

Vermilion Local School District

Course of Study

K-12 Science



Adopted July, 2023

VLSD Board of Education

Courses of study are created and adopted in accordance with VLSD policies listed below:

PO 2141-Assessment of Educational Resources

PO 2210-Curriculum Development

PO 2220-Adoption of Courses of Study

PO 2510-Adoption of Textbooks

PO 2520-Selection of Instructional Materials and Equipment

PO 2623-Student Assessment and Academic Intervention Services

This course of study is current as of the date above and is subject to change due to varying policy, law or curriculum material availability. Instructional unit sequence and length within classes is approximate and subject to change.

Science - Kindergarten

Vermilion Local School District

UNITS (4/4 SELECTED)		SUGGESTED DURATION
<div></div> Unit 1: Aug. Sept. Oct		5 lessons
<div></div> Unit 2: Nov. Dec. Jan		5 lessons
<div></div> Unit 3: Unit 3 Feb, March		1 lessons
<div></div> Unit 4: April, May, June		1 lessons

Unit 1: Aug. Sept. Oct

Science - Kindergarten - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- 1 Fall/Autumn
- 2 Johnny Appleseed
- 3 Apple Sink or Float
4. Apples
5. Families
6. Fire Safety
7. Pumpkins
8. Pumpkins Sink or Float
9. Bats
10. Spiders
11. Halloween
12. Three Stages of water

Unit 1: Aug. Sept. Oct

Science - Kindergarten - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- 1 Projects. Scholastic reader, videos, discussion, books, field trip,
- 2 Field trip. Project, books,
- 3 Science experiment-use words-experiment, prediction. Cut open an apple to show air cavity at the core. I also let the kids toss in other objects that have air or not to observe the sink(marbles, cotton ball etc)
- 4 Field trip, project, discussion, taste testing (3 skin colors-red, yellow, green), make applesauce, hands on, paint with apples (observe the star), make a pie in the crook-pot

- 1 Projects. Scholastic reader, videos, discussion, books, field trip,
- 2 Field trip. Project, books,
- 3 Science experiment-use words-experiment, prediction. Cut open an apple to show air cavity at the core. I also let the kids toss in other objects that have air or not to observe the sink(marbles, cotton ball etc)
- 4 Field trip, project, discussion, taste testing (3 skin colors-red, yellow, green), make applesauce, hands on, paint with apples (observe the star), make a pie in the crook-pot
- 5 Star of the week , each week 1 student

- 6 Field trip to fire station, projects, books, videos, Scholastic News
- 7 Hands on exploration, projects, books,videos, field trip, Scholastic News, graphic organizer ,pumpkin life cycle project, pumpkin label project, little book project with products of a pumpkin, books
- 8 Make predictions, use science vocabulary, recall apple sink or float
- 9 Little book project, books, videos, Scholastic News, build a graphic organizer, label body parts (plastic bat on paper)
project-
- 10 2 body part, 8 legs, 8 eyes-count the parts, fact book project, books , Scholastic News, graphic organizer, decodable book, label the parts
- 11 Books, video, book projects, Scholastic News,

Unit 1: Aug. Sept. Oct

Science - Kindergarten - Last Updated on June 30, 2023

12 Frozen witches hand-solid, liquid gas, freeze colored water with Halloween objects-witches fingers in a clear plastic glove Let the frozen hand sit at room temp all day-observe the change to liquid, use hot pot to boil water to observe the gas

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- 1 Student will be able to discuss weather changes, clothing changes, nature changes for the season of Autumn
- 2 Student will be able to discuss key ideas of John Chapmans life/folklore
- 3 will be able to make predictions if an apple will float/sink in water
- 4 Student will be able to label parts of an apple(stem, leaf, skin, flesh, seed). Sequence ws with apple pie making
- 5 Student will be able to discuss specific likes(food, toy, book, color, drink, hobby) and talk about a photograph of the family supplied by the family
- 6 Student will be to discuss
Fire safety and prevention
- 7 Student will be able to name the parts of a pumpkin and discuss the life cycle as well of knowledge of what is needed for a plant to grow
- 8 Student will be able to state their prediction
- 9 Student will be label the parts of a bat(head, thumb, wing, head)
- 10 Student will be able facts about a spider
- 11 Student will be able to recognize that Halloween is a holiday not a month
- 12 Student will be able to name the three stages of water

Unit 1: Aug. Sept. Oct

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SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

1 Observation, projects, discussion, Autumn painting, Autumn leaf collection

2 Johnny Appleseed project Book

3 Observation, sink or float worksheet

4 Apple label project, discussion

5 observation/discussion

6 Completion of project(little book with facts), discussion

7 Completion of projects, class discussion

8 Observation/discussion

9 Completion of project

10 Observation/discussion, completion of project

11 Discussion

12 Discussion/Observation

STANDARDS

Unit 2: Nov. Dec. Jan

Science - Kindergarten - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1 Owls/Nocturnal Animals

2 Turkeys

3 Thanksgiving

4 Life long ago

5 Pilgrims

6 Holidays Around the World

7 Hannukah

8 New Year

9 Winter

10 Snow

11 Polar Animals

12 Blubber(Crisco)/Ice Water experiment

13 Hibernation

Unit 2: Nov. Dec. Jan

Science - Kindergarten - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- 1 Books, videos, projects, dissect an owl pellet, Smartboard presentation, graphic organizer, label parts of an owl
- 2 Projects, books, Smartboard presentation, Scholastic News, videos, label parts worksheet, show turkey feather and compare to feathers of local birds
- 3 Books, feast in the room, projects, videos,
- 4 Books, videos, Scholastic News, worksheet/project of pics for the past versus current picture comparison (write with pen or feather/ink), pocket chart sorting pics.
- 5 Books, videos, Scholastic News, project
- 6 Videos, projects, books, Scholastic News, project book with one page for several December holidays
- 7 Books, videos, dreidel, menorah project
- 8 Scholastic, projects, books, project, label Jan, calendar-date, year
- 9 Scholastic, projects, books, projects-Peter-, videos, pocket chart sort
- 10 Scholastic, projects, books, centers, catch snow on black felt-look at details, borax crystal snowflakes, thermometer use
- 11 Scholastic News, projects, books, use of a globe-Vocab-Arctic, Antarctica, equator, Northpole, Southpole
- 12 Ice water in a bucket, student one hand in glove with crisco other hand no protection, feel the difference
- 13 Scholastic, projects, books, send home project-chose animal that hibernates and write a sentence and illustrate

Unit 2: Nov. Dec. Jan

Science - Kindergarten - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- 1 Student will be able to discuss facts about owls.
- 2 Student will be able to discuss facts about turkeys
- 3 Student will be able to verbalize/illustrate something they are grateful for
- 4 Student will to correctly differentiate pictures that depict the past versus current (car versus wagon)
- 5 Student will understand that people came to our country from another to start a new life
- 6/7 will understand that there many holidays to celebrate
- 8 Student will understand that the year is a 12 month cycle and January is month number 1
- 9 Student will be able to sort pictures that belong in the winter group
- 10 Student will be able to discuss why is snows- Water in cloud/cold air, understand how temp. Is on a numberline-higher the number the warmer the arm feels
- 11 Student will be able to name 2-3 polar animals, discuss predator, prey, camouflage,
- 12 Student will be able to understand how the blubber (fat) protects the animal from the cold.
- 13 Student will be able to discuss their animal and tell a fun fact. Student will also discuss why the animal hibernates.

Unit 2: Nov. Dec. Jan

Science - Kindergarten - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?



- 1 Completion of label project /discussion
- 2 Discussion and completion of labeling project
- 3 Illustration of what student is grateful for
- 4 Completion of past versus present project. Participation in pocket chart activity
- 5 Discussion
- 6 Completion of book project and participation in class discussion
- 7 Class discussion on various aspects of the jewish holiday
- 8 Class discussion and completion of the month calendar
- 9 Pocket chart sort observation
- 10 Class discussion
- 11 Class discussion
- 12 1:1 discussion when hands in the bucket
- 13 Listen to student give their report

STANDARDS

Unit 3: Unit 3 Feb, March

Science - Kindergarten - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- 1 Groundhogs
- 2 Dental Health
- 3 Hard boiled egg in various liquids
- 4 Penguins
- 5 Science experiment
- 6 Presidents
- 7 Black History
- 8 100th Day of school
- 9 Dr. Seuss
- 10 Weather
- 11 Cloud /rain in a cup
- 12 St. Pats
- 13 Spring
- 14 Rainbow with prism
- 15 Traveling Rainbow
- 16 Space(Moon, Sun, stars, Earth)

Unit 3: Unit 3 Feb, March

Science - Kindergarten - *Last Updated on June 30, 2023*

Unit 3: Unit 3 Feb, March

Science - Kindergarten - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- 1 Video, graphic organizer, books, projects, vocabulary-shadow, map to show where PA and OH
- 2 Dental Hygienist in the classroom for presentation, books, videos, projects
- 3 Science experiment. Compare shell of egg to enamel of teeth. Vocabulary-enamel, porous
- 4 Videos, projects, books, graphic organizer, penguin egg on feet and try to walk, picture next to full size penguin
- 5 Vaseline on Penguin paper and then water on paper and another penguin with no Vaseline. Observe the water ball up and not soak in
- 6 Videos, Scholastic News, books, Wonders (Ana Goes to Washington DC), projects,
- 7 Scholastic, projects, books (Ruby Bridges/Rosa Parks)
- 8 Books, projects, counting Hershey Kisses and placing on poster board-matching numbers, 100 FruitLoops on a necklace, base ten blocks, 100 Red Solo Cups stacking, 100 worksheet
- 9 Books, videos, projects,scramble eggs and ham, reading celebration week,
- 10 Scholastic, projects, books, tornado in a 2 liter, weather tracking Lion/Lamb days, books, pocket chart clothes/symbol match
- 11 Student will put shaving cream in a clear cup. Student will use a pipette properly and drop blue food colored water on the shaving cream. The shaving cream will become heavy and "rain" will fall from the cloud

Unit 3: Unit 3 Feb, March

Science - Kindergarten - Last Updated on June 30, 2023

12 Books, videos, projects, party-how to catch a leprechaun trap, chocolate golden coins

13 Scholastic news, Bookfix, projects, graphic organizer, pocket chart matching, calendar

14 Science experiment also show video, use prism and flashlight to show the rainbow

15 Science Experiment-use clear containers -place primary color food color in each jar-place paper towels connecting each jar

16 Scholastic, projects, books, videos, magnets, Gail Gibbons kit,

Unit 3: Unit 3 Feb, March

Science - Kindergarten - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- 1 Student will be able to find Ohio and neighbor PA and discuss facts about a Groundhog
- 2 Student will be able to discuss how to keep our teeth healthy
- 3 Student will be able to discuss the experiment.
- 4 Student will be able to discuss and verbalize a fact about penguins
- 5 Student will be able to verbalize that penguins have an oil on their feathers which allows them to be waterproof
- 6 Student will be able to verbalize a fact about the president of the US.
- 7 Student will be able to discuss how we are all the same but may look different
- 8 Student will be able to recognize the number 100
- 9 Student will be able to the same author wrote many children's books
- 10 Student will be able to discuss the types of weather
- 11 Student will be able to understand the premise of a heavy water filled cloud will at point will become heavy enough that water will fall
- 12 Student will be able to understand St. Pats day is a holiday not a month or season.
- 13 Student will be able to understand that Spring is a season
- 14 Student will understand that the same colors are in the same order in a rainbow
- 15 Student will be able to name the three primary colors
- 16 Student will be able to name some fun facts about the Sun, Moon

Unit 3: Unit 3 Feb, March

Science - Kindergarten - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- 1 Class discussion
- 2 Discussion and completion of project
- 3 Discussion
- 4 Discussion, understanding of project
- 5 Class discussion
- 6 Class discussion
- 7 Class discussion
- 8 Class participation
- 9 Class discussion
- 10 Same
- 11 Participation in the experiment
- 12 Class discussion
- 13 Class discussion
- 14 Class discussion
- 15 Discussion of the experiment
- 16 Class discussion

STANDARDS

Unit 4: April, May, June

Science - Kindergarten - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1 Farm

2 Ocean

3 Earth Day

4 Plants

5 Bee pollination project
Science

6 Grow/sprout beans
Science

7 Insects/Butterflies

8 Frogs

9 Zoo

10 Summer Safety

Unit 4: April, May, June

Science - Kindergarten - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- 1 Scholastic, projects, books, animals, videos, graphic organizer-building, animals, tools on a farm, possible field trip
- 2 Scholastic, projects, books, field trip to Greater Cleveland Aquarium , graphic organizer, sensory bin
- 3 Project, graphic organizer, books
- 4 Scholastic, projects, books, graphic organizer, pocket chart
- 5 Cheetos-pipe cleaner
- 6 Place seed in plastic bag with wet paper towel, place in window-observe roots and sprout, leaves
- 7 Caterpillars-butterflies science in the classroom
Ant Farm, projects, graphic organizer, books, pocket chart matching
- 8 Tadpoles in the classroom-observe , graphic organizer, Gail Gibbons -life cycle, books, videos, projects(life cycle)
- 9 Possible field trip to Osborne Park- Sandusky , books, graphic organizer, projects,
- 10 Scholastic, projects, books, graphic organizer

Unit 4: April, May, June

Science - Kindergarten - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- 1 Student will be able to discuss items on a farm and use of the items
- 2 Student will be able to discuss that fresh water and saltwater are diff. Habitats with different animals
- 3 Student will be able to discuss how to keep Earth healthy
- 4 Student will be able to discuss what is needed for a plant to grow
- 5 Student will be able to discuss that a bee needs to pollinate for a flower to grow
- 6 Student will be able to discuss the parts of a plant
- 7 Student will be able to name the characteristics of an insect (3 body part, six legs, possible antennae,)
- 8 Student will be able to discuss the life cycle of a frog
- 9 Students will understand that animals are brought to a zoo , they would not live there- discuss habitats and animals
- 10 Student will be able to discuss summer safety

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

1 Class discussion
2 Class discussion
3 Class discussion
4 Class discussion
5 Class discussion
6 Class discussion
7 Class discussion
8 Class discussion
9 Class discussion and completion of project
10 Class discussion

STANDARDS

Science - 1st grade

Vermilion Local School District

UNITS (9/9 SELECTED)		SUGGESTED DURATION
<div></div> Unit 1: September		5 lessons
<div></div> Unit 2: October		1 lessons
<div></div> Unit 3: November		1 lessons
<div></div> Unit 4: December		1 lessons
<div></div> Unit 5: January		1 lessons
<div></div> Unit 6: February		1 lessons
<div></div> Unit 7: March		1 lessons
<div></div> Unit 8: April		1 lessons
<div></div> Unit 9: May		1 lessons

Unit 1: September

Science - 1st grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Classroom/school rules,
Citizenship,
Weather, Seasons,

STANDARDS

Ohio - Grade 1 - Social Studies
1.8.
Individuals have responsibility to take action toward the achievement of common goals in homes, schools and communities and are accountable for those actions.
1.1.
Time can be divided into categories (e.g., months of the year, past, present and future).
1.10.
Rules exist in different settings. The principles of fairness should guide rules and the consequences for breaking rules.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Projects, Read Alouds, Scholastic News, Decodable Booklets, Weather portion of Math Meeting

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will understand concepts and will be able to orally state rules, seasons, etc...

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, Informal Assessments

STANDARDS

Ohio - Grade 1 - Social Studies
1.1.
Time can be divided into categories (e.g., months of the year, past, present and future).
1.2.
Photographs, letters, artifacts and books can be used to learn about the past.
1.3.
The ways basic human needs are met have changed over time.

Unit 1: September

Science - 1st grade - Last Updated on June 30, 2023

1.4.
Maps can be used to locate and identify places.
1.5.
Places are distinctive because of their physical characteristics (land forms and bodies of water) and human characteristics (structures built by people).
1.6.
Families interact with the physical environment differently in different times and places.
1.7.
Diverse cultural practices address basic human needs in various ways and may change over time
1.8.
Individuals have responsibility to take action toward the achievement of common goals in homes, schools and communities and are accountable for those actions.
1.9.
Collaboration requires group members to respect the rights and opinions of others.
1.10.
Rules exist in different settings. The principles of fairness should guide rules and the consequences for breaking rules.
1.11.
Wants are unlimited and resources are limited. Individuals make choices because they cannot have everything they want.
1.12.
People produce and consume goods and services in the community.
1.13.
People trade to obtain goods and services they want.
1.14.
Currency is used as a means of economic exchange.

Unit 1: September

Science - 1st grade - Last Updated on June 30, 2023

Ohio - Grade 1 - Science
ESS.1.
The sun is the principal source of energy.
ESS.2.
The physical properties of water change.
PS.1.
Properties of objects and materials can change.
PS.2.
Objects can be moved in a variety of ways, such as straight, zigzag, circular and back and forth.
LS.1.
Living things have basic needs, which are met by obtaining materials from the physical environment.
LS.2.
Living things survive only in environments that meet their needs.

Unit 2: October

Science - 1st grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Fall, Halloween, Pumpkin Life Cycle, Tree/plant Life Cycle, Animal life

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Projects, Read Alouds, Scholastic News, Decodable Booklets, Weather portion of Math Meeting

STANDARDS

Ohio - Grade 1 - Science
LS.2.
Living things survive only in environments that meet their needs.
LS.1.
Living things have basic needs, which are met by obtaining materials from the physical environment.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will understand concepts and will be able to state facts about all topics

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, Informal Assessments

STANDARDS

Ohio - Grade 1 - Social Studies
1.8.
Individuals have responsibility to take action toward the achievement of common goals in homes, schools and communities and are accountable for those actions.

Unit 3: November

Science - 1st grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Thanksgiving/Pilgrim Life, Election Day, Veterans Day, Autumn,

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Projects, Read Alouds, Scholastic News, Decodable Booklets, Weather portion of Math Meeting, games, graphic organizers

STANDARDS

Ohio - Grade 1 - Science
PS.1.
Properties of objects and materials can change.
LS.1.
Living things have basic needs, which are met by obtaining materials from the physical environment.
LS.2.
Living things survive only in environments that meet their needs.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will understand concepts and will be able to orally state facts about all topics

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, Informal Assessments

STANDARDS

Unit 4: December

Science - 1st grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Christmas/Hanukkah/Kwanzaa/New Year's, Weather, Reindeer study, Needs/wants,

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Projects, Read Alouds, Scholastic News, Decodable Booklets, Weather portion of Math Meeting, games, graphic organizers

STANDARDS

Ohio - Grade 1 - Science
LS.1.
Living things have basic needs, which are met by obtaining materials from the physical environment.
LS.2.
Living things survive only in environments that meet their needs.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will understand concepts and will be able to orally state facts about all topics

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, Informal Assessments

STANDARDS

Unit 5: January

Science - 1st grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Martin Luther King, Jr., Weather, Winter, Hibernation, Arctic Animals, Snowmen

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Projects, Read Alouds, Scholastic News, Decodable Booklets, Weather portion of Math Meeting

STANDARDS

Ohio - Grade 1 - Science
LS.1.
Living things have basic needs, which are met by obtaining materials from the physical environment.
LS.2.
Living things survive only in environments that meet their needs.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will understand concepts and will be able to orally state facts about all topics

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, Informal Assessments

STANDARDS

Unit 6: February

Science - 1st grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Groundhog Day/animal study, Valentine's Day, President's Day, Weather, Black history month, Maps

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Projects, Read Alouds, Scholastic News, Decodable Booklets, Weather portion of Math Meeting

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will understand concepts and will be able to orally state facts about all topics

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, Informal Assessments

STANDARDS

Unit 7: March

Science - 1st grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Time change - science, St. Patrick's Day, Spring, Weather, Plant life cycle,

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Projects, Read Alouds, Scholastic News, Decodable Booklets, Weather portion of Math Meeting

STANDARDS

Ohio - Grade 1 - Science
LS.2.
Living things survive only in environments that meet their needs.
LS.1.
Living things have basic needs, which are met by obtaining materials from the physical environment.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will understand concepts and will be able to orally state facts about all topics

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, Informal Assessments

STANDARDS

Unit 8: April

Science - 1st grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Easter, Rabbit study, Earth day - responsibility, recycle, Spring, animals that hatch/eggs, Weather,

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Projects, Read Alouds, Scholastic News, Decodable Booklets, Weather portion of Math Meeting

STANDARDS

Ohio - Grade 1 - Science
LS.2.
Living things survive only in environments that meet their needs.
LS.1.
Living things have basic needs, which are met by obtaining materials from the physical environment.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will understand concepts and will be able to orally state facts about all topics

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, Informal Assessments

STANDARDS

Unit 9: May

Science - 1st grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Mother's Day, American & Ohio symbols, Fish/Ocean animal study, Matter, Butterfly life cycle

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Projects, Read Alouds, Scholastic News, Decodable Booklets, Weather portion of Math Meeting

STANDARDS

Ohio - Grade 1 - Science
LS.2.
Living things survive only in environments that meet their needs.
LS.1.
Living things have basic needs, which are met by obtaining materials from the physical environment.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will understand concepts and will be able to orally state facts about all topics

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, Informal Assessments

STANDARDS

Science - 2nd grade

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
<div></div> Unit 1: Bailey-Science/Social Studies September	5 lessons
<div></div> Unit 2: Bailey-Science/Social Studies October	1 lessons
<div></div> Unit 3: Bailey-Science/Social Studies November	1 lessons
<div></div> Unit 4: Bailey-Science/Social Studies December	1 lessons
<div></div> Unit 5: Bailey-Science/Social Studies January	1 lessons
<div></div> Unit 6: Bailey-Science/Social Studies February	1 lessons
<div></div> Unit 7: Bailey-Science/Social Studies March	1 lessons
<div></div> Unit 8: Bailey-Science/Social Studies April	1 lessons
<div></div> Unit 9: Bailey-Science/Social Studies May	1 lessons

Unit 1: Bailey-Science/Social Studies September

Science - 2nd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Citizenship

Good character

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Story books and classroom discussions.

Educational videos to describe good character.

Role play good and bad character with the students.

Students complete the good character flipbook.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Respect for the rights of self and others includes making responsible choices and being accountable for personal actions.

There are different rules and laws that govern behavior in different settings.

Groups are accountable for choices they make and actions they take.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation

Exit ticket

Good character flipbook

STANDARDS

Unit 2: Bailey-Science/Social Studies October

Science - 2nd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Map Skills

Timelines

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

BrainpopJr instructional video.

Classroom discussions

Making treasure map

Instructional video about timelines. Make a timeline as a whole group.

Timeline of cedar point

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Maps and their symbols, including cardinal directions, can be interpreted to answer questions about location of places.

Time can be shown graphically on calendars and timelines.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Map Skills Booklet

Classroom Observation

Brainpop quiz

Timeline assessment

STANDARDS

Unit 3: Bailey-Science/Social Studies November

Science - 2nd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Earth Changes-Slow and Fast

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Mystery science
- Instructional videos about earth changes as a visual to students.
- Whole group read Large Science Book together
- Have students complete the fill in the blank worksheet over important topics in the book.
- Cut and paste of earth changes.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Long- and short-term weather changes occur due to changes in energy.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Worksheets
Classroom Observation

STANDARDS

Unit 4: Bailey-Science/Social Studies December

Science - 2nd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Plants and Habitats

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Instructional videos and classroom discussion.

Students work in small groups and research a habitat and make a poster to share with the class.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to tell the difference in habitats.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Worksheets-Cut/paste

Poster

STANDARDS

Unit 5: Bailey-Science/Social Studies January

Science - 2nd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Finish habitats

Begin President/Government discussion

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Finish habitat projects.

-Brainpopjr

-Instructional videos

-Classroom discussions about government, the presidents and what coins and dollars they are on. The job of the president and congress. --Worksheets and cut/paste activities to help learn the concepts.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to tell the difference in habitats.

There are different rules and laws that govern behavior in different settings.

Biographies can show how people's actions shape the world in which we live.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Worksheets

Brainpop quizzes

STANDARDS

Unit 6: Bailey-Science/Social Studies February

Science - 2nd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Finish Presidents

Start Economics

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Brainpopjr

Instructional videos

Classroom discussions about government, the presidents and what coins and dollars they are on. The job of the president and congress. Worksheets and cut/paste activities to help learn the concepts.

Discussion how about goods and services. Complete worksheet.

Talk about Market Day and how students will earn money and make creations to sell to the other students.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Most people around the world work in jobs in which they produce specific goods and services

People use money to buy and sell goods and services.

People earn income by working.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Market Day

STANDARDS

Unit 7: Bailey-Science/Social Studies March

Science - 2nd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Market Day

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Working towards Market day. Making creations. Deciding on pricing for the objects.

The money earned from good behavior will be used to purchase other students' creations on Market Day.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Most people around the world work in jobs in which they produce specific goods and services

People use money to buy and sell goods and services.

People earn income by working.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Market Day Rubric

STANDARDS

Unit 8: Bailey-Science/Social Studies April

Science - 2nd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Weather

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Google slides-weather

Google Slides-weather tools

Partner work

Made an anemometer to take outside to test out

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

The atmosphere is primarily made up of air. Water is present in the atmosphere.

Long- and short-term weather changes occur due to changes in energy.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Google slides

Worksheets

Classroom observation

STANDARDS

Unit 9: Bailey-Science/Social Studies May

Science - 2nd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Weather

Solar System

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Weather craft
Project
Worksheet
Discussions

Teaching about each planet and the sun. Instructional videos about each

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

The atmosphere is primarily made up of air. Water is present in the atmosphere.
Long- and short-term weather changes occur due to changes in energy.

The atmosphere is primarily made up of air. Water is present in the atmosphere.
Long- and short-term weather changes occur due to changes in energy.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Solar System booklet
Worksheets
Classroom observation

STANDARDS

Science - 3rd grade

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
<div></div> Unit 1: September	1 lessons
<div></div> Unit 2: October	5 lessons
<div></div> Unit 3: November	1 lessons
<div></div> Unit 4: December	1 lessons
<div></div> Unit 5: January	1 lessons
<div></div> Unit 6: February	1 lessons
<div></div> Unit 7: March	1 lessons
<div></div> Unit 8: April	1 lessons
<div></div> Unit 9: May	1 lessons

Unit 1: September

Science - 3rd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Civic Participation

Earth Science

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Videos, Books, Group Collaboration, Worksheets from Education.com/Teachers Pay Teacher
Nearpod on Natural Resources, Brain Pop video

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Members of local communities have rights and responsibilities.

Individuals make the community a better place by taking action to solve problems in a way that promotes the common good

Some of Earth's resources become limited due to overuse and/or contamination.

Reducing resource use, decreasing waste and/or pollution, recycling and reusing can help conserve these resources

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Completed What is a Citizen sheet

Completed activities in Nearpod

STANDARDS

Unit 2: October

Science - 3rd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Earth Science

Geography

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Rock and soil hands-on materials, online videos, worksheets from Education.com

Brainpop video, map skills worksheets from TPT, Mystery Skype with other classes (cont. throughout the year)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Soil is composed of pieces of rock, organic material, water and air and has characteristics that can be measured and observed. Use the term “soil”, not “dirt”.

Dirt and soils are not synonymous.

Rocks have specific characteristics that allow them to be sorted and compared. Rocks form in different ways. Air and water are also nonliving resources.

Rocks have specific characteristics that allow them to be sorted and compared. Rocks form in different ways. Air and water are also nonliving resources

Physical and political maps have distinctive characteristics and purposes. Places can be located on a map by using the title, key, alphanumeric grid and cardinal directions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

“Match the Rocks”

“Types of Soil”

“Our Neighborhood” mapping sheet, “Campground” grid mapping, and “Make a Playground” activity

STANDARDS

Unit 3: November

Science - 3rd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Government, Rules and Law

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Brainpop videos, TPT levels of government flip book, write letters to Mayor Fortthofer

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Governments have authority to make and enforce laws.

The structure of local governments may differ from one community to another.

Laws are rules which apply to all people in a community and describe ways people are expected to behave. Laws promote order and security, provide public services and protect the rights of individuals in the local community

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Government quiz

STANDARDS

Unit 4: December

Science - 3rd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Earth Science

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Energy Sources video on Brainpop Jr, Renewable/Non Renewable Energy Flip Book, Energy Mystery Science

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Renewable energy resources, such as wind, water or solar energy, can be replenished within a short amount of time by natural processes. Nonrenewable energy is a finite resource, such as natural gas, coal or oil, which cannot be replenished in a short amount of time.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Energy Plan from Energy Mystery Science

STANDARDS

Unit 5: January

Science - 3rd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Physical Science

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Brainpop Jr. videos, Teachers Pay Teachers resources, states of matter slides project, hands on activities with snow, water, and water vapor, Water Cycle and Phases of Matter Mystery Science

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

All objects and substances in the natural world are composed of matter.

Matter exists in different states, each of which has different properties.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

States of Matter Quiz (Google Forms)

STANDARDS

Unit 6: February

Science - 3rd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Physical Science

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Brainpop Jr. videos, Teachers Pay Teachers resources, states of matter slides project, hands on activities with snow, water, and water vapor, Water Cycle and Phases of Matter Mystery Science

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

All objects and substances in the natural world are composed of matter.

Matter exists in different states, each of which has different properties.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

States of Matter Quiz (Google Forms)

STANDARDS

Unit 7: March

Science - 3rd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

History

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Local communities change overtime.

Events in local history can be shown on timelines organized by years, decades and centuries.

Primary and secondary sources can be used to show change over time

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

STANDARDS

Unit 8: April

Science - 3rd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Economics

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teachers Pay Teachers Economics Unit with accompanying texts

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Both positive and negative incentives affect individuals' choices and behaviors.

Individuals must make decisions because of the scarcity of resources. Making a decision involves a trade-off.

A consumer is a person whose wants are satisfied by using goods and services. A producer makes goods and/or provides services.

A market is where buyers and sellers exchange goods and services.

Making decisions involves weighing costs and benefits.

A budget is a plan to help people make personal economic decisions for the present and future and to become more financially responsible.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Economics Check-Ups

STANDARDS

Unit 9: May

Science - 3rd grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Life Science

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

animal report notes, brainpop videos on classifying animals, food chain, habitats, zoo websites, research websites including Duckster, Kid Rex

Plant life cycle and plant adaptations videos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Offspring resemble their parents and each other

Individuals of the same kind of organism differ in their inherited traits. These differences give some individuals an advantage in surviving and/or reproducing.

Plants and animals have life cycles that are part of their adaptations for survival in their natural environments

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Completed Animal Report, Google Slides

STANDARDS

Science - 4th grade

Vermilion Local School District

UNITS (6/6 SELECTED)		SUGGESTED DURATION
 Unit 1: Studying Science		20 lessons
 Unit 2: Earth's surface		20 lessons
 Unit 3: Earth's Living History		10 lessons
 Unit 4: Matter		10 lessons
 Unit 5: Electricity		15 lessons
 Unit 6: Living things and their environments		20 lessons

Unit 1: Studying Science

Science - 4th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

What do Scientist do?

Scientific method

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

interactive textbook questions

experiments (paper teacher, ball bouncing, paper airplane)

Scientific method steps video and songs

brain pop video and generation genius videos

kahoots

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

students will be able to list the steps in the scientific method

ATTACHMENTS

 ScientificMethodWorksheetSkittlesGraphingScienceExperiment.pdf

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

quiz over the scientific method

kahoot score

experiment completion sheet

STANDARDS

Unit 2: Earth's surface

Science - 4th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Water cycle
weathering and erosion and deposition
changes to earth's surface

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

interactive workbook
generation genius and brainpop
experiments with play doh
songs and dances to learn water cycle and weathering erosion and deposition

ATTACHMENTS

 Landforms_Study_Guide.pdf

 water_cycle_directions.pages

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to name the steps of the water cycle
Students will be able to identify weathering erosion and deposition in landforms

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

quizzes over water cycle and weathering erosion and deposition
exit ticket
experiment sheets completions

STANDARDS

Ohio - Grade 4 - Science	
ESS.1.	
Earth's surface has specific characteristics and landforms that can be identified.	
ESS.2.	
The surface of Earth changes due to weathering.	
ESS.3.	

Unit 2: Earth's surface

Science - 4th grade - Last Updated on June 30, 2023

The surface of Earth changes due to erosion and deposition.

Unit 3: Earth's Living History

Science - 4th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

what are fossils
what was ancient earth like
how do scientist use fossils

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

brainpop video and generation genius
interactive worktext
virtual lab
make our own salt doh (fossil creations)
mystery science (identifying dinosaurs--meat or plant eater) lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to identify fossils

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

lesson quizzes
assessment guide
unit review

STANDARDS

Ohio - Grade 4 - Science

LS.2.

Fossils can be compared to one another and to present day organisms according to their similarities and differences.

LS.1.

Changes in an organism's environment are sometimes beneficial to its survival and sometimes harmful.

Unit 4: Matter

Science - 4th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solids, liquids and gases
how does water change
how does matter change
mixtures and solutions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

interactive textbook
experiments with solids, liquid, and gases
making of trail mix (mixtures) and koolaid (solutions)
generation genius video
virtual lab (online resource)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to explain the difference between mixture and solution and give an example
Students will be able to identify solid, liquid and gases
Students will be able to show how matter changes

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

lesson quiz
student review
sum it up and brain check
experiment sheet completion

STANDARDS

Ohio - Grade 4 - Science

PS.1.

The total amount of matter is conserved when it undergoes a change.

Unit 5: Electricity

Science - 4th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

How do electrical charges interact?

What is an electric circuit?

What are circuits, conductors and insulators?

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

virtual lab

light bulb circuits creation using batteries and lightbulbs

interactive textbooks

different circuits construction

creating insulators and conductors

ATTACHMENTS

 Electricity_Study_Guide_copy.pages

 online_electricity_activities.pages

 how_a_light_bulb_works.pdf

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to identify difference between insulators, conductors, and circuits

Students will be able to tell difference between parallel and series circuits

Students will be able to create a circuit

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

assessment guide

lesson quizzes

circuit completion

STANDARDS

Ohio - Grade 4 - Science

PS.2.

Energy can be transformed from one form to another or can be transferred from one location to another.

Unit 6: Living things and their environments

Science - 4th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

How living organisms are adapted to live in specific environments.

Changes to environments affect an organisms survival

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

reading the interactive Fusion textbook

watching videos on environments (generation genius)

partner work and inquiry of how bird's beaks differ and why

vocabulary words and note taking

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to how livings things can adapted to their environment.

Students will be able to identify how environments changes affect organisms.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Fusion quizzes

Kahoot scores

worksheet completions

STANDARDS

Ohio - Grade 4 - Science

LS.1.

Changes in an organism's environment are sometimes beneficial to its survival and sometimes harmful.

Science - 5th grade

Vermilion Local School District

UNITS (6/6 SELECTED)	SUGGESTED DURATION
<div></div> Unit 1: Scientific Method and Inquiry	7 lessons
<div></div> Unit 2: Ecosystems	20 lessons
<div></div> Unit 3: Solar System	10 lessons
<div></div> Unit 4: Sound	10 lessons
<div></div> Unit 5: Light	10 lessons
<div></div> Unit 6: Force and Motion	10 lessons

Unit 1: Scientific Method and Inquiry

Science - 5th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Scientific Method and Inquiry Essential Topics:

1. What is Science?
2. How Do Scientists Learn About the Natural World?
3. What Are Some Types of Investigation
4. How Do You Perform a Controlled Experiment?
5. How Can Scientists Learn from Observations?

STANDARDS

Scientific Inquiry and Application
SIA1.0
Identify questions that can be answered through scientific investigations.
SIA2.0
Design and conduct a scientific investigation
SIA3.0
Use appropriate mathematics, tools and techniques to gather data and information.
SIA4.0
Analyze and interpret data.
SIA5.0
Develop descriptions, models, explanations and predictions.
SIA6.0
Think critically and logically to connect evidence and explanations.
SIA7.0
Recognize and analyze alternative explanations and predictions.

Unit 1: Scientific Method and Inquiry

Science - 5th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Delivery of Essential Topic:

1. Direct Inquiry
2. Independent Inquiry
3. Reading, discussions, labs, video clips
 - **Study Jams Video- Scientific Method**
4. Use of student interactive workbook and notebook
5. Labs
 - **Magic Milk Lab**
 - **Paper Towel Variables Lab**

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to:

1. Identifying critical thinking skills and explain how scientists use them during an experiment
2. Analyze, evaluate, and critique scientific investigations
3. Communicate and collaborate during a scientific investigation
4. Write a proper hypothesis and conclusion in a scientific investigation

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Demonstration of learning will be through the following methods:

1. Lesson quizzes including "exit tickets" to check for understanding after lesson delivery
2. Study Jams Video Quiz
3. Unit Test
4. Interactive Notebooks
5. Successfully complete the steps of the scientific method by conducting the following lab(s):
 - **Magic Milk Lab**
 - **Paper Towel Variables Lab**

***All teacher created or purchased interactive notebook pages, quizzes, exit tickets, worksheets, and labs used for 5th grade science are in her google classroom.**

STANDARDS

Unit 2: Ecosystems

Science - 5th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Ecosystem Essential Topics:

1. What is an Ecosystem?
2. What Makes Up a Land Ecosystem?
3. What Are Physical and Behavioral Adaptations?
4. What Role Does An Organism Play in an Ecosystem?
5. Does Energy Move Through Ecosystems?
6. What Role Does a Decomposer Play in an Ecosystem?

STANDARDS

Ohio - Grade 5 - Science
LS.2.
All of the processes that take place within organisms require energy
LS.1.
Organisms perform a variety of roles in an ecosystem.
Scientific Inquiry and Application
SIA1.0
Identify questions that can be answered through scientific investigations.
SIA2.0
Design and conduct a scientific investigation
SIA3.0
Use appropriate mathematics, tools and techniques to gather data and information.
SIA4.0
Analyze and interpret data.
SIA5.0
Develop descriptions, models, explanations and predictions.
SIA6.0
Think critically and logically to connect evidence and explanations.

Unit 2: Ecosystems

Science - 5th grade - Last Updated on June 30, 2023

SIA7.0
Recognize and analyze alternative explanations and predictions.
SIA8.0
Communicate scientific procedures and explanations.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Delivery of Essential Topic:

1. Direct Inquiry
2. Independent Inquiry
3. Reading, discussions, labs, video clips
 - **Study Jams Videos- Ecosystems, Changes in Ecosystems, Food Chains, Food Webs, Symbiosis**
4. Use of student interactive workbook and notebook
5. Hands on labs
 - **Celery Lab**
 - **Sow Bug Lab**
 - **Bird Beak Lab**
 - **Carrying Capacity Lab**
6. Small and large group instruction
7. Outdoor exploration
 - **Field and creek exploration of Saylorway**
8. Field trip
 - **Rocky River Reservation**

Unit 2: Ecosystems

Science - 5th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to:

1. Identify the characteristics of an ecosystem
 - **biotic and abiotic factors within an ecosystem**
 - **types of consumers- carnivore, omnivore, herbivore, scavengers, decomposers**
 - **producers- plants**
2. Explain how organisms interact with living and nonliving things in their ecosystem
3. Students will identify the role of producers and consumers.
 - **classify picture cards of producers and consumers in proper categories**
4. Understand the process of photosynthesis
 - **Sun being the originating source of energy of all living things**
5. Learn how organisms gain energy
6. Understand food webs and food chains
 - **build a food chain with various picture cards of living things**

***Classroom terrarium will be used for observation during the study of ecosystems.**

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Demonstration of learning will be through the following methods:

1. Lesson quizzes
2. Study Jams Quizzes
3. Student workbook pages
4. Teacher created quizzes including "exit tickets" to check for understanding after lesson delivery
5. Unit Test
6. Successfully complete the steps of the scientific method by conducting the following lab(s):
 - **Celery Lab**
 - **Sow Bug Lab**
 - **Bird Beak Lab**
 - **Carrying Capacity Lab**
7. Ecosystem Report/Project
 - **Walking trip to the creek on the back property of Sailorway with students listing all the abiotic and biotic factors in our school environment**
 - **Biome Report**

***All teacher created or purchased interactive notebook pages, quizzes, exit tickets, worksheets, and labs used for 5th grade science are in her google classroom.**

STANDARDS

Unit 3: Solar System

Science - 5th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solar System Essential Topics:

1. How Do the Sun, Earth, and Moon Differ?
2. What Objects Are Part of the Solar System?
3. How Can We Model the Sun and Planets?
4. What Are Stars and Galaxies?

STANDARDS

Ohio - Grade 5 - Science
ESS.1.
The solar system includes the sun and all celestial bodies that orbit the sun. Each planet in the solar system has unique characteristics.
ESS.2.
The sun is one of many stars that exist in the universe.
ESS.3.
Most of the cycles and patterns of motion between the Earth and sun are predictable.
Scientific Inquiry and Application
SIA5.0
Develop descriptions, models, explanations and predictions.
SIA8.0
Communicate scientific procedures and explanations.

Unit 3: Solar System

Science - 5th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Delivery of Essential Topic:

1. Direct Inquiry
2. Independent Inquiry
3. Reading, discussions, labs, video clips
 - **Study Jams Videos- Our Solar System, Inner Planets, Our Solar System, Outer Planets, The Moon, The Universe, A Day on Earth, Gravity and Inertia**
4. Use of student interactive workbook and notebook
5. Hands on and Virtual labs
6. Small and large group instruction

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to:

1. Describe the Earth, sun, and moon system
2. Demonstrate that rotation on Earth's axis causes day and night
3. Identify physical characteristics of the Earth, sun, and moon
4. Identify major components of the solar system
5. Compare and contrast inner and outer planets
6. Describe smaller objects that orbit the sun such as comets, asteroids, meteoroids and dwarf planets
7. Model and compare the size of the Sun and planets as well as comparing the 8 planets in our solar system
8. Explain that stars are very large but appear small because they are far away
9. Explain how to classify a galaxy

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Demonstration of learning will be through the following methods:

1. Lesson quizzes
2. Study Jams Quizzes
3. Student workbook pages
4. Teacher created quizzes including "exit tickets" to check for understanding after lesson delivery
5. Unit Test
6. Project
 - **Design a Spacecraft Project**

***All teacher created or purchased interactive notebook pages, quizzes, exit tickets, worksheets, and labs used for 5th grade science are in her google classroom.**

STANDARDS

Unit 3: Solar System

Science - 5th grade - Last Updated on June 30, 2023

Ohio - Grade 5 - Science
ESS.1.
The solar system includes the sun and all celestial bodies that orbit the sun. Each planet in the solar system has unique characteristics.
ESS.2.
The sun is one of many stars that exist in the universe.
ESS.3.
Most of the cycles and patterns of motion between the Earth and sun are predictable.

Unit 4: Sound

Science - 5th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Sound Essential Topics:

1. What is Sound?
2. How Does Sound Travel Through Solids, Liquids, and Gases?

STANDARDS

Ohio - Grade 5 - Science
PS.2.
Light and sound are forms of energy that behave in predictable ways.
Scientific Inquiry and Application
SIA1.0
Identify questions that can be answered through scientific investigations.
SIA2.0
Design and conduct a scientific investigation
SIA3.0
Use appropriate mathematics, tools and techniques to gather data and information.
SIA4.0
Analyze and interpret data.
SIA5.0
Develop descriptions, models, explanations and predictions.
SIA6.0
Think critically and logically to connect evidence and explanations.
SIA7.0
Recognize and analyze alternative explanations and predictions.
SIA8.0
Communicate scientific procedures and explanations.

Unit 4: Sound

Science - 5th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Delivery of Essential Topic:

1. Direct Inquiry
2. Independent Inquiry
3. Reading, discussions, labs, video clips
 - **Study Jams Video- Sound**
4. Use of student interactive workbook and notebook
5. Hands on and Virtual labs
 - **Sound Center Lab**
6. Small and large group instruction

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to:

1. Recognize that sound travels in waves.
2. Demonstrate that sound is transmitted by vibrations traveling through a medium
3. How is sound energy used

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Demonstration of learning will be through the following methods:

1. Lesson quizzes
2. Unit Test
3. Successfully complete the steps of the scientific method by conducting the following lab(s):
 - **Sound Center Lab**
4. Project
 - **Design your own musical instrument**

***All teacher created or purchased interactive notebook pages, quizzes, exit tickets, worksheets, and labs used for 5th grade science are in her google classroom.**

STANDARDS

Unit 5: Light

Science - 5th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Light Essential Topics:

1. What Are Some Properties of Light?
2. What Happens When Light Is Reflected and Refracted?

STANDARDS

Ohio - Grade 5 - Science
PS.2.
Light and sound are forms of energy that behave in predictable ways.
Scientific Inquiry and Application
SIA1.0
Identify questions that can be answered through scientific investigations.
SIA2.0
Design and conduct a scientific investigation
SIA3.0
Use appropriate mathematics, tools and techniques to gather data and information.
SIA4.0
Analyze and interpret data.
SIA5.0
Develop descriptions, models, explanations and predictions.
SIA6.0
Think critically and logically to connect evidence and explanations.
SIA7.0
Recognize and analyze alternative explanations and predictions.
SIA8.0
Communicate scientific procedures and explanations.

Unit 5: Light

Science - 5th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Delivery of Essential Topic:

1. Direct Inquiry
2. Independent Inquiry
3. Reading, discussions, labs, video clips
 - **Study Jams Video- Light, Light Absorption, Reflection, and Refraction**
4. Use of student interactive workbook and notebook
5. Hands on and Virtual labs
 - **Light Centers Lab**
6. Small and large group instruction

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to:

1. Students will demonstrate that light will travel in a straight line until it strikes an object or travels from one medium to another.
2. Demonstrate that light can be reflected or refracted.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Demonstration of learning will be through the following methods:

1. Lesson quizzes
2. Unit Test
3. Successfully complete the steps of the scientific method by conducting the following lab(s):
 - **Light Center Lab**
 - **Library Walk to identify opaque, translucent, and transparent objects**

***All teacher created or purchased interactive notebook pages, quizzes, exit tickets, worksheets, and labs used for 5th grade science are in her google classroom.**

STANDARDS

Unit 6: Force and Motion

Science - 5th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Force and Motion Essential Topics:

1. What is Motion?
2. What Are Forces?
3. How Do Forces Affect Motion?
4. How Do Gravity and Friction Affect Motion?

STANDARDS

Ohio - Grade 5 - Science
PS.1.
The amount of change in movement of an object is based on the mass of the object and the amount of force exerted.
Scientific Inquiry and Application
SIA1.0
Identify questions that can be answered through scientific investigations.
SIA2.0
Design and conduct a scientific investigation
SIA3.0
Use appropriate mathematics, tools and techniques to gather data and information.
SIA4.0
Analyze and interpret data.
SIA5.0
Develop descriptions, models, explanations and predictions.
SIA6.0
Think critically and logically to connect evidence and explanations.
SIA7.0
Recognize and analyze alternative explanations and predictions.
SIA8.0

Unit 6: Force and Motion

Science - 5th grade - Last Updated on June 30, 2023

Communicate scientific procedures and explanations.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Delivery of Essential Topic:

1. Direct Inquiry
2. Independent Inquiry
3. Reading, discussions, labs, video clips
 - **Study Jams Videos- Force and Motion, Gravity and Inertia, Newton's 1st, 2nd, and 3rd Law**
4. Use of student interactive workbook and notebook
5. Hands on and Virtual labs
 - **Force and Motion Lab- 7 days of a force and motion lab covering various concepts**
 - **Sheep in a Jeep Lab**
6. Small and large group instruction

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to:

1. Students will observe and record changes in position
2. Explain how to measure motion
3. Compare the motion of various objects
4. Describe how velocity and acceleration are related
5. Describe how various forces can affect the motion of an object
6. Experiment on how the mass of an object can affect the motion of an object
7. Identify forces that act on objects in motion, such as gravity and friction

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Demonstration of learning will be through the following methods:

- Lesson quizzes
- Quick Checks after lesson delivery
- Unit Test
- Successfully complete the steps of the scientific method by conducting the following lab(s):
 - **Force and Motion Lab- 7 days of a force and motion lab covering various concepts**
 - **Sheep in a Jeep Lab**

***All teacher created or purchased interactive notebook pages, quizzes, exit tickets, worksheets, and labs used for 5th grade science are in her google classroom.**

STANDARDS

Science - 6th grade

Vermilion Local School District

UNITS (15/15 SELECTED)

 Unit 1: Lab Safety	14 lessons
 Unit 2.1: Skills of Science	3 lessons
 Unit 2.2: Scientists way of scientific thinking	2 lessons
 Unit 2.3: Detailed procedure	3 lessons
 Unit 2.4: Scientific Method and Inquiry	23 lessons
 Unit 3: Measurement in Science	9 lessons
 Unit 4: Minerals	11 lessons
 Unit 5: Rocks	11 lessons
 Unit 6: Rock Cycle	6 lessons
 Unit 7: Soil	6 lessons
 Unit 8: motion	8 lessons
 Unit 9: Energy	18 lessons
 Unit 10: Matter 1	9 lessons
 Unit 11: Matter 2	9 lessons
 Unit 12: Life Science-cells and living things	35 lessons

Unit 1: Lab Safety

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Safety in the Lab

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- [Safety Videos-right way vs wrong way/cringe worthy](#)
- Safety Keynote
- Safety in the lab pages in the book 72-75 blue
- Lab safety project with partners-right way and wrong way

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Identify Safe and Non-safe practices- in a lab.
- Students will be able to complete a lab safely and efficiently avoiding potential accidents

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Quiz over Lab Safety-quizzes
- Lab safety project-right way and wrong way

STANDARDS

Ohio - Grade 6 - Science
SIA.3
Design and conduct a scientific investigation

Unit 2.1: Skills of Science

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Skills of Science
 1. Inference and Prediction
 2. Qualitative and Quantitative Data
 3. Classification

STANDARDS

Ohio - Grade 6 - Science
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.6
Develop descriptions, models, explanations and predictions
SIA.5
Analyze and interpret data
SIA.2
Identify questions that can be answered through scientific investigations
SIA.1
Apply knowledge of science content to real-world challenges.

Unit 2.1: Skills of Science

Science - 6th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

p6-7 Blue book
Chapter 1 vocabulary-worksheet
-Edgenuity-scientific method
-pages in the book pg 5 blue
-notes-copy from video
-videos-writing on the board
-worksheet-shark worksheet
-classroom examples
-pages in book page 7 blue
-NewsELA article
-Classification Lab-outdoor lab
-Edgenuity-scientific method

STANDARDS

Ohio - Grade 6 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

Unit 2.1: Skills of Science

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- students will be able to determine the difference between Inference and Prediction
- Students will be able to distinguish the difference between qualitative and quantitative Data
- Students will be able to correctly classify items based on similar and non-similar characteristics

STANDARDS

Ohio - Grade 6 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

Unit 2.1: Skills of Science

Science - 6th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

-Quiz over All the skills in Science-quizzex

-worksheet identify each

-outdoor lab

-inside classroom (classifying students)

STANDARDS

Ohio - Grade 6 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

STANDARDS

Ohio - Grade 6 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations

Unit 2.1: Skills of Science

Science - 6th grade - Last Updated on June 30, 2023

SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

Unit 2.2: Scientists way of scientific thinking

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Scientists way of scientific thinking

STANDARDS

Ohio - Grade 6 - Science
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- pages in the book 10-17 blue
- articles
- internet research

STANDARDS

Ohio - Grade 6 - Science
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

Unit 2.2: Scientists way of scientific thinking

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-Students will be able to identify ways of scientific thinking and why it's important by studying scientists

STANDARDS

Ohio - Grade 6 - Science
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

-project on scientist based on invention

STANDARDS

Ohio - Grade 6 - Science
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

STANDARDS

Ohio - Grade 6 - Science
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7

Unit 2.2: Scientists way of scientific thinking

Science - 6th grade - Last Updated on June 30, 2023

Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

Unit 2.3: Detailed procedure

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

How to write a good detailed procedure

STANDARDS

Ohio - Grade 6 - Science
SIA.9
Communicate scientific procedures and explanations
SIA.3
Design and conduct a scientific investigation

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- everyday examples-tying shoe
- PBJ example
- Videos-PBJ right/wrong
- Ghost Experiment
- Baggie Experiment
- paper Airplane Experiment

STANDARDS

Ohio - Grade 6 - Science
SIA.9
Communicate scientific procedures and explanations
SIA.3
Design and conduct a scientific investigation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students will be able to write a good detailed procedure that can be followed completely

STANDARDS

Ohio - Grade 6 - Science
SIA.3
Design and conduct a scientific investigation
SIA.9
Communicate scientific procedures and explanations

Unit 2.3: Detailed procedure

Science - 6th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

-writing up detailed procedure for experiments.

STANDARDS

Ohio - Grade 6 - Science
SIA.3
Design and conduct a scientific investigation
SIA.9
Communicate scientific procedures and explanations

STANDARDS

Ohio - Grade 6 - Science
SIA.3
Design and conduct a scientific investigation
SIA.9
Communicate scientific procedures and explanations

Unit 2.4: Scientific Method and Inquiry

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Scientific Method-detailed procedure, variables, constants, hypothesis, conclusions,
- designing and conducting a scientific investigation
- Identify questions that can be answered through scientific investigation
- Think critically and logically to connect evidence and explanations

STANDARDS

Ohio - Grade 6 - Science
SIA.10
Design technological/engineering solutions.
SIA.9
Communicate scientific procedures and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.6
Develop descriptions, models, explanations and predictions
SIA.5
Analyze and interpret data
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.3
Design and conduct a scientific investigation
SIA.2
Identify questions that can be answered through scientific investigations

Unit 2.4: Scientific Method and Inquiry

Science - 6th grade - Last Updated on June 30, 2023

SIA.1
Apply knowledge of science content to real-world challenges.

Unit 2.4: Scientific Method and Inquiry

Science - 6th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Notes IV/DV, hypothesis, constants
- Pages 18-27 Blue
- Blooket-Scientific Method
- Go through using scientific method-strept throat/car keys
- keynote/slides on Sc. Method
- notes/
- Elephant toothpaste exp
- Toothpaste exp
- shampoo exp-clean pennies better
- vinegar/baking soda exp
- skittles exp
- gummy bear experiment
- Sponge bob experiments
- bubble Gum exp
- M&M experiment
- oreos exp
- bottle scuba diver exp
- sharpie marker exp
- Mint Exp
- foam swim fish exp
- fortune teller exp
- NewsELA
- Edgenuity-scientific method
- Mill Hollow Project
- Videos-chemistry video w/notes
- Breakouts-Scientific method
- Saving Sammy gummy wormCopper penny clean exp
- ice melting exp
- sponge absorbency exp
- paper towel absorbency exp
- Alka seltzer exp
- Earth worm exp
- Blooket

STANDARDS

Ohio - Grade 6 - Science
SIA.10
Design technological/engineering solutions.
SIA.9
Communicate scientific procedures and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

Unit 2.4: Scientific Method and Inquiry

Science - 6th grade - Last Updated on June 30, 2023

SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.5
Analyze and interpret data
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.3
Design and conduct a scientific investigation
SIA.2
Identify questions that can be answered through scientific investigations
SIA.1
Apply knowledge of science content to real-world challenges.

Unit 2.4: Scientific Method and Inquiry

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students will be able to design and conduct a scientific investigation, Identify questions that can be answered through scientific investigations, and think critically and logically to connect evidence and explanations.
- Students will be able to identify key science terms in the experiment such as Independent variable, dependent variable, hypothesis, constants and control.

STANDARDS

Ohio - Grade 6 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations
SIA.10

Unit 2.4: Scientific Method and Inquiry

Science - 6th grade - Last Updated on June 30, 2023

Design technological/engineering solutions.

Unit 2.4: Scientific Method and Inquiry

Science - 6th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Write ups on Experiments -identify variables, make a hypothesis, write a detailed procedure, and make a conclusion
- Quiz over the Scientific Method and Scientific Inquiry
- Mill Hollow Project

STANDARDS

Ohio - Grade 6 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations

Unit 2.4: Scientific Method and Inquiry

Science - 6th grade - Last Updated on June 30, 2023

SIA.10

Design technological/engineering solutions.

STANDARDS

Ohio - Grade 6 - Science

SIA.10

Design technological/engineering solutions.

SIA.9

Communicate scientific procedures and explanations

SIA.8

Recognize and analyze alternative explanations and predictions

SIA.7

Think critically and logically to connect evidence and explanations

SIA.6

Develop descriptions, models, explanations and predictions

SIA.5

Analyze and interpret data

SIA.4

Use appropriate mathematics, tools and techniques to gather data and information

SIA.3

Design and conduct a scientific investigation

SIA.2

Identify questions that can be answered through scientific investigations

SIA.1

Apply knowledge of science content to real-world challenges.

Unit 3: Measurement in Science

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Students will learn how to correctly use a ruler to find length, a triple beam balance to find mass, beakers to find volume and use all 3 to find density

STANDARDS

Ohio - Grade 6 - Science
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Little millie metric introduction
- measurement scavenger hunt
- triple beam balance hands on practice
- T.B.B. Video
- mass online practice-[triple beam balance practice](#)
- displacement method using beaker practice
- [Volume meatball assignment](#)
- Legends of learning volume games
- calculating density online
- Blooket-measurement
- Density bottle diver
- Dead sea video/Scrolls Newsela
- golf ball experiment
- density popcorn, ping pong ball, marbles
- Worksheet 5 practice problems
- Pages in the book 38-45 blue
- pages 42-53 red book
- [metric system practice google slides](#)
- Archimedes poster

STANDARDS

Ohio - Grade 6 - Science
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Unit 3: Measurement in Science

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

6.SIA.4

-students will be able to explain how tools and measurements are used in scientific investigations.

-Students will be able to use appropriate Mathematics, tools and techniques to gather data and information

-students will be able to understand the metric system and how to label answers.

STANDARDS

Ohio - Grade 6 - Science
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

-quiz over measurement and the tools that are used

-Metric system practice google slides

STANDARDS

Ohio - Grade 6 - Science
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

STANDARDS

Ohio - Grade 6 - Science
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Unit 4: Minerals

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

-Minerals have specific properties and practical uses

STANDARDS

Ohio - Grade 6 - Science
ESS.1.
Minerals have specific, quantifiable properties.
ESS.5.
Rocks, minerals and soils have common and practical uses.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Emerald Hollow Mine-video
- Mineral Baby
- keynotes-rocks and minerals slides 1-11
- book pages 110-123 Red, Pages 88-99 Blue
- [-Virtual mineral lab](#)
- Edpuzzle Minerals
- [-reading how diamonds are mined](#)
- videos-how to identify a mineral
- notes-as we go on google -magnetic cereal lab
- NewsELA
- project-design your own bling
- Virtual mineral identification lab
- Hands on mineral identification lab
- Cupcake core sampling lab
- mineral scavenger hunt
- mineral booklet
- [-minerals make your house complete](#)
- real story behind plymouth rock

STANDARDS

Ohio - Grade 6 - Science
ESS.1.
Minerals have specific, quantifiable properties.
ESS.5.
Rocks, minerals and soils have common and practical uses.

Unit 4: Minerals

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-Students will be able to describe the basic structure of minerals and identify different minerals by using their physical properties

STANDARDS

Ohio - Grade 6 - Science
ESS.1.
Minerals have specific, quantifiable properties.
ESS.5.
Rocks, minerals and soils have common and practical uses.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- hiddenite north carolina mining video with questions
- Vocabulary
- mineral identification lab
- quiz over minerals
- blooket minerals
- design your own bling
- minerals make your house your home

STANDARDS

Ohio - Grade 6 - Science
ESS.1.
Minerals have specific, quantifiable properties.
ESS.5.
Rocks, minerals and soils have common and practical uses.

STANDARDS

Ohio - Grade 6 - Science
ESS.1.
Minerals have specific, quantifiable properties.
ESS.5.
Rocks, minerals and soils have common and practical uses.

Unit 5: Rocks

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

-Rocks have unique characteristics and form in different ways

STANDARDS

Ohio - Grade 6 - Science

ESS.2.

Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.

ESS.3.

Igneous, metamorphic and sedimentary rocks form in different ways.

ESS.5.

Rocks, minerals and soils have common and practical uses.

Unit 5: Rocks

Science - 6th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- SOLE
- Flip Pages
- book pages 140-153 Red
- Pages 100-117 Blue
- NewsELA
- notes
- articles
- pop rock experiment
- book pages 100-117 Blue
- book pages 140-153 Red
- edgenuity-Myers Rocks
- newsela
- notes
- articles
- flip pages
- videos
- gold mining activity
- chocolate chip cookie mining activity
- Geology kitchen
- Rice Krispie Treat Lab
- Rock Walk
- Rock identification
- Dig it secrets of soil
- Rocks blocket

STANDARDS

Ohio - Grade 6 - Science
ESS.2.
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
ESS.3.
Igneous, metamorphic and sedimentary rocks form in different ways.
ESS.5.
Rocks, minerals and soils have common and practical uses.

Unit 5: Rocks

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

the students will be able to describe the formation and classification of sedimentary , igneous, and metamorphic rock

STANDARDS

Ohio - Grade 6 - Science
ESS.2.
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
ESS.3.
Igneous, metamorphic and sedimentary rocks form in different ways.
ESS.5.
Rocks, minerals and soils have common and practical uses.

Unit 5: Rocks

Science - 6th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- quiz over rocks
- pop rock experiment write up
- rock identification
- geology kitchen
- chocolate chip mining activity

STANDARDS

Ohio - Grade 6 - Science
ESS.2.
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
ESS.3.
Igneous, metamorphic and sedimentary rocks form in different ways.
ESS.5.
Rocks, minerals and soils have common and practical uses.

STANDARDS

Ohio - Grade 6 - Science
ESS.2.
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
ESS.3.
Igneous, metamorphic and sedimentary rocks form in different ways.
ESS.5.
Rocks, minerals and soils have common and practical uses.

Unit 6: Rock Cycle

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

-understand and describe the rock cycle

STANDARDS

Ohio - Grade 6 - Science
ESS.2.
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
ESS.3.
Igneous, metamorphic and sedimentary rocks form in different ways.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

-Edpuzzle

-Rock Cycle Drawing

-Rock Cycle Blooket

-124-135 pages Red Book

pages 118-121 Blue Book

water erosion lab

quck modeling weathering lab

STANDARDS

Ohio - Grade 6 - Science
ESS.2.
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
ESS.3.
Igneous, metamorphic and sedimentary rocks form in different ways.

Unit 6: Rock Cycle

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to describe the series of processes and classes of rocks that make up the rock cycle

Students will be able to identify and describe the steps of the rock cycle

STANDARDS

Ohio - Grade 6 - Science
ESS.2.
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
ESS.3.
Igneous, metamorphic and sedimentary rocks form in different ways.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Rock Cycle Quiz
- Rock Cycle Drawing
- Rock cycle lab

STANDARDS

Ohio - Grade 6 - Science
ESS.2.
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
ESS.3.
Igneous, metamorphic and sedimentary rocks form in different ways.

STANDARDS

Ohio - Grade 6 - Science
ESS.2.
Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
ESS.3.

Unit 6: Rock Cycle

Science - 6th grade - Last Updated on June 30, 2023

Igneous, metamorphic and sedimentary rocks form in different ways.

Unit 7: Soil

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Students will be able to understand the different layers of soil and what's in each layer.

STANDARDS

Ohio - Grade 6 - Science
ESS.4.
Soil is unconsolidated material that contains nutrient matter and weathered rock.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Soil booklet
Pages 150-165 Blue
Pages 154-165 Red
-seed survivor games
-dust bowl video
Secret of soil
Lab-layers of soil with pudding

STANDARDS

Ohio - Grade 6 - Science
ESS.4.
Soil is unconsolidated material that contains nutrient matter and weathered rock.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

6.ESS.4

-Students will be able to understand material in soil along with the steps of the rock cycle

STANDARDS

Ohio - Grade 6 - Science
ESS.4.
Soil is unconsolidated material that contains nutrient matter and weathered rock.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

-quiz over soil
-secret of soil activity

STANDARDS

Ohio - Grade 6 - Science
ESS.4.
Soil is unconsolidated material that contains nutrient matter and weathered rock.

Unit 7: Soil

Science - 6th grade - Last Updated on June 30, 2023

STANDARDS	
Ohio - Grade 6 - Science	
	ESS.4.
Soil is unconsolidated material that contains nutrient matter and weathered rock.	

Unit 8: motion

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

An object motion can be described by speed and direction

STANDARDS

Ohio - Grade 6 - Science
PS.4.
An object's motion can be described by its speed and the direction in which it is moving.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Motion Vocabulary

Pages 214-223 in the blue book

SOLE on Motion terms

Motion questions

Bill Nye Motion

Football (NFL) Laws of Motion video and questions

Science of the Olympic Games video and questions about Motion

Motion Blooket

NewsELA articles

choice assignment

newtons 3 laws packet

STANDARDS

Ohio - Grade 6 - Science
PS.4.
An object's motion can be described by its speed and the direction in which it is moving.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

6.ps.4

students will be able to determine motion based on speed and direction of an object

Unit 8: motion

Science - 6th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Motion Quiz
- choice assignment
- NFL motion and velocity
- science of the olympic games questions

STANDARDS

Ohio - Grade 6 - Science
PS.4.
An object’s motion can be described by its speed and the direction in which it is moving.

Unit 9: Energy

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Students will be able to understand the two main types of energy: Potential and Kinetic

STANDARDS

Ohio - Grade 6 - Science
PS.3.
There are two categories of energy: kinetic and potential.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Energy Vocabulary
Energy BLooket
Energy Edgenuity
NewsELA articles
Sole over Energy
pages 236-253 in blue book
Tiki the Penguin activity
Energy Keynote
Energy Webquest
Mystery Science #2, #3
Mosa Mack on Energy
Ramp Activity
Roller Coaster Building
Energy Study Guide

STANDARDS

Ohio - Grade 6 - Science
PS.3.
There are two categories of energy: kinetic and potential.

Unit 9: Energy

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will know the difference and be able to identify the difference between Kinetic and Potential Energy and they will also understand the Law of Conservation of Energy.

STANDARDS

Ohio - Grade 6 - Science
PS.3.
There are two categories of energy: kinetic and potential.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Rube Goldberg Project

Energy Test

Roller Coaster Building

STANDARDS

Ohio - Grade 6 - Science
PS.3.
There are two categories of energy: kinetic and potential.

STANDARDS

Ohio - Grade 6 - Science
PS.4.
An object's motion can be described by its speed and the direction in which it is moving.
PS.3.
There are two categories of energy: kinetic and potential.

Unit 10: Matter 1

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

All matter is made up of small particles called atoms.

STANDARDS

Ohio - Grade 6 - Science
PS.1.
All matter is made up of small particles called atoms.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Matter Vocabulary

Matter Blooket

NewsELA articles

Matter Kahoots

pages 264-287 Blue book

Study Jams Matter

Study Jams Quiz

Note Pages to glue in notebook

Matter Reading and comprehension questions

Atomic Model Video

Atomic Model Timeline Project and presentation

Matter Questions

STANDARDS

Ohio - Grade 6 - Science
PS.1.
All matter is made up of small particles called atoms.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

students will be able to understand that matter is made up of small particles.

STANDARDS

Ohio - Grade 6 - Science
PS.1.
All matter is made up of small particles called atoms.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Study jams quiz on matter

matter quiz

Atomic Timeline Project

STANDARDS
Ohio - Grade 6 - Science
PS.1.
All matter is made up of small particles called atoms.

STANDARDS
Ohio - Grade 6 - Science
PS.1.
All matter is made up of small particles called atoms.

Unit 11: Matter 2

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion.
students will know the differences between solid liquids and gasses.

STANDARDS

Ohio - Grade 6 - Science
PS.2.
Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Matter Vocabulary
Matter Blooket
NewsELA articles
pages 300-315 blue book
penny surface area lab
Matter Kahoots
Bill Nye Matter video with questions
States of Matter Games
Internet lessons on Matter
Matter Study guide
States of Matter Escape Room
Practice Quiz on Quizzez
Matter quiz

STANDARDS

Ohio - Grade 6 - Science
PS.2.
Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion.

Unit 11: Matter 2

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

students should be able to understand that Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion.

students will know the differences between a liquid a solid and a gas.

STANDARDS

Ohio - Grade 6 - Science
PS.2.
Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

matter quiz

matter escape room

STANDARDS

Ohio - Grade 6 - Science
PS.2.
Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion.

STANDARDS

Ohio - Grade 6 - Science
PS.2.
Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion.

Unit 12: Life Science-cells and living things

Science - 6th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1. Scientists that discovered cells and the microscopes they used.
2. The different organelles of animal and plant cells
3. Osmosis and diffusion
4. Cell Division and how it occurs
5. How systems of living things work together- hierarchical levels of organization in living things and connectedness of structures to functions, i.e. intestine is long bc process of absorbing nutrients takes time and surface area

STANDARDS

Ohio - Grade 6 - Science
LS.1.
Cells are the fundamental unit of life.
LS.2.
All cells come from pre-existing cells.
LS.3.
Cells carry on specific functions that sustain life.
LS.4.
Living systems at all levels of organization demonstrate the complementary nature of structure and function.
SIA.3
Design and conduct a scientific investigation
SIA.2
Identify questions that can be answered through scientific investigations
SIA.1
Apply knowledge of science content to real-world challenges.

Unit 12: Life Science-cells and living things

Science - 6th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

pages in the blue book 332-368

Bill Nye Cells and questions

Facebook Scientists notes and profile

Microscope videos

Draw and labeling Microscope

Newsela June discovered corona under microscope

Looking at plants and animal cells under microscope draw and label

quizzex cell parts

blooket cell parts

Edpuzzle cells

Legends of Learning Cells

Cells Alive Games on Cell parts

Construction of cell city in groups

Construction of cell using a cake for enrichment students

Organelle Research of cells

Organelle Debates

2 videos intro to cells along with worksheet

BALloon Box with vanilla

Phases of Mitosis project

Study guide cells

Kahoots cells

Cell Breakout

Frog Dissection keynote

Virtual Frog Dissection

Videos on Frog dissection

Cell Detective

Real frog dissection

Cell Test

Zootopia with questions as a review

Outbreak project

movie outbreak

STANDARDS

Unit 12: Life Science-cells and living things

Science - 6th grade - Last Updated on June 30, 2023

Ohio - Grade 6 - Science
LS.1.
Cells are the fundamental unit of life.
LS.2.
All cells come from pre-existing cells.
LS.3.
Cells carry on specific functions that sustain life.
LS.4.
Living systems at all levels of organization demonstrate the complementary nature of structure and function.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation

Unit 12: Life Science-cells and living things

Science - 6th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to :

know which Scientists discovered cells and the microscopes they used.

The different organelles of animal and plant cells

what Osmosis and diffusion is

what Cell Division is and how it occurs

How systems of living things work together

STANDARDS

Ohio - Grade 6 - Science
LS.1.
Cells are the fundamental unit of life.
LS.2.
All cells come from pre-existing cells.
LS.3.
Cells carry on specific functions that sustain life.
LS.4.
Living systems at all levels of organization demonstrate the complementary nature of structure and function.

Unit 12: Life Science-cells and living things

Science - 6th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Test over Cells
outbreak project
Facebook scientist profile page
Drawing of microscope slides
Building cell cities/building cells with the correct organelles
organelle debates
double helix creations
Dancing Raisin lab
Mitosis poster
Cells Breakout
Frog Dissection

STANDARDS

Ohio - Grade 6 - Science
LS.1.
Cells are the fundamental unit of life.
LS.2.
All cells come from pre-existing cells.
LS.3.
Cells carry on specific functions that sustain life.
LS.4.
Living systems at all levels of organization demonstrate the complementary nature of structure and function.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation

STANDARDS

Unit 12: Life Science-cells and living things

Science - 6th grade - Last Updated on June 30, 2023

Ohio - Grade 6 - Science
LS.1.
Cells are the fundamental unit of life.
LS.2.
All cells come from pre-existing cells.
LS.3.
Cells carry on specific functions that sustain life.
LS.4.
Living systems at all levels of organization demonstrate the complementary nature of structure and function.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation
SIA.1
Apply knowledge of science content to real-world challenges.

Science - 7th grade

Vermilion Local School District

UNITS (8/8 SELECTED)		SUGGESTED DURATION
	Unit 1: Science, Technology, and Engineering	20 lessons
	Unit 2: The Earth-Moon-Sun System	25 lessons
	Unit 3: Earth's Water	20 lessons
	Unit 4: Earth's Atmosphere	20 lessons
	Unit 5: Weather and Climate	20 lessons
	Unit 6: Earth's Biomes and Ecosystems	20 lessons
	Unit 7: Properties of Matter	25 lessons
	Unit 8: Energy	22 lessons

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Lab Safety

How scientists discover things.

STANDARDS

Ohio - Grade 7 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.2
Identify questions that can be answered through scientific investigations

What tools and units are used in science.

STANDARDS

Ohio - Grade 7 - Science
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

How scientists make sense of the data.

STANDARDS

Ohio - Grade 7 - Science
SIA.5
Analyze and interpret data
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

SIA.9
Communicate scientific procedures and explanations
SIA.3
Design and conduct a scientific investigation

The engineering design process.

STANDARDS

Ohio - Grade 7 - Science
SIA.3
Design and conduct a scientific investigation
SIA.5
Analyze and interpret data
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.10
Design technological/engineering solutions.
SIA.7
Think critically and logically to connect evidence and explanations

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Lab Safety Practices: Contract, I Have Who Has, Task Cards, Violations Comic, Color By Number

Distinguishing Science from other forms of inquiry: Fusion: Science Technology and Engineering: Lesson 1:

What is Science pgs 5-13, Testable and Non-testable Questions – post-it notes, What is Science Virtual Lab, Science Charades, Lesson Review pg13

STANDARDS

Ohio - Grade 7 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.2
Identify questions that can be answered through scientific investigations

Measurement systems and tools of the scientist. Fusion: Science Technology and Engineering: Lesson 3

Scientific Tools and Measurement pgs 35-45, Investigate Making Measurements Lab, Representing Data Virtual Lab, Measuring/tool practice WS, Metric Olympics, Metric Scavenger Hunt, Investigate Density Virtual Lab, Density Cube lab, Case of the Missing Crown, Lesson Review pg33

STANDARDS

Ohio - Grade 7 - Science
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Types of Scientific Investigations, how to conduct an investigation, and what makes a good

investigation Study Jams: Scientific Method, Fusion: Science Technology and Engineering: Lesson 2: Scientific Investigations pgs 19-33, Scientific Investigation Virtual Lab, Graphic Organizer, Hypothesis Bootcamp, Independent/Dependent/Constant Variables Practice WS, Task Cards, Identifying Parts of an Investigation, Growing Microorganisms: Bread Lab, Seed Germination Lab, Lesson Review pg45

STANDARDS

Ohio - Grade 7 - Science
SIA.8

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

Recognize and analyze alternative explanations and predictions
SIA.5
Analyze and interpret data
SIA.7
Think critically and logically to connect evidence and explanations
SIA.9
Communicate scientific procedures and explanations
SIA.3
Design and conduct a scientific investigation

Creating and analyzing tables and graphs. Making models Fusion: Science Technology and Engineering: Lesson 4: Representing Data pgs 47-57, Identifying Parts of an Investigation, Growing Microorganisms, Lesson Review pg57

STANDARDS

Ohio - Grade 7 - Science
SIA.5
Analyze and interpret data
SIA.7
Think critically and logically to connect evidence and explanations

Engineering Design skills and process Fusion: Science Technology and Engineering: Lesson 5: The Engineering Design Process pgs 61-71, The Engineering Design Process Graphic Organizer and Color By Number, Lesson Review pg71, Unit 1: Review pgs75-78

STANDARDS

Ohio - Grade 7 - Science
SIA.3
Design and conduct a scientific investigation
SIA.5
Analyze and interpret data
SIA.7

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

Think critically and logically to connect evidence and explanations
SIA.10
Design technological/engineering solutions.
SIA.8
Recognize and analyze alternative explanations and predictions

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify safe and non-safe practices in a lab

Identify what distinguishes science from other forms of knowledge.

STANDARDS

Ohio - Grade 7 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations

Identify and summarize the characteristics of scientific investigations

STANDARDS

Ohio - Grade 7 - Science
SIA.3
Design and conduct a scientific investigation
SIA.5
Analyze and interpret data
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations

Utilize units of measurement and tools used in scientific investigations

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

STANDARDS

Ohio - Grade 7 - Science
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Analyze and/or create tables, graphs and models

STANDARDS

Ohio - Grade 7 - Science
SIA.5
Analyze and interpret data
SIA.7
Think critically and logically to connect evidence and explanations

Explain how the the engineering design process is used to develop solutions

STANDARDS

Ohio - Grade 7 - Science
SIA.3
Design and conduct a scientific investigation
SIA.5
Analyze and interpret data
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.10
Design technological/engineering solutions.

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Students will look at several labs going on in a comic and determine who is practicing lab safety and who is not. They will write the lab safety violation or correct practice of each character in the comic.

STANDARDS

Ohio - Grade 7 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations
SIA.10
Design technological/engineering solutions.

Lesson 1: What is Science?

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

Students will determine what investigations are testable. Students will demonstrate an understanding of what questions are testable and non-testable in given scenarios.

STANDARDS

Ohio - Grade 7 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations

Lesson 2: Scientific Investigations

Define experiment and observations. Differentiate between experiments and other scientific investigations. Define hypothesis, independent variable, dependent variable, constant, data. Explain the major processes involved in conducting a scientific investigation. Explain the importance of carrying out multiple trials. List some characteristics of good scientific investigations. Identify sources of experimental error.

STANDARDS

Ohio - Grade 7 - Science
SIA.3
Design and conduct a scientific investigation
SIA.5
Analyze and interpret data
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

SIA.9

Communicate scientific procedures and explanations

Students will conduct a lab, Growing Microorganisms. They will identify the hypothesis, procedure, and variables, They will collect and analyze their data. They develop a conclusion.

STANDARDS

Ohio - Grade 7 - Science

SIA.2

Identify questions that can be answered through scientific investigations

SIA.3

Design and conduct a scientific investigation

SIA.4

Use appropriate mathematics, tools and techniques to gather data and information

SIA.5

Analyze and interpret data

SIA.6

Develop descriptions, models, explanations and predictions

SIA.7

Think critically and logically to connect evidence and explanations

SIA.9

Communicate scientific procedures and explanations

Lesson 3: Scientific Tools and Measurement

Explain how a measurement describes something. Explain why the SI was developed, and some advantages of it. Apply prefixes to metric units to convert between scales. Express number in scientific notation where appropriate. Identify units of length, mass, time, and temperature and the tools used to make those measurements. List other types of measurements (volume, density, weight). Describe the precision and accuracy of a data set. Explain why scientists may use estimates or approximate measurements. List examples of tools scientist may use in the lab and describe their purposes. Describe how computers and technology can be used as tools for scientific investigations.

STANDARDS

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

Ohio - Grade 7 - Science

SIA.4

Use appropriate mathematics, tools and techniques to gather data and information

Lesson 4: Representing Data

Construct tables and graphs. Interpret data in tables and graphs. Use the data and patterns in graphs to make predictions. Explain how the mean describes a set of data. Explain how scientists use models and simulations. Use models and simulations to represent phenomena and systems.

STANDARDS

Ohio - Grade 7 - Science

SIA.5

Analyze and interpret data

SIA.7

Think critically and logically to connect evidence and explanations

Lesson 5: The Engineering Design Process

Compare the goals of science and engineering. Describe the relationship between science, math, technology and engineering. Provide examples of how technology is used to gather and analyze data. Describe the importance of good research skills for engineering design. Provide examples of technical skills used in engineering design. Explain why creativity and methodical thinking skills are important in engineering design. Describe the steps of the engineering design process. Explain how a prototype is used in the engineering design process.

STANDARDS

Ohio - Grade 7 - Science

SIA.3

Design and conduct a scientific investigation

SIA.5

Analyze and interpret data

SIA.8

Recognize and analyze alternative explanations and predictions

STANDARDS

Unit 1: Science, Technology, and Engineering

Science - 7th grade - Last Updated on June 30, 2023

Ohio - Grade 7 - Science
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations
SIA.10
Design technological/engineering solutions.

Unit 2: The Earth-Moon-Sun System

Science - 7th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

How Earth's days, years, and seasons related to the way Earth moves in space.

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

How the Earth, moon and Sun affect each other.

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

What causes eclipses and tides.

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

Unit 2: The Earth-Moon-Sun System

Science - 7th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Earth's rotation and revolution around the Sun Fusion: The Earth-Moon-Sun System: Lesson 1: Earth's Days, Years, and Seasons pgs 289-297, Earth's motion vocabulary/foldable, Earth's Rotation and Revolution Lab, kinesthetically modeling axial tilt, rotation and revolution, Study Jams: A Day on Earth, News ELA– Why is the Earth Rotating, Enrichment: Earth's Motion, Lesson Review pg297

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

Understanding how direct and indirect sunlight is influenced by the Earth's axis

Fusion: The Earth-Moon-Sun System: Lesson 1: Earth's Days, Years, and Seasons pgs 289-297, Does Earth's Shape Affect Temperatures on Earth's Surface? Lab, Seasons Keynote/ whiteboard activity, Season's Virtual Lab, BrainPop: Seasons, BrainPop: Solstice and Equinox, Bill Nye: Seasons, Seasons Graphic Organizer, Modeling Day, Year, and Season Lab, Seasons Model, Earth's Motion/Content Vocabulary, Earth's Motion Key Concept, BrainPop: Leap Year, BrainPop: Time Zones, Blooket: Reason for the Seasons, Lesson Review pg309

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

Relative positions of the Earth, moon and Sun during eclipses and tides

Fusion: The Earth-Moon-Sun System: Lesson 2: Moon Phases and Eclipses pgs 301-309, (Moon Launch and Mini Labs, Moon's Formation Keynote/Interactive, Bill Nye: The Moon, What Causes Moon Phases Lab, Moon Phase [MP] Scavenger Hunt, MP model, MP foldable, MP cut and paste, MP Keynote/whiteboards, MP HyperDoc, MP ColorByNumber, BrainPop MP, Phases of the Moon Outline Notes, MP Content Practice, Moon Phase Interactive Google Slides, MP Challenge, MP Exploration "webquest," MP Task Cards, Fusion: The Earth-Moon_Sun System: Lesson 3: Earth's Tides pgs 315-323, Eclipses Outline Notes, BrainPop Eclipses, Drawing Eclipses Models, Tides Outline, Tides HyperDoc, Tides Booklet, Study Jams Tides, BrainPop Tides, Kahoot Test Review, Lesson Review pg323

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

SIA.6

Develop descriptions, models, explanations and predictions

Unit 2: The Earth-Moon-Sun System

Science - 7th grade - Last Updated on June 30, 2023

SIA.7

Think critically and logically to connect evidence and explanations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Relating Earth's days, years, and seasons to Earth's movement in space

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

Describe and model the effects the Sun and moon have on Earth due to gravitational pull, moon phases, eclipses and tides

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

Unit 2: The Earth-Moon-Sun System

Science - 7th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson 1: Earth's Days, Years and Seasons

Define and describe Earth's rotation about an axis. Define and explain why an Earth day is 24 hours long. Define and explain how the Earth's revolution and one year relate. Describe the tilt of Earth's axis and how it affects the angle the sun's rays strike it. Describe how rays affect temperature in a region. Explain how the tilt of Earth's axis affects hours of daylight. Explain what causes season. Describe equinox and solstice.

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

Lesson 2: Moon Phases and Eclipses

Define gravity. Describe the relationships between Earth, the moon and the Sun. Explain why observers see only one side of the moon. Define lunar phases. Describe the lunar cycle. Relate the cycle to relative positions of the Sun, the moon and the Earth. Describe lunar and solar eclipses (alignment, umbra, penumbra).

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

Lesson 3: Earth's Tides

Define tides. Explain high and low tide. Explain what causes tides on Earth. Define tidal range, spring tide and neap tide. Explain the alignment of the Earth, moon and Sun during specific tides. Explain how Earth's rotation and revolution of the moon around the Earth affects the timing of Earth's tides (two high and low tides daily).

STANDARDS

Ohio - Grade 7 - Science

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

STANDARDS

Ohio - Grade 7 - Science

Unit 2: The Earth-Moon-Sun System

Science - 7th grade - Last Updated on June 30, 2023

ESS.4.

The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.

Unit 3: Earth's Water

Science - 7th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

What makes water important.

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

The changes of state and movement of water in the water cycle.

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

How fresh water flows on Earth.

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

How ocean water moves.

STANDARDS

Ohio - Grade 7 - Science

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Human impact on water resources.

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere,

Unit 3: Earth's Water

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hydrosphere and atmosphere.

Unit 3: Earth's Water

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METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

The importance and distribution of water. Fusion: Earth's Water: Lesson 1: Water and Its Properties pgs 81-91, Water and Its Properties Outline Notes, Activities--Property Signs p110, Water Sport p114, Water and Its Properties Booklet, Labs and Demos p111, Alternative Assessment p115

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

Structure, states and properties of water.

Fusion: Earth's Water: Lesson 1: Water and Its Properties pgs 81-91, Water and Its Properties Outline Notes, Activities--Property Signs p110, Water Sport p114, Water and Its Properties Booklet, Labs and Demos p111, Alternative Assessment p115, Lesson Review pg91

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

The water cycle and the transport of matter and energy.

Fusion: Earth's Water: Lesson 2: The Water Cycle pgs 93-103, Water Molecule Comic, Modeling the Water Cycle, The Water Cycle Outline Notes, The Water Cycle Virtual Lab, Study Jams: The Water Cycle, CSI Water Cycle Mystery, Bill Nye: Water Cycle, Energy in Water Demonstration, Water Cycle Color-by-Number, Lesson Review pg103

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

Surface and groundwater.

Fusion: Earth's Water: Lesson 3: Surface Water and Groundwater pgs 105-115, Lesson 3 Outline Notes, Surface water/groundwater/well demonstration, Porosity and Permeability Lab Demo, Lessons 1-3 Crossword (Vocabulary) Puzzle, BrainPop: Groundwater, Ogallala Aquifer WebQuest, Lesson Review pg115

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere,

Unit 3: Earth's Water

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hydrosphere and atmosphere.

Oceans currents and circulation.

Fusion: Earth's Water: Lesson 4: Ocean Currents pgs 117-129, Ocean Currents Introduction and Map Activity, Modeling the Coriolis Effect, Bill Nye Ocean Currents, Nemo Goes to Disney, Activity: Oceans Currents, Ocean Currents and Convection PP and Notes, Lesson Review pg129

STANDARDS

Ohio - Grade 7 - Science

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Water as a resource, pollution, supply and flow.

Fusion: Earth's Water: Lesson 5: Human Impact on Water pgs 135-147, Turbidity and Water Temperature Lab, Phosphorus Reading Passage/Information, Investigating Nutrients Phosphorus Musical Chairs, Investigating Water Quality, Lesson Review pg147

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Unit 3: Earth's Water

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COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Describe water's structure, its properties, and importance to Earth's systems.

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

Describe the water cycle and the processes.

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

Explain the processes involved in the flow of water above and below the ground.

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

Describe the movement of ocean water and the causes of that movement.

STANDARDS

Ohio - Grade 7 - Science

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Explain human impact on the quality and supply of fresh water.

STANDARDS

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere,

Unit 3: Earth's Water

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hydrosphere and atmosphere.

Unit 3: Earth's Water

Science - 7th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson 1: Water and Its Properties

Explain water's importance to Earth's surface and weather, and to living organisms, including humans. Describe the distribution of water on Earth. Describe the structure of water. Explain why water is a polar molecule. Describe the three states of water on Earth. Describe the properties of water in each of these three states (density). Explain the properties of water (cohesion, adhesion, specific heat, universal solvent).

STANDARDS

Ohio - Grade 7 - Science
ESS.1.
The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

Lesson 2: The Water Cycle

Define water cycle. List the states of matter and describe how changes of state occur (melting, freezing, evaporation, condensation, sublimation, deposition). Define and describe three ways water reaches the atmosphere (evaporation, transpiration, sublimation). Define and describe condensation and precipitation. Describe what happens to water after it falls to Earth. List and provide examples of two things that the water cycle transports (energy and matter).

STANDARDS

Ohio - Grade 7 - Science
ESS.1.
The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions

Lesson 3: Surface Water and Groundwater

Explain where surface water comes from and why living things depend on it. Explain the relationship between rivers and tributaries. Explain stream load, gradient, and flow of a stream's speed. Explain processes carried on within river systems (sediment). Describe watersheds and their structure and how water flow is affected. Describe how humans use watersheds. Explain what groundwater is and how it forms. Define water table and aquifer. Describe the effects of porosity and permeability. Identify how humans use groundwater. Determine how aquifers are discharged and recharged.

Unit 3: Earth's Water

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STANDARDS

Ohio - Grade 7 - Science
ESS.1.
The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

Lesson 4: Ocean Currents

Define ocean currents and surface currents. List and describe three things that affect surface currents (coriolis effect, continental deflection, surface winds). Define deep currents and explain how they form. Define convection current. Explain how convection currents transfer energy. Define upwelling and explain the importance of upwelling to ocean life. Describe ocean circulation and provide examples of how ocean currents transport matter and energy.

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Lesson 5: Human Impact on Water

Tell why humans need water, why fresh water is a limited resource, explain the importance of water quality. Compare supply and quality. Define water pollution, point-source and non-point source pollution. Explain how humans can cause water pollution. Define eutrophication and acid rain. Explain how water quality is maintained in the U.S. and tell how urbanization can affect water quality, fresh water flow and supply.

STANDARDS

Ohio - Grade 7 - Science
ESS.1.
The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations

STANDARDS

Unit 3: Earth's Water

Science - 7th grade - Last Updated on June 30, 2023

Ohio - Grade 7 - Science

ESS.1.

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Unit 4: Earth's Atmosphere

Science - 7th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

What is the atmosphere?

STANDARDS

Ohio - Grade 7 - Science
ESS.3.
The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.

How does energy move through Earth's system?

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

What is wind?

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Human impact on Earth's atmosphere?

STANDARDS

Ohio - Grade 7 - Science
ESS.3.
The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Unit 4: Earth's Atmosphere

Science - 7th grade - Last Updated on June 30, 2023

SIA.6

Develop descriptions, models, explanations and predictions

Unit 4: Earth's Atmosphere

Science - 7th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

The air pressure, temperature, structure, composition and function of Earth's Atmosphere: [The Structure of Earth's Atmosphere](#), Describing Earth's Atmosphere Outline, Earth's Atmosphere Color By Number, [Air pressure Lab](#), Fusion: Earth's Atmosphere: Lesson 1: The Atmosphere pgs 157-169, [Study Jams: Earth's Atmosphere](#), BrainPop: Ozone, BrainPop: Earth's Atmosphere, Pressure Labs, [Measuring Air Pressure Changes](#), [Measuring Oxygen in the Air](#), Fusion: Earth's Atmosphere: Lesson 1: The Atmosphere, Lesson Review p169

STANDARDS

Ohio - Grade 7 - Science

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

ATTACHMENTS

 EarthsAtmosphereColorByNumberScienceColorByNumber-STUDENT.pdf

 AIR_PRESSURE_LABS.key

 Describing_Earth_s_Atmosphere_Outline.pdf

The movement of energy through Earth's system (temperature, heat, thermal energy, expansion, radiation, convection, conduction) Fusion: Earth's Atmosphere: Lesson 2: Energy Transfer pgs 171-183, Particles in Motion, Particles in Motion Demonstration (room temp, ice water, hot water), BrainPop: [Matter Changing State](#), Heat Transfer Doodle Notes, Heat Transfer by Conduction, Convection, & Radiation Information Text and WS, Heat Transfer Foldable, Heat Transfer Task Cards, Convection Current Examples, Heat Transfer Comic (storyboardthat.com)

STANDARDS

Ohio - Grade 7 - Science

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

SIA.4

Use appropriate mathematics, tools and techniques to gather data and information

ATTACHMENTS

 1_-_Heat_Transfer_Foldable_-_Conduction_Convection_Radiation.pdf

 Heat_Transfer_by_Conduction__Convection_and_Radiation_Worksheet.pages

 Heat_Transfer_by_Conduction__Convection_and_Radiation_Passage.pages

Air movement (global and local winds): Fusion: Earth's Atmosphere: Lesson 3: Wind in the Atmosphere pgs

Unit 4: Earth's Atmosphere

Science - 7th grade - Last Updated on June 30, 2023

185-195, Wind in the Atmosphere Digital Lesson & Notes; Global Winds and Jet Stream Read and Apply, Bill Nye: Wind, Study Jams: Pressure and Wind,

STANDARDS

Ohio - Grade 7 - Science
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

ATTACHMENTS

 GlobalWindsandJetStreamReadandApplyNGSSMSESS26-1.pdf

Air quality/pollution and human impact: Fusion: Earth's Atmosphere: Lesson 4: Human Impact on the Atmosphere pgs 201-211, Khan: Greenhouse Effect, BrainPop: Greenhouse Effect, Carbon Atom Journey Activity, Carbon Emissions By Country Mapping Activity, Human Impact: Break Out Activity, Blooket Unit Review

STANDARDS

Ohio - Grade 7 - Science
ESS.3.
The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.6
Develop descriptions, models, explanations and predictions

Unit 4: Earth's Atmosphere

Science - 7th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Explain the layers of the atmosphere and their differences in composition and physical properties

STANDARDS

Ohio - Grade 7 - Science

ESS.3.

The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.

Summarize how energy is transferred through Earth's system

STANDARDS

Ohio - Grade 7 - Science

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Explain how the Sun's energy causes atmospheric movement (wind)

STANDARDS

Ohio - Grade 7 - Science

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Human impact on Earth's atmosphere

STANDARDS

Ohio - Grade 7 - Science

ESS.3.

The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.

Unit 4: Earth's Atmosphere

Science - 7th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson 1: The Atmosphere

Define atmosphere. Identify the main components of Earth's atmosphere. Relate air pressure changes to an increasing distance from Earth's surface. Explain why temperature changes as altitude increases. Identify the four main layers of the atmosphere. Describe the four main layers' physical structure and chemical composition. Explain how the atmosphere protects life. Describes how the atmosphere insulates the planet.

STANDARDS

Ohio - Grade 7 - Science
ESS.3.
The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.

Lesson 2: Energy Transfer

Define key terms (temperature, heat, kinetic energy, thermal energy). Describe what happens when objects at different temperatures come into contact. Identify the main source of energy on Earth's surface. Summarize the process of radiation, convection, and conduction. Identify examples of radiation, conduction and convection.

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Lesson 3: Wind in the Atmosphere

Explain why air moves and identify the source of energy that causes air movement. Illustrate how convection cells in Earth's atmosphere cause high- and low- pressure belts at Earth's surface. Summarize the Coriolis effect. List two factors that produce global winds. Identify and locate three major global wind systems. Describe winds where global pressure belts meet. Define jet streams. Explain how differences in the way land and water absorb and release energy cause local winds, such as sea, land, valley and mountain breezes.

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
ESS.3.

Unit 4: Earth's Atmosphere

Science - 7th grade - Last Updated on June 30, 2023

The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.

Lesson 4: Human Impact on the Atmosphere

Explain why the atmosphere is important. Define air pollution, and identify its sources. Summarize how smog forms. Define particulates. Summarize vehicle emission's effects on air. Explain how air pollution can lead to acid precipitation. Describe the effect of acid precipitation. Define air quality and tell how it is measured. Tell how air pollution affects health. Describe how air pollution might be affecting our planet.

STANDARDS

Ohio - Grade 7 - Science
ESS.3.
The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.6
Develop descriptions, models, explanations and predictions

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
ESS.3.
The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.6
Develop descriptions, models, explanations and predictions

Unit 5: Weather and Climate

Science - 7th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

What is weather and the different types of weather conditions?

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.5
Analyze and interpret data

How the water cycle and global patterns affect weather?

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

How climate is affected by energy from the Sun and Earth's surface?

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

What causes climate change?

STANDARDS

Ohio - Grade 7 - Science
ESS.2.

Unit 5: Weather and Climate

Science - 7th grade - Last Updated on June 30, 2023

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

SIA.4

Use appropriate mathematics, tools and techniques to gather data and information

SIA.5

Analyze and interpret data

SIA.6

Develop descriptions, models, explanations and predictions

Unit 5: Weather and Climate

Science - 7th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Elements of Weather:

Fusion: Weather and Climate: Lesson 1: Elements of Weather pgs 284-288, Pressure All Around Tp278, Effects of Pressure Tp279, Weather Tools project, Lesson Review p231

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.5
Analyze and interpret data

The influences of the water cycle on weather. Patterns in the atmosphere and oceans that affect weather. Fusion: Weather and Climate: Lesson 2: What Influences Weather? pgs 234-245: Lesson Review p245, Air Masses and Fronts Video and Notes, Weather Patterns and Pressure Systems/School to Home WS,

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Climate vs Weather. Factors that affect climate. Fusion: Weather and Climate Lesson 3: Climate pgs 248-260: Lesson Review p261, Climate vs Weather Cryptogram, Weather vs Climate Study Jams, Bill Nye: Climate, Trailer Project (Weather vs Climate)

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Natural climate change and Human impact: Climate Change Virtual, Lesson Review p277, Ice Caps Melting Demo

Unit 5: Weather and Climate

Science - 7th grade - Last Updated on June 30, 2023

p327, Greenhouse Effect Quick Lab p327, Climate Change Puzzle, Climate Change Video-Discussion, Brain Pop Climate Change

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Unit 5: Weather and Climate

Science - 7th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Describe the elements of weather and how they are measured

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.5
Analyze and interpret data

Explain how global patterns influence weather

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Describe factors that affect climate and explain how climates are classified

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Describe cause and effect of climate change.

STANDARDS

Ohio - Grade 7 - Science
ESS.2.

Unit 5: Weather and Climate

Science - 7th grade - Last Updated on June 30, 2023

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

SIA.4

Use appropriate mathematics, tools and techniques to gather data and information

SIA.5

Analyze and interpret data

SIA.6

Develop descriptions, models, explanations and predictions

Weather and Climate Review

STANDARDS

Ohio - Grade 7 - Science

ESS.2.

Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

Unit 5: Weather and Climate

Science - 7th grade - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson 1: Elements of Weather

Define weather. Explain how each the following relates to weather (temperature, humidity, precipitation, air pressure, wind direction, wind speed and visibility). Describe how each of these is measured (temperature, humidity, precipitation, air pressure, wind direction and wind speed). Describe technology that is used in weather data collection.

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions

STANDARDS

Ohio - Grade 7 - Science
ESS.2.
Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions

Unit 6: Earth's Biomes and Ecosystems

Science - 7th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

How cells get and use energy.

STANDARDS

Ohio - Grade 7 - Science
LS.1.
Matter is transferred continuously between one organism to another and between organisms and their physical environments.

How energy flows through an ecosystem.

STANDARDS

Ohio - Grade 7 - Science
LS.1.
Matter is transferred continuously between one organism to another and between organisms and their physical environments.
SIA.5
Analyze and interpret data

How energy and matter move through ecosystems.

STANDARDS

Ohio - Grade 7 - Science
ESS.3.
The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.
PS.2.
Energy can be transformed or transferred but is never lost.
LS.1.
Matter is transferred continuously between one organism to another and between organisms and their physical environments.

Land biomes

STANDARDS

Ohio - Grade 7 - Science

Unit 6: Earth's Biomes and Ecosystems

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LS.2.

In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.

SIA.5

Analyze and interpret data

Aquatic ecosystems

STANDARDS

Ohio - Grade 7 - Science

LS.2.

In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.

SIA.5

Analyze and interpret data

Population influences

STANDARDS

Ohio - Grade 7 - Science

LS.2.

In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.

SIA.5

Analyze and interpret data

Change in ecosystems

STANDARDS

Ohio - Grade 7 - Science

LS.2.

In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.

SIA.5

Unit 6: Earth's Biomes and Ecosystems

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Analyze and interpret data

Unit 6: Earth's Biomes and Ecosystems

Science - 7th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Energy for the cell: Photosynthesis and cellular respiration: Fusion: Earth's Biomes and Ecosystems: Lesson 1: Photosynthesis and Cellular Respiration pgs 336-343, Lesson 1: Reading Notes for Discussion, Cellular Respiration and Photosynthesis Gr. Organizer, Lesson Review p345, Photosynthesis and Cellular Respiration Scavenger Hunt, Dominoes Activity

STANDARDS

Ohio - Grade 7 - Science
LS.1.
Matter is transferred continuously between one organism to another and between organisms and their physical environments.

Ecosystems; Producers, consumers, decomposers; Food Chains, webs and energy pyramids: Fusion: Earth's Biomes and Ecosystems: Lesson 2: Ecology and Energy Transfer pgs 346-358: Lesson Review p359: Energy Pyramids

STANDARDS

Ohio - Grade 7 - Science
LS.1.
Matter is transferred continuously between one organism to another and between organisms and their physical environments.
SIA.5
Analyze and interpret data

Matter and energy in ecosystems; Cycles of matter: Fusion: Earth's Biomes and Ecosystems: Lesson 3: Energy and Matter in Ecosystems pgs 362-372: Lesson Review p373, Carbon Cycle, Nitrogen Cycle, Phosphorus Cycle, Oxygen Cycle

STANDARDS

Ohio - Grade 7 - Science
ESS.3.
The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.
PS.2.
Energy can be transformed or transferred but is never lost.
LS.1.
Matter is transferred continuously between one organism to another and between organisms and their physical environments.

Unit 6: Earth's Biomes and Ecosystems

Science - 7th grade - Last Updated on June 30, 2023

Land Biomes and aquatic ecosystems: Fusion: Earth's Biomes and Ecosystems: Lesson 4: Land Biomes pgs 378-388: Lesson Review p389, Fusion: Earth's Biomes and Ecosystems: Lesson 5: Aquatic Biomes pgs 390-400: Lesson Review p401

STANDARDS

Ohio - Grade 7 - Science
LS.2.
In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.
SIA.5
Analyze and interpret data

Size of Populations; Populations and limiting factors; Interactions within populations: Fusion: Earth's Biomes and Ecosystems: Lesson 5: Population Dynamics pgs 404-414: Lesson Review p415, Biotic and Abiotic Factors,

STANDARDS

Ohio - Grade 7 - Science
LS.2.
In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.
SIA.5
Analyze and interpret data

Changes in ecosystems; Succession in Ecosystems; Ecosystems and Diversity: Fusion: Earth's Biomes and Ecosystems: Lesson 7: Changes in Ecosystems pgs 416-424: Lesson Review p425, Succession Graphic Organizer, Succession Flip Chart

STANDARDS

Ohio - Grade 7 - Science
LS.2.
In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.
SIA.5
Analyze and interpret data

Unit 6: Earth's Biomes and Ecosystems

Science - 7th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Explain how cells capture and release energy

STANDARDS

Ohio - Grade 7 - Science
LS.1.
Matter is transferred continuously between one organism to another and between organisms and their physical environments.

Describe how energy is transferred between organisms (food chain/web/energy pyramid)

STANDARDS

Ohio - Grade 7 - Science
LS.1.
Matter is transferred continuously between one organism to another and between organisms and their physical environments.
SIA.5
Analyze and interpret data

Explain the flow of energy and matter in ecosystems

STANDARDS

Ohio - Grade 7 - Science
ESS.3.
The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.
PS.2.
Energy can be transformed or transferred but is never lost.
LS.1.
Matter is transferred continuously between one organism to another and between organisms and their physical environments.

Describe the characteristics of land biomes and aquatic ecosystems

Explain how population size changes factors and interactions between organisms

STANDARDS

Ohio - Grade 7 - Science

Unit 6: Earth's Biomes and Ecosystems

Science - 7th grade - Last Updated on June 30, 2023

LS.2.

In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.

SIA.5

Analyze and interpret data

Describe how natural process change ecosystems after a natural disturbance

STANDARDS

Ohio - Grade 7 - Science

LS.2.

In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.

SIA.5

Analyze and interpret data

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

[Earth's Biomes and Ecosystems Review](#)

[Earth's Biomes and Ecosystems Test](#), [Earth's Biomes and Ecosystems Retake](#)

STANDARDS

Ohio - Grade 7 - Science

PS.2.

Energy can be transformed or transferred but is never lost.

LS.1.

Matter is transferred continuously between one organism to another and between organisms and their physical environments.

LS.2.

In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.

ESS.3.

Unit 6: Earth's Biomes and Ecosystems

Science - 7th grade - Last Updated on June 30, 2023

The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.

SIA.5

Analyze and interpret data

Unit 7: Properties of Matter

Science - 7th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

What are physical and chemical changes of matter?

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.5
Analyze and interpret data

How do we know what parts make up the atom?

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.5
Analyze and interpret data

How are the elements arranged on the periodic table?

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

How are chemical reactions modeled?

STANDARDS

Ohio - Grade 7 - Science

Unit 7: Properties of Matter

Science - 7th grade - Last Updated on June 30, 2023

PS.1.
The properties of matter are determined by the arrangement of atoms.
PS.2.
Energy can be transformed or transferred but is never lost.
SIA.3
Design and conduct a scientific investigation

What is a solution?

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.3
Design and conduct a scientific investigation

Unit 7: Properties of Matter

Science - 7th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Physical and chemical change; Law of Conservation of Mass: Fusion: Properties of Matter: Lesson 1: Physical and Chemical Change pgs 438-448: Lesson Review p449

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.5
Analyze and interpret data

The Atomic Theory and the atom: Aims Packets Lesson 1-12

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.5
Analyze and interpret data

The information and arrangement on the Periodic Table. Aims Packets Lesson 1-12

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Chemical reactions and equations; energy: Fusion: Properties of Matter: Lesson 4: Chemical Reactions pgs 474-484: Lesson Review p485

Unit 7: Properties of Matter

Science - 7th grade - Last Updated on June 30, 2023

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
PS.2.
Energy can be transformed or transferred but is never lost.
SIA.3
Design and conduct a scientific investigation

Solutions, concentration and solubility; Acids, bases and salts; pH scale: Fusion: Properties of Matter: Lesson 5: Solutions pgs 488-496: Lesson Review p497, Fusion: Properties of Matter: Lesson 6: Acids, Bases and Salts pgs 498-510: Lesson Review p511, Fusion: Properties of Matter: Lesson 7: Measuring pH pgs 512-522: Lesson Review p523, pH Labs

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.3
Design and conduct a scientific investigation

Unit 7: Properties of Matter

Science - 7th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Distinguish between physical and chemical changes of matter.

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.5
Analyze and interpret data

Describe the development of the Atomic Theory.

Understanding the parts of an atom.

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.5
Analyze and interpret data

Describe the relationship between elements on the periodic table and properties of those elements

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Balance a chemical equation

STANDARDS

Ohio - Grade 7 - Science

Unit 7: Properties of Matter

Science - 7th grade - Last Updated on June 30, 2023

PS.1.
The properties of matter are determined by the arrangement of atoms.
PS.2.
Energy can be transformed or transferred but is never lost.
SIA.3
Design and conduct a scientific investigation

Summarize characteristics of a solution

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.3
Design and conduct a scientific investigation

Understand the physical and chemical properties of acids, bases and salts

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.5
Analyze and interpret data

Describe the pH scale and how it is used to classify a solution

STANDARDS

Ohio - Grade 7 - Science
PS.1.
The properties of matter are determined by the arrangement of atoms.
SIA.3
Design and conduct a scientific investigation

Unit 7: Properties of Matter

Science - 7th grade - Last Updated on June 30, 2023

SIA.4

Use appropriate mathematics, tools and techniques to gather data and information

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

[Properties of Matter Review](#)

[Properties of Matter Test](#), [Properties of Matter Retake](#)

STANDARDS

Ohio - Grade 7 - Science

PS.1.

The properties of matter are determined by the arrangement of atoms.

PS.2.

Energy can be transformed or transferred but is never lost.

SIA.3

Design and conduct a scientific investigation

SIA.4

Use appropriate mathematics, tools and techniques to gather data and information

SIA.5

Analyze and interpret data

Unit 8: Energy

Science - 7th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

How energy is transformed and transferred?

STANDARDS

Ohio - Grade 7 - Science

PS.2.

Energy can be transformed or transferred but is never lost.

SIA.5

Analyze and interpret data

The transfer of mechanical energy?

STANDARDS

Ohio - Grade 7 - Science

PS.2.

Energy can be transformed or transferred but is never lost.

PS.3.

Energy can be transferred through a variety of ways.

SIA.3

Design and conduct a scientific investigation

The relationship between heat and temperature?

STANDARDS

Ohio - Grade 7 - Science

PS.3.

Energy can be transferred through a variety of ways.

How waves transfer energy

STANDARDS

Ohio - Grade 7 - Science

PS.3.

Energy can be transferred through a variety of ways.

Unit 8: Energy

Science - 7th grade - Last Updated on June 30, 2023

SIA.3
Design and conduct a scientific investigation

What flows through an electric wire?

How electric circuits work

STANDARDS

Ohio - Grade 7 - Science
PS.3.
Energy can be transferred through a variety of ways.

Unit 8: Energy

Science - 7th grade - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Forms of energy; Energy transformation and transfer; Conservation of energy: Fusion: Energy: Lesson 1: Energy Transformation and Transfer pgs 536-546: Lesson Review p547, Energy Transformations WS, Energy Transformations Color By Number

STANDARDS

Ohio - Grade 7 - Science

PS.1.

The properties of matter are determined by the arrangement of atoms.

SIA.5

Analyze and interpret data

Mechanical energy and work/force: Fusion: Energy: Lesson 2: Mechanical Energy pgs 548-554: Lesson Review p555

STANDARDS

Ohio - Grade 7 - Science

PS.2.

Energy can be transformed or transferred but is never lost.

PS.3.

Energy can be transferred through a variety of ways.

SIA.3

Design and conduct a scientific investigation

Thermal energy and heat/changes of state/transfer: Fusion: Energy: Lesson 3: Thermal Energy and Heat pgs 556-566: Lesson Review p567, Solar Cookers

STANDARDS

Ohio - Grade 7 - Science

PS.3.

Energy can be transferred through a variety of ways.

What is a wave and how it moves energy; Types of waves; Wave properties: Fusion: Energy: Lesson 4: Waves and Energy pgs 576-584: Lesson Review p585, Types of Waves, Slinky and Rope Lab, Wavelength, Amplitude, Frequency

STANDARDS

Unit 8: Energy

Science - 7th grade - Last Updated on June 30, 2023

Ohio - Grade 7 - Science
PS.3.
Energy can be transferred through a variety of ways.
SIA.3
Design and conduct a scientific investigation

Current, voltage and resistance; Basic electric circuits and how to use electricity safely: Fusion: Energy: Lesson 5: EElectric Current pgs 588-594: Lesson Review p595, Fusion: Energy: Lesson 6: Electric Circuits pgs 598-608: Lesson Review p609, Circuit Labs and Project.

STANDARDS

Ohio - Grade 7 - Science
PS.3.
Energy can be transferred through a variety of ways.

Unit 8: Energy

Science - 7th grade - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Analyze how energy is conserved through transformations/ transfers

STANDARDS

Ohio - Grade 7 - Science
PS.2.
Energy can be transformed or transferred but is never lost.
SIA.5
Analyze and interpret data

Describe mechanical energy transfers (push/pull)

STANDARDS

Ohio - Grade 7 - Science
PS.2.
Energy can be transformed or transferred but is never lost.
PS.3.
Energy can be transferred through a variety of ways.
SIA.3
Design and conduct a scientific investigation

Analyze the relationship between heat, temperature, and thermal energy

STANDARDS

Ohio - Grade 7 - Science
PS.3.
Energy can be transferred through a variety of ways.

Distinguish between the types of waves and their components

STANDARDS

Ohio - Grade 7 - Science
PS.3.
Energy can be transferred through a variety of ways.

Unit 8: Energy

Science - 7th grade - Last Updated on June 30, 2023

SIA.3

Design and conduct a scientific investigation

Describe how electric charges flow

Basic electric circuits and how to use electricity safely

STANDARDS

Ohio - Grade 7 - Science

PS.3.

Energy can be transferred through a variety of ways.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

[Energy Review](#)

[Energy Test](#), [Energy Retake](#)

STANDARDS

Ohio - Grade 7 - Science

PS.1.

The properties of matter are determined by the arrangement of atoms.

PS.2.

Energy can be transformed or transferred but is never lost.

PS.3.

Energy can be transferred through a variety of ways.

SIA.3

Design and conduct a scientific investigation

SIA.5

Analyze and interpret data

Science - 8th grade

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
<div></div> Unit 1: September (Introduction to Science/Physical Science)	20 lessons
<div></div> Unit 2: October (Physical Science)	20 lessons
<div></div> Unit 3: November (Physical and Earth Science)	20 lessons
<div></div> Unit 4: December (Earth Science)	15 lessons
<div></div> Unit 5: January (Earth Science)	20 lessons
<div></div> Unit 6: February (Earth Science)	20 lessons
<div></div> Unit 7: March (Life Science)	20 lessons
<div></div> Unit 8: April (Life Science)	20 lessons
<div></div> Unit 9: May (Physical Science Review)	20 lessons

Unit 1: September (Introduction to Science/Physical Science)

Science - 8th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Scientific Method
Graphing Skills
Reference Point
Relative Motion
Speed
Independent and Dependent Variables

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Simulations (Phet)
Textbook Assignments (Fusion)
Fusion Virtual Labs
Notes
Labs
Demonstrations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to define relative motion, and be able to determine the relative speed of an object using a reference point. Students will be able to create a graph with proper labels and identify independent and dependent variables.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Vocab Quiz
Unit 1 Test
-

STANDARDS

Ohio - Grade 8 - Science
PS.1.
Forces between objects act when the objects are in direct contact or when they are not touching.
PS.2.
Forces have magnitude and direction.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation

Unit 1: September (Introduction to Science/Physical Science)

Science - 8th grade - Last Updated on June 30, 2023

SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data

Unit 2: October (Physical Science)

Science - 8th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Newton's Laws of Motion
Contact and non-contact forces
Force Diagrams
Types of Potential Energy(PE)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Simulations (Phet)
Textbook Assignments (Fusion)
Fusion Virtual Labs
Notes
Labs
Demonstrations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to explain Newton's laws of motion and give examples. Students will be able to describe the magnitude and direction of force in force diagrams. Students will be able to describe different types of PE.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Vocab Quiz
Unit 2 Test

STANDARDS

Ohio - Grade 8 - Science
PS.1.
Forces between objects act when the objects are in direct contact or when they are not touching.
PS.2.
Forces have magnitude and direction.
PS.3.
There are different types of potential energy.

Unit 3: November (Physical and Earth Science)

Science - 8th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Types of PE (continued)
Density
Earth's Interior
Seismic Waves
Continental Drift
Plate Tectonics

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Simulations (Phet)
Textbook Assignments (Fusion)
Fusion Virtual Labs
Notes
Labs
Demonstrations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to identify the evidence for continental drift as well as for plate tectonics. Students will be able to describe how density plays a role in planetary differentiation. Students will be able to identify the differences between S-waves and P-waves. They will also be able to explain how scientists use seismic waves to determine the composition of Earth's interior.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Vocab Quiz
Unit 3 Test

STANDARDS

Ohio - Grade 8 - Science
ESS.1.
The composition and properties of Earth's interior are identified by the behavior of seismic waves.
PS.3.
There are different types of potential energy.
SIA.5
Analyze and interpret data
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information

Unit 3: November (Physical and Earth Science)

Science - 8th grade - Last Updated on June 30, 2023

SIA.3
Design and conduct a scientific investigation
SIA.2
Identify questions that can be answered through scientific investigations
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations
SIA.10
Design technological/engineering solutions.

Unit 4: December (Earth Science)

Science - 8th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Plate Tectonics (cont.)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Simulations (Phet)

Textbook Assignments (Fusion)

Fusion Virtual Labs

Notes

Labs

Demonstrations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to identify the evidence for continental drift as well as for plate tectonics.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Vocab Quiz

Unit 4 Test

STANDARDS

Ohio - Grade 8 - Science
ESS.1.
The composition and properties of Earth's interior are identified by the behavior of seismic waves.
ESS.2.
Earth's crust consists of major and minor tectonic plates that move relative to each other.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6

Unit 4: December (Earth Science)

Science - 8th grade - Last Updated on June 30, 2023

Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations

Unit 5: January (Earth Science)

Science - 8th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Constructive and Destructive Forces
Weathering
Erosion
Deposition

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Simulations (Phet)
Textbook Assignments (Fusion)
Fusion Virtual Labs
Notes
Labs
Demonstrations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to identify what forces created certain landforms. Students will be able to identify geologic features using a topographic map.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Vocab Quiz

Unit 5 Test

STANDARDS

Ohio - Grade 8 - Science
ESS.3.
A combination of constructive and destructive geologic processes formed Earth's surface.
ESS.4.
Evidence of the dynamic changes of Earth's surface through time is found in the geologic record.
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation

Unit 5: January (Earth Science)

Science - 8th grade - Last Updated on June 30, 2023

SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations
SIA.10
Design technological/engineering solutions.

Unit 6: February (Earth Science)

Science - 8th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Geologic Age
Relative age
Radiometric Dating
Half-Life

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Simulations (Phet)
Textbook Assignments (Fusion)
Fusion Virtual Labs
Notes
Labs
Demonstrations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to identify the relative age of rock by using relative dating laws. Students are able to determine the absolute age of rock by examining radiometric data.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Quiz

STANDARDS

Ohio - Grade 8 - Science
ESS.4.
Evidence of the dynamic changes of Earth's surface through time is found in the geologic record.
ESS.3.
A combination of constructive and destructive geologic processes formed Earth's surface.
SIA.10
Design technological/engineering solutions.
SIA.9
Communicate scientific procedures and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.7

Unit 6: February (Earth Science)

Science - 8th grade - Last Updated on June 30, 2023

Think critically and logically to connect evidence and explanations
SIA.6
Develop descriptions, models, explanations and predictions
SIA.5
Analyze and interpret data
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.3
Design and conduct a scientific investigation
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations

Unit 7: March (Life Science)

Science - 8th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Index Fossils
Natural Selection
Asexual reproduction
Sexual Reproduction

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Simulations (Phet)
Textbook Assignments (Fusion)
Fusion Virtual Labs
Notes
Labs
Demonstrations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students can identify index fossils and use them determine the relative age of rock strata

Students can identify traits that are beneficial or detrimental to the survival of a species. Students can show how natural selection changes a species over time.

Identify the pros and cons of sexual and asexual reproduction.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test

STANDARDS

Ohio - Grade 8 - Science
LS.2.
Reproduction is necessary for the continuation of every species.
LS.3.
The characteristics of an organism are a result of inherited traits received from parent(s).
LS.1.
Diversity of species occurs through gradual processes over many generations. Fossil records provide evidence that changes have occurred in number and types of species.
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2

Unit 7: March (Life Science)

Science - 8th grade - Last Updated on June 30, 2023

Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations
SIA.10
Design technological/engineering solutions.

Unit 8: April (Life Science)

Science - 8th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Reproduction (cont.)
Genetic and Heredity
Mitosis and Meiosis

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Simulations (Phet)
Textbook Assignments (Fusion)
Fusion Virtual Labs
Notes
Labs
Demonstrations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students can identify the process by which traits are passed down through generations. Students will demonstrate an understanding of dominant and codominant inheritance and be able to use Punnett squares. Students will be able to identify the differences between mitosis and meiosis in the sexual reproduction process

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Quiz
Test

STANDARDS

Ohio - Grade 8 - Science
LS.1.
Diversity of species occurs through gradual processes over many generations. Fossil records provide evidence that changes have occurred in number and types of species.
LS.2.
Reproduction is necessary for the continuation of every species.
LS.3.
The characteristics of an organism are a result of inherited traits received from parent(s).
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2

Unit 8: April (Life Science)

Science - 8th grade - Last Updated on June 30, 2023

Identify questions that can be answered through scientific investigations
SIA.3
Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations
SIA.10
Design technological/engineering solutions.

Unit 9: May (Physical Science Review)

Science - 8th grade - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Physical Science Preview

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Simulations (Phet)
Textbook Assignments (Fusion)
Fusion Virtual Labs
Notes
Labs
Demonstrations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will work on skills needed for physical science as freshmen. Metric system, units of measure and vocabulary.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Quiz
Test

STANDARDS

Ohio - Grade 8 - Science
PS.2.
Forces have magnitude and direction.
PS.3.
There are different types of potential energy.
PS.1.
Forces between objects act when the objects are in direct contact or when they are not touching.
SIA.1
Apply knowledge of science content to real-world challenges.
SIA.2
Identify questions that can be answered through scientific investigations
SIA.3

Unit 9: May (Physical Science Review)

Science - 8th grade - Last Updated on June 30, 2023

Design and conduct a scientific investigation
SIA.4
Use appropriate mathematics, tools and techniques to gather data and information
SIA.5
Analyze and interpret data
SIA.6
Develop descriptions, models, explanations and predictions
SIA.7
Think critically and logically to connect evidence and explanations
SIA.8
Recognize and analyze alternative explanations and predictions
SIA.9
Communicate scientific procedures and explanations
SIA.10
Design technological/engineering solutions.

Science - HS - Honors Physical Science 9

Vermilion Local School District

UNITS (9/9 SELECTED)

 Unit 1: Unit 1 - Scientific Method

 Unit 2: Atomic Structure

 Unit 3: Chemical Bonding

 Unit 4: Chemical Reactions

 Unit 5: Nuclear Chemistry

 Unit 6: Forces

 Unit 7: Motion

 Unit 8: Energy

 Unit 9: Light; Universe

SUGGESTED DURATION

20 lessons

20 lessons

20 lessons

20 lessons

20 lessons

20 lessons

20 lessons

20 lessons

20 lessons

Unit 1: Unit 1 - Scientific Method

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Science skills; Lab Safety;
Properties of Matter: Scientific Method & Measurements; Properties of matter;
States of matter and its changes;

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes,
Measurement lab,
Phase changes lab,
Graphing activity
Chromatography,
Dry Ice Lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- *Use The Scientific Method to solve problems
- *Perform a controlled experiment to test hypothesis
- *Work Safely in the Lab
- *Use the Metric System to measure
- *Correctly use the appropriate lab equipment
- *How to Graph Data
- *Classify matter
- *Use physical and chemical properties
- *Recognize physical and chemical changes
- *Describe States of Matter
- *Describe 6 phase changes
- *Label Phase change graph

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.

Unit 1: Unit 1 - Scientific Method

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by

Unit 1: Unit 1 - Scientific Method

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.

Unit 1: Unit 1 - Scientific Method

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

NS.3.
Science is a Human Endeavor
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
Ohio - High School - Physical Science
PS.M
STUDY OF MATTER
PS.M.1.a
Classification of matter: Heterogeneous vs. homogeneous
PS.M.1.b
Classification of matter: Properties of matter
PS.M.1.c
Classification of matter: States of matter and its changes

Unit 2: Atomic Structure

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Atomic Structure, Models of the Atom, Ions, Isotopes
The Periodic Table, Periodic Trends

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes,
Predicting density in a group, comparing chemical properties within a group

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- *History of the atom
- *Model of the atom
- *subatomic particles
- Atomic number, mass, symbol
- *Size of the atom
- *Periodic Law
- *Use the Periodic Table
- *Organization of the Periodic Table
- *Valence electrons

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test
History of the atom mobile
*Atom Book
*Families of the Periodic Table Board Game
*Periodic Madness Video Project

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Unit 2: Atomic Structure

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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Unit 2: Atomic Structure

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

NS.2.2.b
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Unit 2: Atomic Structure

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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Ohio - High School - Physical Science
PS.M.2.a
Atoms: Models of the atom (components)
PS.M.2.b
Atoms: Ions (cations and anions)
PS.M.2.c
Atoms: Isotopes
PS.M.3.a
Periodic trends of the elements: Periodic law
PS.M.3.b
Periodic trends of the elements: Representative groups

Unit 3: Chemical Bonding

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Chemical Bonds, ionic, covalent, nomenclature

*Polyatomic bonding

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, Ionic vs. Covalent Lab, Assembling Ionic Bonding Card Activity Bonding Party, Covalent Model Building,

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Ionic bonding

Covalent Bonding

Electron Dot Diagrams

Formula writing

How to name compounds

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test

Ionic Bonding Presentations

Bonding Party

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NS.1.5
Recognize and analyze explanations and models.

Unit 3: Chemical Bonding

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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Unit 3: Chemical Bonding

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Ohio - High School - Physical Science
PS.M.4.a
Bonding and compounds: Bonding (ionic and covalent)
PS.M.4.b
Bonding and compounds: Nomenclature
PS.M.5.a
Reactions of matter: Chemical reactions

Unit 4: Chemical Reactions

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Chemical Reactions
Balancing chemical equations;
Types of Reactions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, Conservation of Mass lab
Notes, Reaction Type Labs, Synthesis reactions
single and double replacement lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- *Define the Law of *Conservation of Mass
- *How to balance equations
- *Recognize the reaction types
- *Endothermic vs exothermic

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test

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NS.1.2
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NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.

Unit 4: Chemical Reactions

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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NS.2.3

Unit 4: Chemical Reactions

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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Unit 4: Chemical Reactions

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

NS.4.5
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Ohio - High School - Physical Science
PS.M.5.a
Reactions of matter: Chemical reactions
PS.M.4.b
Bonding and compounds: Nomenclature
PS.M.4.a
Bonding and compounds: Bonding (ionic and covalent)

Unit 5: Nuclear Chemistry

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Nuclear Chemistry; Alpha, Beta, Gamma

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Half-life activity and lab
Nuclear Decay Problems

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- *Identify 3 types of decay
- *Solve nuclear decay problems
- *Solve half-life problems
- *Fission vs Fusion

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test
Nuclear Newsletter

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NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6

Unit 5: Nuclear Chemistry

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

Communicate and support scientific arguments.
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Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
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Unit 5: Nuclear Chemistry

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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Unit 5: Nuclear Chemistry

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

Improvements in technology allow us to gather new scientific evidence.

Ohio - High School - Physical Science

PS.M.5.b

Reactions of matter: Nuclear reactions

Unit 6: Forces

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Forces: Force diagrams Types of forces (gravity, friction, normal, tension)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes,

Foam Rubberband Rocket Lab,
marble momentum lab, Newton's Laws labs,
Inertia Labs

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- *What is force
- *Combining forces
- *Balanced vs unbalanced forces
- *Describe friction
- *Gravity as a force
- *Projectile motion
- *Newton's 3 Laws of Motion
- *Weight and mass

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test
Balloon Rockets

STANDARDS

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NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
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Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).

Unit 6: Forces

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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Recognize and analyze explanations and models.
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Unit 6: Forces

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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Unit 6: Forces

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Ohio - High School - Physical Science
PS.FM
FORCES AND MOTION
PS.FM.1.a
Motion: Introduction to one-dimensional vectors
PS.FM.1.b
Motion: Displacement, velocity (constant, average and instantaneous) and acceleration
PS.FM.1.c
Motion: Interpreting position vs. time and velocity vs. time graphs
PS.FM.2.a
Forces: Force diagrams
PS.FM.2.b
Forces: Types of forces (gravity, friction, normal, tension)
PS.FM.2.c
Forces: Field model for forces at a distance

Unit 7: Motion

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Motion Introduction to one-dimensional vectors, Displacement, velocity (constant, average and instantaneous) and acceleration Interpreting position vs. time and Objects at rest, Objects moving with constant speed

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes,
Distance and Displacement Lab,
Paper Airplanes Lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- *Understanding Frame of reference
- *Distance vs displacement
- *Calculating speed
- *Graphing motion
- *Drawing vectors
- *Calculating acceleration
- *Graphing acceleration

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test
Distance vs Displacement Lab

STANDARDS

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NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5

Unit 7: Motion

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

Recognize and analyze explanations and models.
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Communicate and support scientific arguments.
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Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

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Science can advance through critical thinking about existing evidence.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.4

Unit 7: Motion

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Ohio - High School - Physical Science

PS.FM.2.a

Forces: Force diagrams

PS.FM.2.b

Forces: Types of forces (gravity, friction, normal, tension)

PS.FM.2.c

Forces: Field model for forces at a distance

PS.FM.3.a

Dynamics (how forces affect motion): Objects at rest

PS.FM.3.b

Dynamics (how forces affect motion): Objects moving with constant velocity

PS.FM.3.c

Dynamics (how forces affect motion): Accelerating objects

Unit 8: Energy

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Energy Quantifying kinetic energy, Quantifying gravitational/potential energy, Transfer/transformation of energy (including work) Conduction Convection Radiation Thermal conductivity Thermal Energy
Mechanical Waves and Sound

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes,
Conservation of Energy Lab, Rollercoaster Project,
Sound lab
Boomwhackers Lab, Oscilloscope lesson,
Slinky Lab
Light Lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- *Kinetic Energy
- *Potential Energy
- *Conservation of Energy
- * $E=mc^2$
- *Types of mechanical waves
- *Properties of mechanical waves
- *Behavior of waves
- *Properties of sound

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test
Roller coaster Project

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.

Unit 8: Energy

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a

Unit 8: Energy

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
Science is a Human Endeavor
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
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Science includes the process of comparing patterns of evidence with current theory.

Unit 8: Energy

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio - High School - Physical Science
PS.EW
ENERGY AND WAVES
PS.EW.1.a
Conservation of energy: Quantifying kinetic energy
PS.EW.1.b
Conservation of energy: Quantifying gravitational potential energy
PS.EW.2
Transfer and transformation of energy (including work)
PW.EW.3.a
Waves: Refraction, reflection, diffraction, absorption, superposition
PW.EW.3.b
Waves: Radiant energy and the electromagnetic spectrum
PW.EW.3.c
Waves: Doppler shift

Unit 9: Light; Universe

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

EMS and Light
Exploring The Universe

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, EMS Project
Notes, Universe Tic-Tac-Toe

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- *What are electromagnetic waves
- *Properties of light
- *Electromagnetic Spectrum
- *Life Cycle of a star
- *Draw HR Diagram
- *Structure of stars

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test
EMS project
Universe Tic-Tac Toe

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5

Unit 9: Light; Universe

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
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NS.2.1.e
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NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.

Unit 9: Light; Universe

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
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Unit 9: Light; Universe

Science - HS - Honors Physical Science 9 - Last Updated on June 30, 2023

Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio - High School - Physical Science
PW.EW.3.a
Waves: Refraction, reflection, diffraction, absorption, superposition
PW.EW.3.b
Waves: Radiant energy and the electromagnetic spectrum
PW.EW.3.c
Waves: Doppler shift
PS.U
THE UNIVERSE
PS.U.1
History of the universe
PS.U.2
Galaxies
PS.U.3.a
Stars: Formation - stages of evolution
PS.U.3.b
Stars: Fusion in stars

Science - Biology

Vermilion Local School District

UNITS (8/8 SELECTED)

-  Unit 1: Scientific Method & Characteristics of Living Things
-  Unit 2: Ecosystems
-  Unit 3: Biomolecules
-  Unit 4: Cell Structure and Processes
-  Unit 5: Genetics & Human Heredity
-  Unit 6: DNA and Protein Synthesis
-  Unit 7: Evolution
-  Unit 8: Photosynthesis & Cellular Respiration

SUGGESTED DURATION

5 lessons

35 lessons

20 lessons

35 lessons

30 lessons

15 lessons

30 lessons

15 lessons

Unit 1: Scientific Method & Characteristics of Living Things

Science - Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Scientific Method, experimental design, data analysis, characteristics of living things

Nature of Science, Scientific Inquiry, Practice and Applications, Science is a Way of Knowing, Science is a Human Endeavor, Scientific Knowledge is Open to Revision in Light of New Evidence

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (tetrazolium corn seed lab, Simpsons Scientific Method, 4 dots process of science), virtual interactive activities and simulations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Design and implement a scientific experiment. Gather data, draw conclusions, revise experiments and hypotheses. Recognize the ever changing body of knowledge that is science, graphic analysis and interpretation

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit Test

Skills to be demonstrated: Design and implement a scientific experiment. Gather data, draw conclusions, revise experiments and hypotheses. Recognize the ever changing body of knowledge that is science, graphic analysis and interpretation

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.

Unit 1: Scientific Method & Characteristics of Living Things

Science - Biology - Last Updated on June 30, 2023

NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and

Unit 1: Scientific Method & Characteristics of Living Things

Science - Biology - Last Updated on June 30, 2023

society are influenced by science and engineering.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.
Science is a Human Endeavor
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.

Unit 1: Scientific Method & Characteristics of Living Things

Science - Biology - Last Updated on June 30, 2023

NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.a
Make observations and look for patterns.
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).

Unit 2: Ecosystems

Science - Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Biodiversity, Species diversity, Ecosystems, Equilibrium and disequilibrium, Carrying capacity, Loss of Diversity, Climate change, Anthropocene effects, Extinction, Invasive species

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Wild Herd of Pinto Beans lab/Estimating Goldfish, Milkweed Village Disaster in the Ecosystem activity, arctic food web activity, Fungi of Chance Creek, One Grain of Rice, virtual Paramecium lab, Dillie the Deer debate, Daisy world feedback loops activity, nutrient cycle stations, Lesson of the Kaibab, Wild Obsession reading, fish tank virtual lab, virtual interactive activities and simulations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define biodiversity and identify factors that determine biodiversity, including the biomes with the greatest and least. Identify a population's carrying capacity from a graph or data set. Cite factors that impact biodiversity and the carrying capacity of a population, including density-dependent and density-independent factors.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit/chapter tests Written

Skills to be demonstrated: Define biodiversity and identify factors that determine biodiversity, including the biomes with the greatest and least. Identify a population's carrying capacity from a graph or data set. Cite factors that impact biodiversity and the carrying capacity of a population, including density-dependent and density-independent factors.

Vocabulary quizzes

Dillie the Deer debate

STANDARDS

Ohio - High School - Biology	
	B.DI.1.b
Biodiversity: Species diversity	
	B.DI.2.a
Ecosystems: Equilibrium and disequilibrium	
	B.DI.2.b
Ecosystems: Carrying capacity	
	B.DI.3.a
Loss of Diversity: Climate change	

Unit 2: Ecosystems

Science - Biology - Last Updated on June 30, 2023

B.DI.3.b
Loss of Diversity: Anthropocene effects
B.DI.3.c
Loss of Diversity: Extinction
B.DI.3.d
Loss of Diversity: Invasive species
Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
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Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1

Unit 2: Ecosystems

Science - Biology - Last Updated on June 30, 2023

Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
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NS.3.
Science is a Human Endeavor

Unit 2: Ecosystems

Science - Biology - Last Updated on June 30, 2023

NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
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NS.4.5
Improvements in technology allow us to gather new scientific evidence.

Unit 3: Biomolecules

Science - Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Cellular processes • Characteristics of life regulated by cellular processes • biosynthesis of macromolecules

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Biomolecule chemical testing, water molecule model lab, enzyme controlled reactions lab, Sugar- Not so Sweet Story, Macromolecule Dinner concert reading)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify 4 major macromolecule groups, examples, and the functions and structure of groups. Identify properties of water and interactions with macromolecule groups

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit/chapter tests

Skills to be demonstrated: Identify 4 major macromolecule groups, examples, and the functions and structure of groups. Identify properties of water and interactions with macromolecule groups

Vocabulary quizzes

STANDARDS

Ohio - High School - Nature of Science

NS.1.

Scientific Inquiry, Practice and Applications

NS.1.1

Identify questions and concepts that guide scientific investigations.

NS.1.2

Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.

NS.1.3

Use technology and mathematics to improve investigations and communications.

NS.1.4

Formulate and revise explanations and models using logic and scientific evidence (critical thinking).

Unit 3: Biomolecules

Science - Biology - Last Updated on June 30, 2023

NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
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Make observations and look for patterns.
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NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b

Unit 3: Biomolecules

Science - Biology - Last Updated on June 30, 2023

Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
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Science is a Human Endeavor
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Unit 3: Biomolecules

Science - Biology - Last Updated on June 30, 2023

NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio - High School - Biology
B.C.2.b
Cellular processes: Photosynthesis, chemosynthesis, cellular respiration, biosynthesis of macromolecules

Unit 4: Cell Structure and Processes

Science - Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Cell structure and function • Structure, function and interrelatedness of cell organelles • Eukaryotic cells and prokaryotic cells Cellular processes • Characteristics of life regulated by cellular processes, Cellular genetics, cellular division • biosynthesis of macromolecules, virtual interactive activities and simulations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Microscope lab, Cell structure & function lab, surface area/volume dice lab, cell floor model activity, virtual urchin microscope measurement)

(Virtual osmosis lab, Kinesthetic Mitosis/Meiosis, virtual cancer lab, Henrietta Lacks 3-level guided reading)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Recognize cell size parameters and connect to other levels of organization in living things. Identify differences between types of cells, their functions, and that of the cell structures and related processes. Connect cell structures to production of biomolecules.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit/chapter tests

Skills to be demonstrated: Recognize cell size parameters and connect to other levels of organization in living things. Identify differences between types of cells, their functions, and that of the cell structures and related processes. Connect cell structures to production of biomolecules.

Vocabulary quizzes

Henrietta Lacks debate

STANDARDS

Ohio - High School - Nature of Science	
NS.1.	
Scientific Inquiry, Practice and Applications	
NS.1.1	
Identify questions and concepts that guide scientific investigations.	
NS.1.2	
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.	
NS.1.3	

Unit 4: Cell Structure and Processes

Science - Biology - Last Updated on June 30, 2023

Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
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Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.

Unit 4: Cell Structure and Processes

Science - Biology - Last Updated on June 30, 2023

NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
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NS.4.3

Unit 4: Cell Structure and Processes

Science - Biology - Last Updated on June 30, 2023

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NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
Ohio - High School - Biology
B.C.1.a
Cell structure and function: Structure, function and interrelatedness of cell organelles
B.C.1.b
Cell structure and function: Eukaryotic cells and prokaryotic cells
B.C.2.a
Cellular processes: Characteristics of life regulated by cellular processes

Unit 5: Genetics & Human Heredity

Science - Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Heredity, Genetic mechanisms and inheritance, Modern genetics

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Virtual labs, human inheritance lab, various inheritance pattern problems, easter egg genetics, virtual karyotype activity, polygenic pom pom, rolling the dice lab), virtual interactive activities and simulations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Recognize various genetic inheritance patterns, differences and similarities. Predict results of crosses between various organisms based on genotype and phenotype differences and inheritance patterns. Identify factors outside of genetics that influence phenotypes.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit tests

Skills to be demonstrated:

Recognize various genetic inheritance patterns, differences and similarities. Predict results of crosses between various organisms based on genotype and phenotype differences and inheritance patterns. Identify factors outside of genetics that influence phenotypes.

Vocabulary quizzes

STANDARDS

Ohio - High School - Nature of Science	
NS.1.	
Scientific Inquiry, Practice and Applications	
NS.1.1	
Identify questions and concepts that guide scientific investigations.	
NS.1.2	
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.	
NS.1.3	

Unit 5: Genetics & Human Heredity

Science - Biology - Last Updated on June 30, 2023

Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
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NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.

Unit 5: Genetics & Human Heredity

Science - Biology - Last Updated on June 30, 2023

NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
Science is a Human Endeavor
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.2

Unit 5: Genetics & Human Heredity

Science - Biology - Last Updated on June 30, 2023

Science includes the process of comparing patterns of evidence with current theory.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio - High School - Biology
B.H
HEREDITY
B.H.1
Cellular genetics
B.H.3
Genetic mechanisms and inheritance
B.H.4
Mutations
B.H.5
Modern genetics
B.E.1.b
Mechanisms: Mutation
B.DI.1.a
Biodiversity: Genetic diversity
B.C.2.a
Cellular processes: Characteristics of life regulated by cellular processes

Unit 6: DNA and Protein Synthesis

Science - Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

DNA & Protein Synthesis Structure and function of DNA in cells, Mutations, biotechnology

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (DNA structure & replication lab, protein beast, protein synthesis and words, real genetic code, time to eat lab).

virtual interactive activities and simulations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Describe and identify the structures of DNA molecules. Accurately transcribe and translate genes. Identify different types of mutations, their causes, and results.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit tests

Skills to be demon

strated:

Describe and identify the structures of DNA molecules. Accurately transcribe and translate genes. Identify different types of mutations, their causes, and results.

Vocabulary quizzes

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4

Unit 6: DNA and Protein Synthesis

Science - Biology - Last Updated on June 30, 2023

Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
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Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
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Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.

Unit 6: DNA and Protein Synthesis

Science - Biology - Last Updated on June 30, 2023

NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
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Unit 6: DNA and Protein Synthesis

Science - Biology - Last Updated on June 30, 2023

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Ohio - High School - Biology
B.H
HEREDITY
B.H.2
Structure and function of DNA in cells
B.H.3
Genetic mechanisms and inheritance
B.H.4
Mutations
B.E.1.b
Mechanisms: Mutation
B.DI.1.a
Biodiversity: Genetic diversity
B.C.2.a
Cellular processes: Characteristics of life regulated by cellular processes
B.C.1.a
Cell structure and function: Structure, function and interrelatedness of cell organelles

Unit 7: Evolution

Science - Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

EVOLUTION- Mechanisms • Natural selection • Mutation • Genetic drift • Gene flow (immigration, emigration) • Sexual selection Speciation • Biological classification expanded to molecular evidence • Variation of organisms within species due to population genetics and gene frequency

DIVERSITY AND INTERDEPENDENCE OF LIFE Biodiversity • Genetic diversity

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Inferring from fossil footprints, allelic frequency rabbit allelic frequency bean lab, Who wants to live a million years game, HHMI bird beak labs, Savvas activities, etc.), virtual interactive activities and simulations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Understand the basic process of evolution and historical development. Recognize and describe four mechanisms of evolution- natural selection, gene flow, genetic drift, and mutation. Differentiate between rates of evolutionary change and circumstances that would influence rates.

Unit 7: Evolution

Science - Biology - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Chapter/unit tests

Skills to be demonstrated:

Understand the basic process of evolution and historical development. Recognize and describe four mechanisms of evolution- natural selection, gene flow, genetic drift, and mutation. Differentiate between rates of evolutionary change and circumstances that would influence rates.

Vocabulary quizzes

STANDARDS

Ohio - High School - Biology	
	B.H.5
Modern genetics	
	B.E
EVOLUTION	
	B.E.1.a
Mechanisms: Natural selection	
	B.E.1.b
Mechanisms: Mutation	
	B.E.1.c
Mechanisms: Genetic drift	
	B.E.1.d
Mechanisms: Gene flow (immigration, emigration)	
	B.E.1.e

Unit 7: Evolution

Science - Biology - Last Updated on June 30, 2023

Mechanisms: Sexual selection
B.E.2.a
Speciation: Biological classification expanded to molecular evidence
B.E.2.b
Speciation: Variation of organisms within species due to population genetics and gene frequency
B.DI.1.b
Biodiversity: Species diversity
Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing

Unit 7: Evolution

Science - Biology - Last Updated on June 30, 2023

NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
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Unit 7: Evolution

Science - Biology - Last Updated on June 30, 2023

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NS.4.5
Improvements in technology allow us to gather new scientific evidence.

Unit 8: Photosynthesis & Cellular Respiration

Science - Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Cell structure and function • Structure, function and interrelatedness of cell organelles • Cellular processes • Characteristics of life regulated by cellular processes • Photosynthesis, chemosynthesis, cellular respiration

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Light spectrum/plant growth virtual lab, leaf structure microscope lab, measuring CO₂ production lab, elodea rate of photosynthesis lab)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify what types of cells and organisms perform various energy processing activities. Identify reactants and products of cellular respiration and photosynthesis, virtual interactive activities and simulations

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit tests

Skills to be demonstrated: Identify what types of cells and organisms perform various energy processing activities. Identify reactants and products of cellular respiration and photosynthesis, virtual interactive activities and simulations

Vocabulary quizzes

STANDARDS

Ohio - High School - Nature of Science
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NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4

Unit 8: Photosynthesis & Cellular Respiration

Science - Biology - Last Updated on June 30, 2023

Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
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NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.

Unit 8: Photosynthesis & Cellular Respiration

Science - Biology - Last Updated on June 30, 2023

NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
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NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3

Unit 8: Photosynthesis & Cellular Respiration

Science - Biology - Last Updated on June 30, 2023

Some science knowledge pertains to probabilities or tendencies.

NS.4.4

Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Ohio - High School - Biology

B.C.1.a

Cell structure and function: Structure, function and interrelatedness of cell organelles

B.C.1.b

Cell structure and function: Eukaryotic cells and prokaryotic cells

B.C.2.a

Cellular processes: Characteristics of life regulated by cellular processes

B.C.2.b

Cellular processes: Photosynthesis, chemosynthesis, cellular respiration, biosynthesis of macromolecules

Science - HS - Honors Biology

Vermilion Local School District

UNITS (8/8 SELECTED)

-  Unit 1: Scientific Method & Characteristics of Living Things
-  Unit 2: Ecosystems
-  Unit 3: Biomolecules
-  Unit 4: Cell Structure and Processes
-  Unit 5: Genetics & Human Heredity
-  Unit 6: DNA and Protein Synthesis
-  Unit 7: Evolution
-  Unit 8: Photosynthesis & Cellular Respiration

SUGGESTED DURATION

5 lessons

35 lessons

20 lessons

35 lessons

30 lessons

15 lessons

30 lessons

15 lessons

Unit 1: Scientific Method & Characteristics of Living Things

Science - HS - Honors Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Scientific Method, experimental design, data analysis, characteristics of living things

Nature of Science, Scientific Inquiry, Practice and Applications, Science is a Way of Knowing, Science is a Human Endeavor, Scientific Knowledge is Open to Revision in Light of New Evidence

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (tetrazolium corn seed lab, Simpsons Scientific Method, 4 dots process of science)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Design and implement a scientific experiment. Gather data, draw conclusions, revise experiments and hypotheses. Recognize the ever changing body of knowledge that is science. Graphic and data analysis

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Embedded in all activities and assessments- Design and implement a scientific experiment. Gather data, draw conclusions, revise experiments and hypotheses. Recognize the ever changing body of knowledge that is science. Graphic and data analysis

Testable Claim Experimental Design- students choose product with marketing claim and design experiments to test claim. I.E. 9/10 dentists....

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).

Unit 1: Scientific Method & Characteristics of Living Things

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.3.2

Unit 1: Scientific Method & Characteristics of Living Things

Science - HS - Honors Biology - Last Updated on June 30, 2023

Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.
Science is a Human Endeavor
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.

Unit 1: Scientific Method & Characteristics of Living Things

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.2.1.a

Make observations and look for patterns.

NS.2.1

Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).

Unit 2: Ecosystems

Science - HS - Honors Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Biodiversity, Species diversity, Ecosystems, Equilibrium and disequilibrium, Carrying capacity, Loss of Diversity, Climate change, Anthropocene effects, Extinction, Invasive species

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Wild Herd of Pinto Beans lab/Estimating Goldfish, Fungi of Chance Creek, Biome Bracket Challenge, Daisy world feedback loops activity, Power of the Pyramids, nutrient cycle stations, Lesson of the Kaibab, ecosystem design project)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define biodiversity and identify factors that determine biodiversity, including the biomes with the greatest and least. Identify a population's carrying capacity from a graph or data set. Analyze data from various human populations and make predictions and create explanations for differences. Cite factors that impact biodiversity and the carrying capacity of a population, including density-dependent and density-independent factors.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit/chapter tests- Define biodiversity and identify factors that determine biodiversity, including the biomes with the greatest and least. Identify a population's carrying capacity from a graph or data set. Analyze data from various human populations and make predictions and create explanations for differences. Cite factors that impact biodiversity and the carrying capacity of a population, including density-dependent and density-independent factors.

Vocabulary quizzes

Biome Bracket Challenge

Ecosystem Design Project

Virtual interactives & simulations- data analysis and case studies

ATTACHMENTS

 Ecosystem Design Project

 Ecosystem Design Project Rubric

 BIOME Bracket Challenge

STANDARDS

Ohio - High School - Biology

B.DI.1.b

Biodiversity: Species diversity

Unit 2: Ecosystems

Science - HS - Honors Biology - Last Updated on June 30, 2023

B.DI.2.a
Ecosystems: Equilibrium and disequilibrium
B.DI.2.b
Ecosystems: Carrying capacity
B.DI.3.a
Loss of Diversity: Climate change
B.DI.3.b
Loss of Diversity: Anthropocene effects
B.DI.3.c
Loss of Diversity: Extinction
B.DI.3.d
Loss of Diversity: Invasive species
Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5

Unit 2: Ecosystems

Science - HS - Honors Biology - Last Updated on June 30, 2023

Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
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Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.

Unit 2: Ecosystems

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
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Unit 2: Ecosystems

Science - HS - Honors Biology - Last Updated on June 30, 2023

Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Unit 3: Biomolecules

Science - HS - Honors Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Cellular processes • Characteristics of life regulated by cellular processes • biosynthesis of macromolecules

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Biomolecule chemical testing, water molecule model lab, fresh fruit jello lab, enzyme controlled reactions lab, Sugar-Not so Sweet Story, Macromolecule Dinner concert reading, Phet pH lab)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify 4 major macromolecule groups, examples, and the functions and structure of groups. Identify properties of water and interactions with macromolecule groups. Identify factors that influence enzyme activity and predict results of changes in these factors.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit/chapter tests- Identify 4 major macromolecule groups, examples, and the functions and structure of groups. Identify properties of water and interactions with macromolecule groups. Identify factors that influence enzyme activity and predict results of changes in these factors.

Virtual interactives & simulations- data analysis and case studies

Vocabulary quizzes

STANDARDS

Ohio - High School - Nature of Science	
NS.1.	Scientific Inquiry, Practice and Applications
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NS.1.2	Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
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Unit 3: Biomolecules

Science - HS - Honors Biology - Last Updated on June 30, 2023

Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
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NS.2.2.a
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Unit 3: Biomolecules

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
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Science can advance through critical thinking about existing evidence.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3

Unit 3: Biomolecules

Science - HS - Honors Biology - Last Updated on June 30, 2023

Some science knowledge pertains to probabilities or tendencies.

NS.4.4

Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Ohio - High School - Biology

B.C.2.b

Cellular processes: Photosynthesis, chemosynthesis, cellular respiration, biosynthesis of macromolecules

Unit 4: Cell Structure and Processes

Science - HS - Honors Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Cell structure and function • Structure, function and interrelatedness of cell organelles • Eukaryotic cells and prokaryotic cells Cellular processes • Characteristics of life regulated by cellular processes, Cellular genetics, cellular division • biosynthesis of macromolecules

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Microscope lab, Cell structure & function lab, surface area/volume dice lab, cell floor model activity, virtual urchin microscope measurement)
(Virtual osmosis lab, Kinesthetic Mitosis/Meiosis, virtual cancer lab, cell processes lock box activity)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Recognize cell size parameters and connect to other levels of organization in living things. Identify differences between types of cells, their functions, and that of the cell structures and related processes. Connect cell structures to production of biomolecules.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit/chapter tests- Recognize cell size parameters and connect to other levels of organization in living things. Identify differences between types of cells, their functions, and that of the cell structures and related processes. Connect cell structures to production of biomolecules.

Vocabulary quizzes

Virtual interactives and simulations- data analysis and case studies

John Snow Lock Box activity- reading, data analysis, transport processes, membrane structure, etc.

STANDARDS

Ohio - High School - Nature of Science	
	NS.1.
Scientific Inquiry, Practice and Applications	
	NS.1.1
Identify questions and concepts that guide scientific investigations.	
	NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.	
	NS.1.3

Unit 4: Cell Structure and Processes

Science - HS - Honors Biology - Last Updated on June 30, 2023

Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.

Unit 4: Cell Structure and Processes

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
Science is a Human Endeavor
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.3

Unit 4: Cell Structure and Processes

Science - HS - Honors Biology - Last Updated on June 30, 2023

Some science knowledge pertains to probabilities or tendencies.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
Ohio - High School - Biology
B.C.1.a
Cell structure and function: Structure, function and interrelatedness of cell organelles
B.C.1.b
Cell structure and function: Eukaryotic cells and prokaryotic cells
B.C.2.a
Cellular processes: Characteristics of life regulated by cellular processes

Unit 5: Genetics & Human Heredity

Science - HS - Honors Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Heredity, Genetic mechanisms and inheritance, Modern genetics

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Virtual labs, human inheritance lab, various inheritance pattern problems, easter egg genetics, blood typing lab, virtual karyotype activity, chi-square lab, rolling the dice lab, genetic disorder project, genetic lock box activity)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Connection of cell division processes to resulting traits and characteristics of organisms. Recognize various genetic inheritance patterns, differences and similarities. Predict results of crosses between various organisms based on genotype and phenotype differences and inheritance patterns. Identify factors outside of genetics that influence phenotypes. Use statistical analysis to determine reliability of conclusions.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit tests- Connection of cell division processes to resulting traits and characteristics of organisms. Recognize various genetic inheritance patterns, differences and similarities. Predict results of crosses between various organisms based on genotype and phenotype differences and inheritance patterns. Identify factors outside of genetics that influence phenotypes. Use statistical analysis to determine reliability of conclusions.

Vocabulary quizzes

Virtual interactives and simulations- data analysis/case studies

Genetic lock box activity-

Recognize various genetic inheritance patterns, differences and similarities. Predict results of crosses between various organisms based on genotype and phenotype differences and inheritance patterns.

Genetic disorder brochure project

ATTACHMENTS

 Genetic Disorders Project

 Genetic Disorder Project Rubric

STANDARDS

Ohio - High School - Nature of Science

NS.1.

Unit 5: Genetics & Human Heredity

Science - HS - Honors Biology - Last Updated on June 30, 2023

Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.

Unit 5: Genetics & Human Heredity

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
Science is a Human Endeavor
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.3.4

Unit 5: Genetics & Human Heredity

Science - HS - Honors Biology - Last Updated on June 30, 2023

Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio - High School - Biology
B.H
HEREDITY
B.H.1
Cellular genetics
B.H.3
Genetic mechanisms and inheritance
B.H.4
Mutations
B.H.5
Modern genetics

Unit 5: Genetics & Human Heredity

Science - HS - Honors Biology - Last Updated on June 30, 2023

B.E.1.b
Mechanisms: Mutation
B.DI.1.a
Biodiversity: Genetic diversity
B.C.2.a
Cellular processes: Characteristics of life regulated by cellular processes

Unit 6: DNA and Protein Synthesis

Science - HS - Honors Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

DNA & Protein Synthesis Structure and function of DNA in cells, Mutations, biotechnology

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Virtual labs, DNA structure & replication lab, protein synthesis and words, real genetic code, protein beast creation project)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Describe and identify the structures of DNA molecules. Accurately transcribe and translate genes. Identify different types of mutations, their causes, and results. Recognize basic steps of biotechnology and applications.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit tests-

Describe and identify the structures of DNA molecules. Accurately transcribe and translate genes. Identify different types of mutations, their causes, and results. Recognize basic steps of biotechnology and applications.

Virtual interactives and simulations- data analysis/case studies

Vocabulary quizzes

Protein Beast creation project- construct imaginary creature and reverse engineer to construct DNA associated with chosen characteristics

ATTACHMENTS

 protein beast creation.pdf

STANDARDS

Ohio - High School - Nature of Science

NS.1.

Scientific Inquiry, Practice and Applications

NS.1.1

Identify questions and concepts that guide scientific investigations.

NS.1.2

Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.

Unit 6: DNA and Protein Synthesis

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
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Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by

Unit 6: DNA and Protein Synthesis

Science - HS - Honors Biology - Last Updated on June 30, 2023

using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
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NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.4.1
Science can advance through critical thinking about existing evidence.

Unit 6: DNA and Protein Synthesis

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio - High School - Biology
B.H
HEREDITY
B.H.2
Structure and function of DNA in cells
B.H.3
Genetic mechanisms and inheritance
B.H.4
Mutations
B.E.1.b
Mechanisms: Mutation
B.DI.1.a
Biodiversity: Genetic diversity
B.C.2.a
Cellular processes: Characteristics of life regulated by cellular processes
B.C.1.a

Unit 6: DNA and Protein Synthesis

Science - HS - Honors Biology - Last Updated on June 30, 2023

Cell structure and function: Structure, function and interrelatedness of cell organelles

Unit 7: Evolution

Science - HS - Honors Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

EVOLUTION- Mechanisms • Natural selection • Mutation • Genetic drift • Gene flow (immigration, emigration) • Sexual selection Speciation • Biological classification expanded to molecular evidence • Variation of organisms within species due to population genetics and gene frequency

DIVERSITY AND INTERDEPENDENCE OF LIFE Biodiversity • Genetic diversity

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings
(Inferring from fossil footprints, allelic frequency rabbit allelic frequency bean lab, Days of Dysevolution, HHMI bird beak labs, biochemical evidence for evolution lab, PBS learning media virtual labs, Cladogram activities, sorting HHMI shells activity)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Understand the basic process of evolution and historical development. Recognize and describe four mechanisms of evolution- natural selection, gene flow, genetic drift, and mutation. Differentiate between rates of evolutionary change and circumstances that would influence rates. Identify bodies of evidence for evolutionary theory and connect these types of evidence to the construction of phylogenetic trees.

Unit 7: Evolution

Science - HS - Honors Biology - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Chapter/unit tests-

Understand the basic process of evolution and historical development. Recognize and describe four mechanisms of evolution- natural selection, gene flow, genetic drift, and mutation. Differentiate between rates of evolutionary change and circumstances that would influence rates. Identify bodies of evidence for evolutionary theory and connect these types of evidence to the construction of phylogenetic trees.

Vocabulary quizzes

Virtual interactives and simulations- data analysis/case studies

STANDARDS

Ohio - High School - Biology	
	B.H.5
Modern genetics	
	B.E
EVOLUTION	
	B.E.1.a
Mechanisms: Natural selection	
	B.E.1.b
Mechanisms: Mutation	
	B.E.1.c
Mechanisms: Genetic drift	
	B.E.1.d
Mechanisms: Gene flow (immigration, emigration)	
	B.E.1.e

Unit 7: Evolution

Science - HS - Honors Biology - Last Updated on June 30, 2023

Mechanisms: Sexual selection
B.E.2.a
Speciation: Biological classification expanded to molecular evidence
B.E.2.b
Speciation: Variation of organisms within species due to population genetics and gene frequency
B.DI.1.b
Biodiversity: Species diversity
Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing

Unit 7: Evolution

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.

Unit 7: Evolution

Science - HS - Honors Biology - Last Updated on June 30, 2023

Science is a Human Endeavor
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.

Unit 8: Photosynthesis & Cellular Respiration

Science - HS - Honors Biology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Cell structure and function • Structure, function and interrelatedness of cell organelles • Cellular processes • Characteristics of life regulated by cellular processes • Photosynthesis, chemosynthesis, cellular respiration

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings (Light spectrum/plant growth virtual lab, leaf structure microscope lab, measuring CO₂ production lab, elodea rate of photosynthesis lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify what types of cells and organisms perform various energy processing activities. Connect processes to cellular structures. Identify reactants and products of cellular respiration and photosynthesis.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit tests-

Identify what types of cells and organisms perform various energy processing activities. Connect processes to cellular structures. Identify reactants and products of cellular respiration and photosynthesis.

Vocabulary quizzes

Virtual interactives & simulations- data analysis and case studies

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).

Unit 8: Photosynthesis & Cellular Respiration

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
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Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b

Unit 8: Photosynthesis & Cellular Respiration

Science - HS - Honors Biology - Last Updated on June 30, 2023

Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
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NS.4.2
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NS.4.3
Some science knowledge pertains to probabilities or tendencies.

Unit 8: Photosynthesis & Cellular Respiration

Science - HS - Honors Biology - Last Updated on June 30, 2023

NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio - High School - Biology
B.C.1.a
Cell structure and function: Structure, function and interrelatedness of cell organelles
B.C.1.b
Cell structure and function: Eukaryotic cells and prokaryotic cells
B.C.2.a
Cellular processes: Characteristics of life regulated by cellular processes
B.C.2.b
Cellular processes: Photosynthesis, chemosynthesis, cellular respiration, biosynthesis of macromolecules

Science - Chemistry

Vermilion Local School District

UNITS (8/8 SELECTED)

-  Unit 1: Matter
-  Unit 2: Energy and States - Part 1
-  Unit 3: Energy and States - Part 2
-  Unit 4: Describing Substances
-  Unit 5: Counting
-  Unit 6: Internal Structure
-  Unit 7: Representing Chemical Changes
-  Unit 8: Stoichiometry

SUGGESTED DURATION

33 lessons

19 lessons

18 lessons

18 lessons

18 lessons

20 lessons

20 lessons

20 lessons

Unit 1: Matter

Science - Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Scientific Method & Measurements, Significant Figures, Mass, Volume, Density, Graphing

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Mass and Change Lab, Comparing Volume Units Lab, Mass and Volume Lab, Density of a Gas Lab, Thickness of Aluminum Foil Lab, notes, small group discussion, whole class discussion, white board meetings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Know the steps of the scientific method & be able to properly estimates measurements, use and distinguish significant figures, define mass and volume and density, be able to graph mass versus volume, draw particle models depicting a substances mass and volume

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Quizzes, Unit 1 Test

STANDARDS

Ohio Extended - Grades 9-12 - Chemistry
CHM.912.1c
Identify that all matter is made of atoms.
Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).

Unit 1: Matter

Science - Chemistry - Last Updated on June 30, 2023

NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b

Unit 1: Matter

Science - Chemistry - Last Updated on June 30, 2023

Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
Science is a Human Endeavor
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Scientific Knowledge is Open to Revision in Light of New Evidence
NS.4.1
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NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.

Unit 1: Matter

Science - Chemistry - Last Updated on June 30, 2023

NS.4.4

Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Unit 2: Energy and States - Part 1

Science - Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Kinetic energy, gas laws, pressure, volume, temperature, solving for a variable

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, small group discussion, whole class discussion, white board meetings, videos, diffusion of gases, how a thermometer works demonstration, gas laws labs. bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define kinetic energy, pressure, volume, temperature. Be able to mathematically use the gas laws equations to predict changes in a system. Draw particle models demonstrating substances

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Quizzes

Lab Report, Unit 2 Test

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6

Unit 2: Energy and States - Part 1

Science - Chemistry - Last Updated on June 30, 2023

Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.

Unit 2: Energy and States - Part 1

Science - Chemistry - Last Updated on June 30, 2023

NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
Science is a Human Endeavor
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5

Unit 2: Energy and States - Part 1

Science - Chemistry - Last Updated on June 30, 2023

Improvements in technology allow us to gather new scientific evidence.

Ohio Extended - Grades 9-12 - Chemistry

CHM.912.1b

Identify a diagram or model of an atom.

CHM.912.1c

Identify that all matter is made of atoms.

CHM.912.6a

Identify measurements of gases (volume, temperature and pressure).

Unit 3: Energy and States - Part 2

Science - Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Kinetic energy and potential energy, physical changes, solving for a variable

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, small group discussion, whole class discussion, white board meetings, videos, bellringers, Icy Hot Lab, Phase Change Lab, Melting Blocks Demonstration

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define kinetic energy and potential energy, heating and cooling curves, ability to determine the difference between what is happening at the particle level when substances go through a phase change and a temperature change

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Quizzes, Unit 3 Test

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
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Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.

Unit 3: Energy and States - Part 2

Science - Chemistry - Last Updated on June 30, 2023

NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
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Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4

Unit 3: Energy and States - Part 2

Science - Chemistry - Last Updated on June 30, 2023

The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.

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NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Unit 3: Energy and States - Part 2

Science - Chemistry - Last Updated on June 30, 2023

Ohio Extended - Grades 9-12 - Chemistry	
	CHM.912.1b
Identify a diagram or model of an atom.	
	CHM.912.1c
Identify that all matter is made of atoms.	

Unit 4: Describing Substances

Science - Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Distinguishing pure substances from mixtures, elements and compounds, determination of chemical formulas of compounds

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Pure substances vs. mixtures discussion, Electrolysis of water, barking test tubes, notes, small group discussion, whole class discussion, white board meetings, videos,

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Distinguish between pure substance and mixtures. Use characteristic properties to separate a mixture. Distinguish elements from compounds. Cite evidence indicating compounds occur in a definite ratio. Use evidence from combining volumes to deduce formulas of some compounds.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 4 Quiz

Element Tile Project

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6

Unit 4: Describing Substances

Science - Chemistry - Last Updated on June 30, 2023

Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
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Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.

Unit 4: Describing Substances

Science - Chemistry - Last Updated on June 30, 2023

NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
Science is a Human Endeavor
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Science depends on curiosity, imagination, creativity and persistence.
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Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5

Unit 4: Describing Substances

Science - Chemistry - Last Updated on June 30, 2023

Improvements in technology allow us to gather new scientific evidence.
Ohio Extended - Grades 9-12 - Chemistry
CHM.912.2a
Represent a chemical compound with a ball and stick model or chemical formula.
CHM.912.1b
Identify a diagram or model of an atom.
CHM.912.1c
Identify that all matter is made of atoms.
CHM.912.2c
Identify that two elements combine to form a compound.

Unit 5: Counting

Science - Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

ACT Prep, Relative Mass, Molar Conversions, Percent Composition, Empirical Formula, Molecular Formula, Ionic vs. Covalent Compounds, Particles containing, protons, neutrons and electrons.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Relative mass lab, Empirical Formula Lab, Gum Lab (percent composition), Mole Scavenger Hunt, notes, small group discussion, whole class discussion, white board meetings, videos, bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define relative mass and learn how to mathematically determine the relative mass of elements on the periodic table. Be able to convert grams/atoms of a substance to moles of that substance and vice versa. Be able to calculate the percent composition of a compound. Define empirical formula and molecular formula. Calculate the empirical and molecular formula of a compound

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 5 Test
Quizzes

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4

Unit 5: Counting

Science - Chemistry - Last Updated on June 30, 2023

Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
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NS.2.1.c
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NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.

Unit 5: Counting

Science - Chemistry - Last Updated on June 30, 2023

NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
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The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
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NS.4.3

Unit 5: Counting

Science - Chemistry - Last Updated on June 30, 2023

Some science knowledge pertains to probabilities or tendencies.

NS.4.4

Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Ohio Extended - Grades 9-12 - Chemistry

CHM.912.1b

Identify a diagram or model of an atom.

Unit 6: Internal Structure

Science - Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

ACT Prep, Ionic vs. Covalent Compounds, Particles containing, protons, neutrons and electrons. Chemical nomenclature

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Sticky Tape Lab, Conductivity of solutions and substances lab, Electrolysis of copper(II) chloride, notes, small group discussion, whole class discussion, white board meetings, videos, bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Chemical nomenclature of ionic and covalent compounds, Ionic vs. Covalent Compounds, Particles containing, protons, neutrons and electrons. Nomenclature.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 6 Test
Quizzes

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.

Unit 6: Internal Structure

Science - Chemistry - Last Updated on June 30, 2023

NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
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NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
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NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3

Unit 6: Internal Structure

Science - Chemistry - Last Updated on June 30, 2023

Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
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NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

Unit 6: Internal Structure

Science - Chemistry - Last Updated on June 30, 2023

NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio Extended - Grades 9-12 - Chemistry
CHM.912.2a
Represent a chemical compound with a ball and stick model or chemical formula.
CHM.912.1a
Identify parts of an atom (protons, neutrons, electrons).
CHM.912.2b
Identify that a ball and stick model or chemical formula represents a chemical compound.
CHM.912.1c
Identify that all matter is made of atoms.
CHM.912.2c
Identify that two elements combine to form a compound.

Unit 7: Representing Chemical Changes

Science - Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Chemical Reactions, evidence of chemical change, Law of Conservation of Mass, Reaction Types, Balance chemical equations, Endothermic and exothermic reactions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Nail Lab, Reaction Types Lab, notes, small group discussion, whole class discussion, white board meetings, videos, bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Show evidence of chemical reactions, evidence of chemical change, Law of Conservation of Mass. Be able to identify the 5 basic reaction types, Balance chemical equations, Identify reactions as either endothermic or exothermic.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 7 Test
Lab Report
Quizzes

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.

Unit 7: Representing Chemical Changes

Science - Chemistry - Last Updated on June 30, 2023

NS.1.6
Communicate and support scientific arguments.
NS.2.
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Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
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Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3

Unit 7: Representing Chemical Changes

Science - Chemistry - Last Updated on June 30, 2023

Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
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Unit 7: Representing Chemical Changes

Science - Chemistry - Last Updated on June 30, 2023

NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio Extended - Grades 9-12 - Chemistry
CHM.912.4a
Identify the reactants and the products in a chemical reaction (e.g., Ingredients/bread)
CHM.912.4b
Perform a chemical reaction (baking soda and vinegar).
CHM.912.4c
Identify common chemical reactions (e.g., cooking, burning).

Unit 8: Stoichiometry

Science - Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Stoichiometry, percent yield, limiting reactant

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Copper-silver nitrate lab, Smore Stoichiometry , Conservation of mass during a chemical reaction lab, molar volume of a gas, notes, small group discussion, whole class discussion, white board meetings, videos, bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define stoichiometry, percent yield, limiting reactant. Calculate the amount of reactants and products using stoichiometry.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 8 Test
Quizzes
Final Exam

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6

Unit 8: Stoichiometry

Science - Chemistry - Last Updated on June 30, 2023

Communicate and support scientific arguments.
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NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.

Unit 8: Stoichiometry

Science - Chemistry - Last Updated on June 30, 2023

NS.2.4
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Unit 8: Stoichiometry

Science - Chemistry - Last Updated on June 30, 2023

Improvements in technology allow us to gather new scientific evidence.

Ohio Extended - Grades 9-12 - Chemistry

CHM.912.4a

Identify the reactants and the products in a chemical reaction (e.g., Ingredients/bread)

CHM.912.4b

Perform a chemical reaction (baking soda and vinegar).

CHM.912.4c

Identify common chemical reactions (e.g., cooking, burning).

Science - Astronomy

Vermilion Local School District

UNITS (9/9 SELECTED)		SUGGESTED DURATION
	Unit 1: The Night Sky and The History of Modern Astronomy	20 lessons
	Unit 2: Electromagnetic Spectrum and Telescopes	20 lessons
	Unit 3: The Planets	20 lessons
	Unit 4: Space Debris	20 lessons
	Unit 5: The Sun and Stars	20 lessons
	Unit 6: Life Cycle of Stars	20 lessons
	Unit 7: Neutron Stars and Black Holes	20 lessons
	Unit 8: The Milky Way and Other Galaxies	20 lessons
	Unit 9: Cosmology	20 lessons

Unit 1: The Night Sky and The History of Modern Astronomy

Science - Astronomy - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

The night sky and the history of modern astronomy

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Celestial Sphere
Constellations
Brightness of stars
Seasons
Copernicus, Galileo and Newton

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Sky charts, lost on the moon, graphing tides. Labs, homework (book work and worksheets), research and discussion, Unit tests and Vocabulary Quizzes

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.2.1.a
Make observations and look for patterns.
NS.2.
Science is a Way of Knowing
Ohio Extended - Grades 9-12 - Physical Science
PS-H.912.19c

Unit 1: The Night Sky and The History of Modern Astronomy

Science - Astronomy - Last Updated on June 30, 2023

Recognize that stars form from clouds of gas.
PS-H.912.12c
Recognize that many stars make up a galaxy.

Unit 2: Electromagnetic Spectrum and Telescopes

Science - Astronomy - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Electromagnetic spectrum and telescopes

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Wavelengths and Energy

Reflecting, refracting and radio telescopes

Interferometry

Spectrography

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Fingerprinting the stars. Chemistry of Auroras. Telescope research. Labs, homework (book work and worksheets), research and discussion, Unit tests and Vocabulary Quizzes

STANDARDS

Ohio Extended - Grades 9-12 - Physical Science

PS-H.912.19c

Recognize that stars form from clouds of gas.

PS-H.912.12c

Recognize that many stars make up a galaxy.

PS-H.912.7a

Construct a circuit with two or more components (e.g., light bulb, motor, battery).

PS-H.912.6a

Describe how different colors of objects absorb thermal energy differently.

PS-H.912.5a

Describe light and sound as traveling in waves.

Ohio - High School - Nature of Science

NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Unit 2: Electromagnetic Spectrum and Telescopes

Science - Astronomy - Last Updated on June 30, 2023

NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.

Unit 3: The Planets

Science - Astronomy - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

The planets. Solar nebula theory. Condensation sequence

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Terrestrial Planets
Jovian Planets
Condensation Sequence
Solar Nebula Theory

Unit 3: The Planets

Science - Astronomy - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Planet project. How did the solar system form. Labs, homework (book work and worksheets), research and discussion, Unit tests and Vocabulary Quizzes

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.2.
Science is a Way of Knowing
NS.1.6
Communicate and support scientific arguments.
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.

Unit 3: The Planets

Science - Astronomy - Last Updated on June 30, 2023

NS.2.1.b

Determine relevant independent variables affecting observed patterns.

STANDARDS

Unit 4: Space Debris

Science - Astronomy - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Asteroids, Comets, and Meteors

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Asteroids, Comets, Meteors, Meteorites, Meteoroids.

Asteroid Belt

Kuiper Belt

Oort Cloud

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Comet research, Asteroid, comet, meteor comparison. Labs, homework (book work and worksheets), research and discussion, Unit tests and Vocabulary Quizzes

STANDARDS

Ohio - High School - Nature of Science	
NS.1.	
Scientific Inquiry, Practice and Applications	
NS.1.1	
Identify questions and concepts that guide scientific investigations.	
NS.1.2	
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.	
NS.1.3	
Use technology and mathematics to improve investigations and communications.	
NS.1.4	
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).	
NS.2.	
Science is a Way of Knowing	
NS.2.1	

Unit 4: Space Debris

Science - Astronomy - Last Updated on June 30, 2023

Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).

NS.2.1.a

Make observations and look for patterns.

NS.2.1.b

Determine relevant independent variables affecting observed patterns.

NS.2.1.c

Manipulate an independent variable to affect a dependent variable.

NS.2.1.d

Conduct an experiment with controlled variables based on a question or hypothesis.

NS.2.1.e

Analyze data graphically and mathematically.

Unit 5: The Sun and Stars

Science - Astronomy - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

The sun and stars. HR Diagrams

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

HR Diagrams
Helioseismology

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Types of stars activity. HR Diagram project. Labs, homework (book work and worksheets), research and discussion, Unit tests and Vocabulary Quizzes

STANDARDS

Ohio Extended - Grades 9-12 - Physical Science
PS-H.912.19c
Recognize that stars form from clouds of gas.
PS-H.912.12c
Recognize that many stars make up a galaxy.
PS-H.912.13b
Identify “mass” as the property that determines the life cycle of a star.
PS-H.912.13a
Match a star of a specific relative mass (e.g., low, medium, high) with its life cycle.
Ohio - High School - Nature of Science
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4

Unit 5: The Sun and Stars

Science - Astronomy - Last Updated on June 30, 2023

The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.

Unit 6: Life Cycle of Stars

Science - Astronomy - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Life cycle of stars, mass, brightness, diameter, fuel of stars

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Supernovae
Planetary Nebula
Hydrostatic Equilibrium

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Stellar Evolution lab. Labs, homework (book work and worksheets), research and discussion, Unit tests and Vocabulary Quizzes

STANDARDS

Ohio Extended - Grades 9-12 - Physical Science
PS-H.912.19c
Recognize that stars form from clouds of gas.
PS-H.912.12c
Recognize that many stars make up a galaxy.
PS-H.912.13b
Identify “mass” as the property that determines the life cycle of a star.
PS-H.912.13a
Match a star of a specific relative mass (e.g., low, medium, high) with its life cycle.
Ohio - High School - Nature of Science
NS.4.5
Improvements in technology allow us to gather new scientific evidence.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.3

Unit 6: Life Cycle of Stars

Science - Astronomy - Last Updated on June 30, 2023

Some science knowledge pertains to probabilities or tendencies.

NS.4.2

Science includes the process of comparing patterns of evidence with current theory.

NS.4.1

Science can advance through critical thinking about existing evidence.

Unit 7: Neutron Stars and Black Holes

Science - Astronomy - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Neutron Stars and Black holes.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Schwarzschild Radius

Event Horizon

Escape Velocity

Gravity Waves

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Black hole newsletter, black hole sizes. Labs, homework (book work and worksheets), research and discussion, Unit tests and Vocabulary Quizzes

STANDARDS

Ohio Extended - Grades 9-12 - Physical Science

PS-H.912.19c

Recognize that stars form from clouds of gas.

PS-H.912.12c

Recognize that many stars make up a galaxy.

PS-H.912.13b

Identify “mass” as the property that determines the life cycle of a star.

PS-H.912.13a

Match a star of a specific relative mass (e.g., low, medium, high) with its life cycle.

Ohio - High School - Nature of Science

NS.1.

Scientific Inquiry, Practice and Applications

NS.1.1

Identify questions and concepts that guide scientific investigations.

Unit 7: Neutron Stars and Black Holes

Science - Astronomy - Last Updated on June 30, 2023

NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.

Unit 8: The Milky Way and Other Galaxies

Science - Astronomy - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

The milky way and other galaxies

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Sampling
Tuning Fork Diagram
ZooUniverse
Deep Field Images

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Labs, homework (book work and worksheets), research and discussion, Unit tests and Vocabulary Quizzes

STANDARDS

Ohio Extended - Grades 9-12 - Physical Science
PS-H.912.19c
Recognize that stars form from clouds of gas.
PS-H.912.12c
Recognize that many stars make up a galaxy.
PS-H.912.11c
Recognize that the universe is expanding.
PS-H.912.12b
Match two galaxies of the same type (e.g., spiral, elliptical).
Ohio - High School - Nature of Science
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.2

Unit 8: The Milky Way and Other Galaxies

Science - Astronomy - Last Updated on June 30, 2023

Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.

NS.2.1.e

Analyze data graphically and mathematically.

Unit 9: Cosmology

Science - Astronomy - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Cosmology

Big Bang

Big Crunch

Big Rip

Big Freeze

Dark Matter and Dark Energy

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Big Bang

Big Crunch

Big Rip

Big Freeze

Dark Matter and Dark Energy

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Big Bang Tic-Tac-Toe. Labs, homework (book work and worksheets), research and discussion, Unit tests and Vocabulary Quizzes

STANDARDS

Science - Forensic Investigations

Vermilion Local School District

UNITS (5/5 SELECTED)	SUGGESTED DURATION
 Unit 1: Unit 1: Fingerprinting (20 lessons)	<i>20 lessons</i>
 Unit 2: Unit 2 Handwriting (25 lessons)	<i>25 lessons</i>
 Unit 3: Unit 3: Human Remains	<i>15 lessons</i>
 Unit 4: Unit 4: Drug Analysis, Soil Analysis and Urinalysis	<i>20 lessons</i>
 Unit 5: Unit 4.5 (10 lessons) Serial Killer Project, Misc Prints, Final Crime Scene	<i>10 lessons</i>

Unit 1: Unit 1: Fingerprinting (20 lessons)

Science - Forensic Investigations - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Fingerprints

Using the New Generation Science Practices as a guide, the topic of Fingerprint Analysis used at a crime scene

For reference the New Generation Science Practices

1. Ask Scientific ?
2. Dev and use Models as a predictive tool
3. Plan and carry out scientific investigation
4. Analyze and interpret data
5. Use math and computational thinking
6. Construct explanations
7. Create an argument based on scientifically gathered evidence
8. Obtain, evaluate and communicate information

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, Fingerprinting Labs and start up Serial Killer Project

Formative Assessment checks throughout on note taking and project with Pear Deck

Serial Killer Project

Weekly Podcast

Labs and Activities

Loops Whorl Arches, Classifying finger printing and fingerprint collection worksheets and information sheets

Fingerprinting Labs

Loops, Whorls, arches, Dusting for prints, Ninhydrin, Iodine analysis, Super Glue Chamber and 5 prints around the building

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion

To use the fingerprinting testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Generation Skills used 1,2,3,4,5,6,7,8

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with hands on portion

Fingerprinting Labs and lab write ups

STANDARDS

Ohio - High School - Biology

Unit 1: Unit 1: Fingerprinting (20 lessons)

Science - Forensic Investigations - Last Updated on June 30, 2023

B.H.2
Structure and function of DNA in cells
B.H.5
Modern genetics
Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.6
Communicate and support scientific arguments.
NS.2.1.a
Make observations and look for patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.

Unit 2: Unit 2 Handwriting (25 lessons)

Science - Forensic Investigations - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Handwriting-Time of 4 to 5 weeks

Using the New Generation Science Practices as a guide, the topic of Handwriting Analysis used at a crime scene as individual evidence

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes and formative assessments checks of notes with Pear Deck

12 Characteristic of HW worksheet and information sheets

Minuate information sheet

Handwriting ID information sheet

Labs: 12 Characteristics of HW, Erasure lab, Indentation lab, Ink Chromatography lab, Iodine Lab, HW ID Lab, Angle of Template Lab, Analysis of Paper Lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Handwriting

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion with next steps

To use the handwriting testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Generation Skills used 1,2,3,4,5,6,7,8

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with hands on portion

Labs and lab write ups

STANDARDS

Unit 3: Unit 3: Human Remains

Science - Forensic Investigations - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Using the New Generation Science Practices as a guide, the topic of bone and tissue Analysis used at a crime scene (15 lessons)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Human Remains notes

Labs: Determining Sex, Bones, And Height worksheets and information sheets

Bone inventory, Height lab, Determining Sex lab, Bones in a bag, Number of Victims, Bone Skeleton and Bone Id, Estimated Height of Victims, Estimated time of death

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Continue the Serial Killer Project	Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion
Human Remains notes	
Determining Sex, Bones, And Height worksheets and information sheets	To use the bone and tissue testing data collected in the various labs and come up with conclusions for that data
Labs: Bone inventory, Height lab, Determining Sex lab, Bones in a bag, Number of Victims, Bone Skeleton and Bone Id, Estimated Height of Victim, Estimated time of death	Take a crime scene scenarios and use the skills needed to solve the scenario
	Generation Skills used 1,2,3,4,5,6,7,8

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Human Remains

Unit Test with hands on portion
Labs and lab write ups

STANDARDS

Ohio - High School - Biology
B.H
HEREDITY
B.H.2
Structure and function of DNA in cells

Unit 3: Unit 3: Human Remains

Science - Forensic Investigations - Last Updated on June 30, 2023

B.H.3
Genetic mechanisms and inheritance
B.E
EVOLUTION

Unit 4: Unit 4: Drug Analysis, Soil Analysis and Urinalysis

Science - Forensic Investigations - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Drug and Urinalysis and Soil Analysis

Using the New Generation Science Practices as a guide, the topic of Drugs, urine and soil Analysis used at a crime

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Drugs and Urinalysis

Notes and Formative Assessments as we progress using Pear Deck

Labs: Spot Plate and the OTC lab, urinalysis lab looking for ETOH and THC, Narcotic Lab testing, white Powder lab testing

Soil: Notes

Soil Labs: Soil Analysis of area samples

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion

To use the the three forms testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Generation Skills used 1,2,3,4,5,6,7,8

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Drugs and Urinalysis and Soil

Unit Test with hands on portion

Labs and lab write ups for all three units

STANDARDS

Unit 5: Unit 4.5 (10 lessons) Serial Killer Project, Misc Prints, Final Crime Scene

Science - Forensic Investigations - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Misc Prints and wrap up Serial Killer Project

Hands on Final Crime Scene

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Misc Print Notes

Labs: Lip print Lab, Shoe size vs height lab, Shoe casing Lab, Tool print lab, and if time Bite Mark Lab

Presentation

Final Crime Scene

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion

To use the print testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Presentation

Generation Skills used 1,2,3,4,5,6,7,8

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Labs and lab write ups

Project_ Presentation, Poster and Paper

Hand on Crime Scene Final. Use all knowledge collected in Semester to Solve the Crime Scene that is set up

STANDARDS

Science - Forensics and Law

Vermilion Local School District

UNITS (5/5 SELECTED)	SUGGESTED DURATION
<div></div> Unit 1: Unit 1: Blood Analysis	20 lessons
<div></div> Unit 2: Unit 2 Blood Analysis (5 lessons) and DNA Analysis (15 lessons)	20 lessons
<div></div> Unit 3: Unit 3: Glass (10 lessons) Start of Animal and Human Hairs (10 lessons)	20 lessons
<div></div> Unit 4: Unit 4 Human Hair P 2 (10 lessons) Locard's Principle (5 lessons) Start Fiber Analysis (5 lessons)	20 lessons
<div></div> Unit 5: Unit 4.5 (10 lessons) Famous Case Project and Final Crime Scene	10 lessons

Unit 1: Unit 1: Blood Analysis

Science - Forensics and Law - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Using the New Generation Science Practices as a guide, the topic of **Blood Analysis, Serology**, used at a crime scene

For reference the New Generation Science Practices

1. Ask Scientific ?
2. Dev and use Models as a predictive tool
3. Plan and carry out scientific investigation
4. Analyze and interpret data
5. Use math and computational thinking
6. Construct explanations
7. Create an argument based on scientifically gathered evidence
8. Obtain, evaluate and communicate information

5 weeks- 25 lessons

STANDARDS

Ohio - High School - Biology
B.H.2
Structure and function of DNA in cells
B.C
CELLS
Ohio - High School - Chemistry
C.PM
STRUCTURE AND PROPERTIES OF MATTER
C.PM.3.b
Chemical bonding: Polar/covalent
C.IM.1.a
Chemical reactions: Types of reactions
Ohio - High School - Physical Science
PS.M
STUDY OF MATTER
PS.M.1.a

Unit 1: Unit 1: Blood Analysis

Science - Forensics and Law - Last Updated on June 30, 2023

Classification of matter: Heterogeneous vs. homogeneous
Ohio - High School - Physics
P.M
MOTION
P.M.3.a
Projectile Motion: Independence of horizontal and vertical motion
P.F.1
Newton's laws applied to complex problems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, Serology Labs and start up Famous Case Project

Serology/Blood Lab Hyper doc all labs listed in this document

Serology Data Table Hyper Doc

Serology Lab Videos-Procedures

Serology Notes

Formative Assessment checks throughout on note taking and project

Famous Case Project

Weekly Podcast

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion

To use the blood testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Generation Skills used 1,2,3,4,5,6,7,8

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test multiple choice section and a hands on section for each

Serology Labs and lab write ups

STANDARDS

Unit 2: Unit 2 Blood Analysis (5 lessons) and DNA Analysis (15 lessons)

Science - Forensics and Law - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Serology (5 lessons)

DNA-(15 lessons)

For reference the New Generation Science Practices

1. Ask Scientific ?
2. Dev and use Models as a predictive tool
3. Plan and carry out scientific investigation
4. Analyze and interpret data
5. Use math and computational thinking
6. Construct explanations
7. Create an argument based on scientifically gathered evidence
8. Obtain, evaluate and communicate information

STANDARDS

Ohio - High School - Biology	
	B.H.2
Structure and function of DNA in cells	
	B.H.1
Cellular genetics	

Unit 2: Unit 2 Blood Analysis (5 lessons) and DNA Analysis (15 lessons)

Science - Forensics and Law - Last Updated on June 30, 2023

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Serology Finish portion needed

Notes, Serology Labs and start up Famous Case Project

Serology/Blood Lab Hyper doc all labs listed in this document

Serology Data Table Hyper Doc

Serology Lab Videos-Procedures

Serology Notes

Formative Assessment checks throughout on note taking and project

Famous Case Project

Weekly Podcast

DNA -

Notes and formative assessments checks of notes

DNA video and Video Check

DNA Crash course

DNA Hyperdoc with lab procedures and data tables

Labs: How DNA works, PCR testing, RFLP testing, How DNA used to find a criminal, DNA matching, Bloody Cloth

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Blood Analysis

To use the blood testing data collected in the various labs and come up with conclusions for that data

DNA

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion with next steps

To use the DNA testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Generation Skills used 1,2,3,4,5,7,8

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

DNA and Serology

Unit Test multiple choice and hands on portion

Labs and lab write ups

STANDARDS

Unit 3: Unit 3: Glass (10 lessons) Start of Animal and Human Hairs (10 lessons)

Science - Forensics and Law - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Using the New Generation Science Practices as a guide, the topic of Glass Analysis used at a crime scene and begin hair analysis

Glass 10 lessons

Hair- Animal vs Human Hair and Locard's Principle 20 lessons (10 here)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Continue the Famous Case Project

Glass- Notes using Pear Deck with built in formative assessments checks

Glass Hyper Doc containing Instructional Videos, data tables and lab in GC

Activities:

Properties of Glass Video

Glass as Evidence WS

Labs: Properties of Glass (Density refractive index, clarity. Images of Glass, Glass Fractionation Lab,

Hair

Hair- Notes with built in formative assessments checks in GC

Hair Hyper Doc containing Instructional Videos, data tables and lab in GCs

Activities:

Human vs Animal Hair worksheets and information

Microscope Lab review

Unit 3: Unit 3: Glass (10 lessons) Start of Animal and Human Hairs (10 lessons)

Science - Forensics and Law - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion

To use the Glass testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Generation Skills used 1,2,3,4,5,6,7,8

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion

To use the Hair testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Generation Skills used 1,2,3,4,5,6,7,8

Unit 3: Unit 3: Glass (10 lessons) Start of Animal and Human Hairs (10 lessons)

Science - Forensics and Law - Last Updated on June 30, 2023

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Glass/ Hair

Unit Test with multiple choice and hands on portion
Labs and lab write ups

STANDARDS

Unit 4: Unit 4 Human Hair P 2 (10 lessons) Locard's Principle (5 lessons) Start Fiber Analysis (5 lessons)

Science - Forensics and Law - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Hair- Animal vs Human Hair and Locard's Principle

Using the New Generation Science Practices as a guide, the topic of Hair Analysis used at a crime scene and the how Locard's Principle applies

Fibers-

Using the New Generation Science Practices as a guide, the topic of Fiber Analysis used at a crime scene

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Hair- Notes with built in formative assessments checks in GC

Hair Hyper Doc containing Instructional Videos, data tables and lab in GCs

Activities

Human vs Animal Hair worksheets and information

Microscope Lab review

Labs: Locard's Principle, Human vs Animal Hair ID labs, Unknown hair lab, General Hair Labs

Fiber notes and formative assessments checks in GC

FiberHyper Doc containing Instructional Videos, data tables and lab in GCs

Fiber Analysis worksheets and information

Labs: Fiber Id lab, Unknown fiber LAB

Unit 4: Unit 4 Human Hair P 2 (10 lessons) Locard's Principle (5 lessons) Start Fiber Analysis (5 lessons)

Science - Forensics and Law - Last Updated on June 30, 2023

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion

To use the Hair testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Generation Skills used 1,2,3,4,5,6,7,8

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion

To use the Fiber testing data collected in the various labs and come up with conclusions for that data

Take a crime scene scenarios and use the skills needed to solve the scenario

Presentation

Generation Skills used 1,2,3,4,5,,7,8

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Hair

Unit Test multiple choice and hands on Portion

Labs and lab write ups

Fibers

Unit Test multiple choice and hands on Portion

Labs and lab write ups

STANDARDS

Unit 5: Unit 4.5 (10 lessons) Famous Case Project and Final Crime Scene

Science - Forensics and Law - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Fibers and Wrap up Famous Case Project and presentations

Hands on Final Crime Scene

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Project_ Presentation, Poster and Paper

Combining all skills in about 4 units

Hand on Crime Scene Final. Use all knowledge collected in Semester to Solve the Crime Scene that is set up

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Be able use the Scientific Method to collect data, organize data in a scientific format, analyze data, write a clear and concise conclusion

Take a crime scene scenarios and use the skills needed to solve the scenario

Presentation

Generation Skills used 1,2,3,4,5,,7,8

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Project_ Presentation, Poster and Paper

Hand on Crime Scene Final. Use all knowledge collected in Semester to Solve the Crime Scene that is set up

STANDARDS

Science - Honors Chemistry

Vermilion Local School District

UNITS (9/9 SELECTED)

 Unit 1: Matter	<i>30 lessons</i>
 Unit 2: Energy and States - Part 1	<i>17 lessons</i>
 Unit 3: Energy and States - Part 2	<i>16 lessons</i>
 Unit 4: Describing Substances	<i>16 lessons</i>
 Unit 5: Counting	<i>18 lessons</i>
 Unit 6: Internal Structure	<i>20 lessons</i>
 Unit 7: Representing Chemical Changes	<i>20 lessons</i>
 Unit 8: Stoichiometry	<i>20 lessons</i>
 Unit 9: Stoichiometry - 2	<i>10 lessons</i>

Unit 1: Matter

Science - Honors Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Scientific Method & Measurements, Significant Figures, Mass, Volume, Density, Graphing

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Mass and Change Lab, Comparing Volume Units Lab, Mass and Volume Lab, Density of a Gas Lab, Thickness of Aluminum Foil Lab, notes, small group discussion, whole class discussion, white board meetings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Know the steps of the scientific method & be able to properly estimates measurements, use and distinguish significant figures, define mass and volume and density, be able to graph mass versus volume, draw particle models depicting a substances mass and volume

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Quizzes, Unit 1 Test

STANDARDS

Ohio Extended - Grades 9-12 - Chemistry
CHM.912.1c
Identify that all matter is made of atoms.
Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).

Unit 1: Matter

Science - Honors Chemistry - Last Updated on June 30, 2023

NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b

Unit 1: Matter

Science - Honors Chemistry - Last Updated on June 30, 2023

Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
Science is a Human Endeavor
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.

Unit 1: Matter

Science - Honors Chemistry - Last Updated on June 30, 2023

NS.4.4

Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Unit 2: Energy and States - Part 1

Science - Honors Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Kinetic energy, gas laws, pressure, volume, temperature, solving for a variable

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, small group discussion, whole class discussion, white board meetings, videos, diffusion of gases, how a thermometer works demonstration, gas laws labs. bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define kinetic energy, pressure, volume, temperature. Be able to mathematically use the gas laws equations to predict changes in a system. Draw particle models demonstrating substances

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Quizzes

Lab Report, Unit 2 Test

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6

Unit 2: Energy and States - Part 1

Science - Honors Chemistry - Last Updated on June 30, 2023

Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.

Unit 2: Energy and States - Part 1

Science - Honors Chemistry - Last Updated on June 30, 2023

NS.2.4
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NS.3.
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Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.
NS.4.5

Unit 2: Energy and States - Part 1

Science - Honors Chemistry - Last Updated on June 30, 2023

Improvements in technology allow us to gather new scientific evidence.

Ohio Extended - Grades 9-12 - Chemistry

CHM.912.1b

Identify a diagram or model of an atom.

CHM.912.1c

Identify that all matter is made of atoms.

CHM.912.6a

Identify measurements of gases (volume, temperature and pressure).

Unit 3: Energy and States - Part 2

Science - Honors Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Kinetic energy and potential energy, physical changes, solving for a variable

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, small group discussion, whole class discussion, white board meetings, videos, bellringers, Icy Hot Lab, Phase Change Lab, Melting Blocks Demonstration, Heating and Cooling Curves Lab, Soda Can Calorimetry, Heat of Fusion Lab, Specific Heat of a Metal Lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define kinetic energy and potential energy, heating and cooling curves, ability to determine the difference between what is happening at the particle level when substances go through a phase change and a temperature change

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Quizzes, Unit 3 Test

STANDARDS

Ohio - High School - Nature of Science	
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Scientific Inquiry, Practice and Applications	
NS.1.1	
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NS.1.2	
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.	
NS.1.3	
Use technology and mathematics to improve investigations and communications.	
NS.1.4	
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).	
NS.1.5	
Recognize and analyze explanations and models.	
NS.1.6	

Unit 3: Energy and States - Part 2

Science - Honors Chemistry - Last Updated on June 30, 2023

Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
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NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.

Unit 3: Energy and States - Part 2

Science - Honors Chemistry - Last Updated on June 30, 2023

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Unit 3: Energy and States - Part 2

Science - Honors Chemistry - Last Updated on June 30, 2023

Improvements in technology allow us to gather new scientific evidence.

Ohio Extended - Grades 9-12 - Chemistry

CHM.912.1b

Identify a diagram or model of an atom.

CHM.912.1c

Identify that all matter is made of atoms.

Unit 4: Describing Substances

Science - Honors Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Distinguishing pure substances from mixtures, elements and compounds, determination of chemical formulas of compounds

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Pure substances vs. mixtures discussion, Electrolysis of water, barking test tubes, notes, small group discussion, whole class discussion, white board meetings, videos,

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Distinguish between pure substance and mixtures. Use characteristic properties to separate a mixture. Distinguish elements from compounds. Cite evidence indicating compounds occur in a definite ratio. Use evidence from combining volumes to deduce formulas of some compounds.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 4 Quiz

Element Tile Project

STANDARDS

Ohio - High School - Nature of Science
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NS.1.1
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NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6

Unit 4: Describing Substances

Science - Honors Chemistry - Last Updated on June 30, 2023

Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
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Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.

Unit 4: Describing Substances

Science - Honors Chemistry - Last Updated on June 30, 2023

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The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
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NS.4.5

Unit 4: Describing Substances

Science - Honors Chemistry - Last Updated on June 30, 2023

Improvements in technology allow us to gather new scientific evidence.
Ohio Extended - Grades 9-12 - Chemistry
CHM.912.2a
Represent a chemical compound with a ball and stick model or chemical formula.
CHM.912.1b
Identify a diagram or model of an atom.
CHM.912.1c
Identify that all matter is made of atoms.
CHM.912.2c
Identify that two elements combine to form a compound.

Unit 5: Counting

Science - Honors Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

ACT Prep, Relative Mass, Molar Conversions, Percent Composition, Empirical Formula, Molecular Formula, Ionic vs. Covalent Compounds, Particles containing, protons, neutrons and electrons.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Relative mass lab, Empirical Formula Lab, Gum Lab (percent composition), Mole Scavenger Hunt, notes, small group discussion, whole class discussion, white board meetings, videos, bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define relative mass and learn how to mathematically determine the relative mass of elements on the periodic table. Be able to convert grams/atoms of a substance to moles of that substance and vice versa. Be able to calculate the percent composition of a compound. Define empirical formula and molecular formula. Calculate the empirical and molecular formula of a compound

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 5 Test
Quizzes

STANDARDS

Ohio - High School - Nature of Science	
NS.1.	
Scientific Inquiry, Practice and Applications	
NS.1.1	
Identify questions and concepts that guide scientific investigations.	
NS.1.2	
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.	
NS.1.3	
Use technology and mathematics to improve investigations and communications.	
NS.1.4	

Unit 5: Counting

Science - Honors Chemistry - Last Updated on June 30, 2023

Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
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NS.2.1.d
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NS.2.1.e
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NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.

Unit 5: Counting

Science - Honors Chemistry - Last Updated on June 30, 2023

NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
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Unit 5: Counting

Science - Honors Chemistry - Last Updated on June 30, 2023

Some science knowledge pertains to probabilities or tendencies.

NS.4.4

Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

NS.4.5

Improvements in technology allow us to gather new scientific evidence.

Ohio Extended - Grades 9-12 - Chemistry

CHM.912.1b

Identify a diagram or model of an atom.

Unit 6: Internal Structure

Science - Honors Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

ACT Prep, Ionic vs. Covalent Compounds, Particles containing, protons, neutrons and electrons. Chemical nomenclature

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Sticky Tape Lab, Conductivity of solutions and substances lab, Electrolysis of copper(II) chloride, notes, small group discussion, whole class discussion, white board meetings, videos, bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Chemical nomenclature of ionic and covalent compounds, Ionic vs. Covalent Compounds, Particles containing, protons, neutrons and electrons. Nomenclature.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 6 Test
Quizzes

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.

Unit 6: Internal Structure

Science - Honors Chemistry - Last Updated on June 30, 2023

NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
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NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3

Unit 6: Internal Structure

Science - Honors Chemistry - Last Updated on June 30, 2023

Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
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Some science knowledge pertains to probabilities or tendencies.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

Unit 6: Internal Structure

Science - Honors Chemistry - Last Updated on June 30, 2023

NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio Extended - Grades 9-12 - Chemistry
CHM.912.2a
Represent a chemical compound with a ball and stick model or chemical formula.
CHM.912.1a
Identify parts of an atom (protons, neutrons, electrons).
CHM.912.2b
Identify that a ball and stick model or chemical formula represents a chemical compound.
CHM.912.1c
Identify that all matter is made of atoms.
CHM.912.2c
Identify that two elements combine to form a compound.

Unit 7: Representing Chemical Changes

Science - Honors Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Chemical Reactions, evidence of chemical change, Law of Conservation of Mass, Reaction Types, Balance chemical equations, Endothermic and exothermic reactions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Nail Lab, Reaction Types Lab, notes, small group discussion, whole class discussion, white board meetings, videos, bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Show evidence of chemical reactions, evidence of chemical change, Law of Conservation of Mass. Be able to identify the 5 basic reaction types, Balance chemical equations, Identify reactions as either endothermic or exothermic.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 7 Test
Lab Report
Quizzes

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.

Unit 7: Representing Chemical Changes

Science - Honors Chemistry - Last Updated on June 30, 2023

NS.1.6
Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
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Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3

Unit 7: Representing Chemical Changes

Science - Honors Chemistry - Last Updated on June 30, 2023

Science arguments are strengthened by multiple lines of evidence supporting a single explanation.
NS.2.4
The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
NS.3.
Science is a Human Endeavor
NS.3.1
Science depends on curiosity, imagination, creativity and persistence.
NS.3.2
Individuals from different social, cultural, and ethnic backgrounds work as scientists and engineers.
NS.3.3
Science and engineering are influenced by technological advances and society; technological advances and society are influenced by science and engineering.
NS.3.4
Science and technology might raise ethical, social and cultural issues for which science, by itself, does not provide answers and solutions.
NS.4.
Scientific Knowledge is Open to Revision in Light of New Evidence
NS.4.1
Science can advance through critical thinking about existing evidence.
NS.4.2
Science includes the process of comparing patterns of evidence with current theory.
NS.4.3
Some science knowledge pertains to probabilities or tendencies.
NS.4.4
Science should carefully consider and evaluate anomalies (persistent outliers) in data and evidence.

Unit 7: Representing Chemical Changes

Science - Honors Chemistry - Last Updated on June 30, 2023

NS.4.5
Improvements in technology allow us to gather new scientific evidence.
Ohio Extended - Grades 9-12 - Chemistry
CHM.912.4a
Identify the reactants and the products in a chemical reaction (e.g., Ingredients/bread)
CHM.912.4b
Perform a chemical reaction (baking soda and vinegar).
CHM.912.4c
Identify common chemical reactions (e.g., cooking, burning).

Unit 8: Stoichiometry

Science - Honors Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Stoichiometry, percent yield, limiting reactant

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Copper-silver nitrate lab, Smore Stoichiometry , Conservation of mass during a chemical reaction lab, molar volume of a gas, notes, small group discussion, whole class discussion, white board meetings, videos, bellringers

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Define stoichiometry, percent yield, limiting reactant. Calculate the amount of reactants and products using stoichiometry.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit 8 Test
Quizzes
Final Exam

STANDARDS

Ohio - High School - Nature of Science
NS.1.
Scientific Inquiry, Practice and Applications
NS.1.1
Identify questions and concepts that guide scientific investigations.
NS.1.2
Design and conduct scientific investigations using a variety of methods and tools to collect empirical evidence, observing appropriate safety techniques.
NS.1.3
Use technology and mathematics to improve investigations and communications.
NS.1.4
Formulate and revise explanations and models using logic and scientific evidence (critical thinking).
NS.1.5
Recognize and analyze explanations and models.
NS.1.6

Unit 8: Stoichiometry

Science - Honors Chemistry - Last Updated on June 30, 2023

Communicate and support scientific arguments.
NS.2.
Science is a Way of Knowing
NS.2.1
Various science disciplines use diverse methods to obtain evidence and do not always use the same set of procedures to obtain and analyze data (i.e., there is no one scientific method).
NS.2.1.a
Make observations and look for patterns.
NS.2.1.b
Determine relevant independent variables affecting observed patterns.
NS.2.1.c
Manipulate an independent variable to affect a dependent variable.
NS.2.1.d
Conduct an experiment with controlled variables based on a question or hypothesis.
NS.2.1.e
Analyze data graphically and mathematically.
NS.2.2
Science disciplines share common rules of evidence used to evaluate explanations about natural phenomenon by using empirical standards, logical arguments and peer reviews.
NS.2.2.a
Empirical standards include objectivity, reproducibility, and honest and ethical reporting of findings.
NS.2.2.b
Logical arguments should be evaluated with open-mindedness, objectivity and skepticism.
NS.2.3
Science arguments are strengthened by multiple lines of evidence supporting a single explanation.

Unit 8: Stoichiometry

Science - Honors Chemistry - Last Updated on June 30, 2023

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The various scientific disciplines have practices, methods, and modes of thinking that are used in the process of developing new science knowledge and critiquing existing knowledge.
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Science is a Human Endeavor
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Unit 8: Stoichiometry

Science - Honors Chemistry - Last Updated on June 30, 2023

Improvements in technology allow us to gather new scientific evidence.

Ohio Extended - Grades 9-12 - Chemistry

CHM.912.4a

Identify the reactants and the products in a chemical reaction (e.g., Ingredients/bread)

CHM.912.4b

Perform a chemical reaction (baking soda and vinegar).

CHM.912.4c

Identify common chemical reactions (e.g., cooking, burning).

Unit 9: Stoichiometry - 2

Science - Honors Chemistry - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Stoichiometry of gases, partial pressures of gases, and molar volume of a gas

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

molar volume of a gas, notes, small group discussion, whole class discussion, white board meetings, videos, bellringers. Molar Volume of a gas lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Calculate the amount of reactants and products using stoichiometry.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

STANDARDS

Science - HS - Physics

Vermilion Local School District

UNITS (9/9 SELECTED)		SUGGESTED DURATION
 Unit 1: Kinematics		20 lessons
 Unit 2: Dynamics		20 lessons
 Unit 3: Circular Motion and Gravity		20 lessons
 Unit 4: Energy		20 lessons
 Unit 5: Momentum		20 lessons
 Unit 6: Simple Harmonic Motion		20 lessons
 Unit 7: Torque and Rotation		20 lessons
 Unit 8: Electricity		20 lessons
 Unit 9: Waves		20 lessons

Unit 1: Kinematics

Science - HS - Physics - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Kinematics

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Position, velocity, and acceleration
- Representations of motion

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit tests where SWBAT solve speed, velocity, and acceleration problems

SWBAT connect, modify and design graphs for a variety of motions

Vocabulary quizzes

Water Rockets

Labs, homework (book work and worksheets), research and discussion,

STANDARDS

Ohio - High School - Physics	
	P.M
MOTION	
	P.M.1.a
Motion Graphs: Position vs. time	
	P.M.1.b
Motion Graphs: Velocity vs. time	
	P.M.1.c
Motion Graphs: Acceleration vs. time	
	P.M.2.a
Problem Solving: Using graphs (average velocity, instantaneous velocity, acceleration, displacement, change in velocity)	
	P.M.2.b
Problem Solving: Uniform acceleration including free fall (initial velocity, final velocity, time, displacement,	

Unit 1: Kinematics

Science - HS - Physics - Last Updated on June 30, 2023

acceleration, average velocity)
P.M.3.a
Projectile Motion: Independence of horizontal and vertical motion
P.M.3.b
Projectile Motion: Problem-solving involving horizontally launched projectiles

Unit 2: Dynamics

Science - HS - Physics - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Dynamics

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Systems
 - The gravitational field
 - Contact forces
 - Newton's First Law
 - Newton's Third Law and free-body diagrams
 - Newton's Second Law
-
- Applications of Newton's Second Law

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit tests where SWBAT develop free body diagrams for a variety of motion situations.

Vocabulary quizzes

Lunar Rover activity

STANDARDS

Ohio - High School - Physics	
	P.F
FORCES, MOMENTUM AND MOTION	
	P.F.1
Newton's laws applied to complex problems	
	P.F.4
Friction force (static and kinetic)	
	P.F.5
Air resistance and drag	
	P.F.6.a
Forces in two dimensions: Adding vector forces	
	P.F.6.b

Unit 2: Dynamics

Science - HS - Physics - *Last Updated on June 30, 2023*

Forces in two dimensions: Motion down inclines

Unit 3: Circular Motion and Gravity

Science - HS - Physics - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Circular Motion and Gravity

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Vector fields
- Fundamental forces
- Gravitational and electric forces
- Gravitational field/acceleration due to gravity on different planets
- Inertial vs. gravitational mass

- Centripetal acceleration vs. centripetal force

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit tests where SWBAT sketch and illustrate free body diagrams for circular motion.

SWBAT calculate the force of gravity and compare the gravitational fields for multiple systems.

Vocabulary quizzes

Flying pigs

STANDARDS

Ohio - High School - Physics	
	P.F.2
Gravitational force and fields	
	P.F.5
Air resistance and drag	
	P.E.1
Gravitational potential energy	
	P.E.2
Energy in springs	
	P.E.4
Conservation of energy	

Unit 4: Energy

Science - HS - Physics - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Energy

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Open and closed systems: Energy
- Work and mechanical energy
- Conservation of energy, the work–energy principle, and power

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit tests where SWBAT demonstrate the law of conservation of energy through calculations, illustrations, and compare and contrast scenarios.

Vocabulary quizzes

Rube Goldberg

STANDARDS

Ohio - High School - Physics	
	P.E
ENERGY	
	P.E.1
Gravitational potential energy	
	P.E.2
Energy in springs	
	P.E.3
Work and power	
	P.E.4
Conservation of energy	
	P.E.5
Nuclear energy	

Unit 5: Momentum

Science - HS - Physics - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Momentum and conservation of momentum

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Momentum and impulse
- Representations of changes in momentum
- Open and closed systems: momentum
- Conservation of linear momentum

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Egg drop

SWBAT make predictions about the result of collision given elastic and inelastic scenarios.

SWBAT discuss technologies roll in safety during collisions.

Vocabulary quizzes

STANDARDS

Ohio - High School - Physics	
	P.F.7
Momentum, impulse and conservation of momentum	
	P.E
ENERGY	
	P.E.4
Conservation of energy	

Unit 6: Simple Harmonic Motion

Science - HS - Physics - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Simple Harmonic Motion, Springs, and Pendulums

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Period of simple harmonic oscillators
- Energy of a simple harmonic oscillator

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

SWBAT Make predictions and test percent error for the period of springs and pendulums.

Vocabulary quizzes

Pendulums

STANDARDS

Ohio - High School - Physics	
	P.E.4
Conservation of energy	
	P.W
WAVES	
	P.W.1.a
Wave properties: Conservation of energy	
	P.E.2
Energy in springs	
	P.E.1
Gravitational potential energy	

Unit 7: Torque and Rotation

Science - HS - Physics - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Torque, Rotation, and simple machines

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Rotational kinematics
- Torque and angular acceleration
- Angular momentum and torque
- Conservation of angular momentum

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit tests

Vocabulary quizzes

Levers and mobiles

STANDARDS

Ohio - High School - Physics	
	P.E.3
Work and power	
	P.E.2
Energy in springs	
	P.F.6.c
Forces in two dimensions: Centripetal forces and circular motion	

Unit 8: Electricity

Science - HS - Physics - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Circuits and Electricity

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Conservation of charge
- Electric charge
- Electric force

- DC Circuits

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit tests

Vocabulary quizzes

STANDARDS

Ohio - High School - Physics	
	P.EM
ELECTRICITY AND MAGNETISM	
	P.EM.2
Coulomb's law	
	P.EM.3
Electric fields and electric potential energy	
	P.EM.4.a
DC circuits: Ohm's law	
	P.EM.4.b
DC circuits: Series circuits	
	P.EM.4.c
DC circuits: Parallel circuits	
	P.EM.4.d

Unit 8: Electricity

Science - HS - Physics - Last Updated on June 30, 2023

DC circuits: Mixed circuits

P.EM.4.e

DC circuits: Applying conservation of charge and energy (junction and loop rules)

Unit 9: Waves

Science - HS - Physics - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Sound and light waves

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, lab simulations, computer simulations, small group and whole group discussion, readings

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Properties of waves
- Periodic waves
- Interference and superposition (waves in tubes and on strings)

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit tests

Vocabulary quizzes

Musical instruments

STANDARDS

Ohio - High School - Physics	
	P.W
WAVES	
	P.W.1.a
Wave properties: Conservation of energy	
	P.W.1.b
Wave properties: Reflection	
	P.W.1.c
Wave properties: Refraction	
	P.W.1.d
Wave properties: Interference	
	P.W.1.e
Wave properties: Diffraction	
	P.W.2.a

Unit 9: Waves

Science - HS - Physics - Last Updated on June 30, 2023

Light phenomena: Ray diagrams (propagation of light)
P.W.2.b
Light phenomena: Law of reflection (equal angles)
P.W.2.c
Light phenomena: Snell's law
P.W.2.d
Light phenomena: Diffraction patterns
P.W.2.e
Light phenomena: Wave—particle duality of light
P.W.2.f
Light phenomena: Visible spectrum of color

Science - HS - Physiology

Vermilion Local School District

UNITS (5/5 SELECTED)

-  Unit 1: Unit 1: Chemistry of Life and Cells/ATP Production
-  Unit 1: Unit 2: Muscles
-  Unit 3: Unit 3: Respiratory System (20 lessons)
-  Unit 4: Unit 4 Nervous System (20 lessons)
-  Unit 6: Unit 4.5: Cardiac System and Final

SUGGESTED DURATION

20 lessons

20 lessons

20 lessons

20 lessons

10 lessons

Unit 1: Unit 1: Chemistry of Life and Cells/ATP Production

Science - HS - Physiology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

The overarching content to be covered in course is the function of the Different Body Systems at a cellular level and how the different systems interact..

Chemistry of Life- (10 lessons)

The elements and molecules that make up living things. How these chemicals interact

Cells and ATP production. (10 lessons)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes on Chemistry of Life, information sheets on the different elements and molecules. .
Lewis Dot interactive, AP packet on Chem of Life

Labs; Osmosis Lab, Molecular Structure lab, PH lab

Cells and ATP notes broken up as we learn the different sections

AP packet on Cells and ATP

Labs: ATP Story Book Project-Rubric in GC

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

To be able to recognize the chemical makeup of the compounds of living organisms

To be able to explain the functions of the essential molecules within living things.

Develop an understanding of how certain elements and molecules affect living organisms and ultimately cells function and create ATP

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test on Chemistry of Life

Unit Test on Cells and ATP and the story book which can be used on the test

STANDARDS

Unit 1: Unit 2: Muscles

Science - HS - Physiology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Muscles: (20 lessons)

The cellular anatomy and cellular functions of the Muscle System and how it relates to the other systems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes on Muscular System

Activities

3 crash course videos and worksheets that go with, AP Muscle Packet

Fiber differences worksheet

Lab: Steps in muscle contraction interactive, Muscle Dissection

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

To be able to explain and recognize the processes of the Muscular system and the the organs associated with it

Develop an understanding of how the System interacts with all the other systems at a functional level

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written assessment of the processes etc of the Muscle System with short answer and hands on portion

STANDARDS

Ohio - High School - Human Anatomy and Physiology	
	AP.LO
LEVELS OF ORGANIZATION	
	AP.LO.2
Types of Tissues	
	AP.LO.3
Homeostasis	
	AP.LO.4
Anatomical Terminology	
	AP.SM
SUPPORT AND MOTION	

Unit 3: Unit 3: Respiratory System (20 lessons)

Science - HS - Physiology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

The gross processes of the Respiratory System as well as how it relates to the other systems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes on Respiratory System

Labs: Lung Capacity lab and beyond our Classroom, lung dissection

Ap Respiratory Packet and Diseases of Respiratory System

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

To be able to explain and recognize the processes of the functions of the system at a cellular level

Develop an understanding of how the System interacts with all the other systems at a functional level

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written Unit Test with short answer

Labs

STANDARDS

Unit 4: Unit 4 Nervous System (20 lessons)

Science - HS - Physiology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Nervous System 20 lessons

The gross processes of the Nervous System and its general electrical component of the system as well as how it relates to the other systems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes on Nervous System

Labs: Brain Dissection, Eye Dissection, The sensory lab, Neuro science action interactive lab

Activities: AP Nerve Packet, 3 crash course videos with associated questions

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

To be able to explain and recognize the processes of the functions of the system at a cellular level

Develop an understanding of how the System interacts with all the other systems at a functional level

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written assessment of the Nervous System and short answer
Brain Dissection and Eye Dissection

STANDARDS

Unit 6: Unit 4.5: Cardiac System and Final

Science - HS - Physiology - Last Updated on June 30, 2023

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

The gross processes of the Cardiac System and its general electrical component of the system as well as how it relates to the other systems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes on Heart and cardiac System

AP Cardiac Packet

Lab: Heart Dissection, Blood pressure readings and the effect of activity on blood pressure. 6 part cardiac lab

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

To be able to explain and recognize the processes of the functions of the system at a cellular level

Develop an understanding of how the System interacts with all the other systems at a functional level

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Written assessment of the processes of the Cardiac System

Heart Dissection
Comprehensive Final

STANDARDS

Ohio - High School - Human Anatomy and Physiology	
	AP.LO
LEVELS OF ORGANIZATION	
	AP.LO.1
Hierarchy of Organization	
	AP.LO.2
Types of Tissues	
	AP.LO.3
Homeostasis	
	AP.LO.4
Anatomical Terminology	

Unit 6: Unit 4.5: Cardiac System and Final

Science - HS - Physiology - Last Updated on June 30, 2023

AP.SM
SUPPORT AND MOTION
AP.T.2
Cardiovascular System