Course Title: Earth Science 8

Topic/Concept: Nature of Science

Time Allotment: 3 weeks

Unit Sequence: 1

Major Concepts to be learned:

1. The 4 major areas of earth science and what they entail.
2. What technology is and it's benefits and drawbacks.
3. Problem solving
4. Measurements

Expected Skills to be demonstrated:

1. Be able to catagorize topics into the 4 basic areas of earthe science.
2. Give examples of technology and discuss the advantages and diadvantages.
3. Use the scientific method to systematically solve a problem.
4. Use appropriate tools to make acurate measurements with correct units.

PA Standards/Anchors:	Eligible Content:
S.8.A.1.1 S.8.A.2.1 S.8.A.2.2 S.8.A.1.2	• S.8.A.1.1.1,2,3,4 • S.8.A.2.1.1,2,3,4,5 • S.8.A.2.2.1,2,3 • S.8.A.1.2.1,2

Instructional Strategies:	Assessments:
Cooperative groupsLecture Performance task Written work Hands-on activity	• Lab work • Quizzes • Test

Course Title: Earth Science 8

Topic/Concept: Matter and It's Changes

Time Allotment: 3 weeks

Unit Sequence: 2

Major Concepts to be learned:

1. Given an element draw a model of an atom showing it's protons,neutrons,and electrons in their energy levels.
2. Describe how elements are placed on a periodic table using repeating characteristics.
3. Given an element describe it's characteristics based on it's position on the periodic table.
4. For a chemical reaction write the correct formulas and show a balanced equation.

Expected Skills to be demonstrated:

1. Use a Periodic Table to identify charcteristics of elements.
2. Make correct formulas for componds and name.
3. Make models for given elements.
4. Write balanced chemical equations.

PA Standards/Anchors:	Eligible Content:
S.8.C.1.1 S.8.A.3.2 S.8.A.3.3	• S.8.1.1.1,2,3 • S.A.3.2.1 • S.8.A.3.3.1,2

Instructional Strategies:	Assessments:
Lecture Group discussion Written work Hands-on activity Note Taking	• Lab work • Quizzes • Test

Course Title: Earth Science 8 **Topic/Concept: Minerals**

Time Allotment: 2 weeks **Unit Sequence: 3**

Major Concepts to be learned:

1. The difference between minerals and rocks.
2. Characteristics used to identify minerals.
3. Physical and chemical properties of minerals.

Expected Skills to be demonstrated:

1. Describe and identify minerals based on their physical properties.
2. Explain the difference between rocks and minerals based on how they were formed.
3. Use correct tools to determine the physical properties of minerals.

PA Standards/Anchors:	Eligible Content:
S8.A.2.1 S8.A.2.2 S8.A.3.3 S8.C.1.1	• S8.A.2.1.2,4,5 • S8.A.2.2.1,2 • S8. A.3.3.1,2 • S8.C.1.1.1.2

Instructional Strategies:	Assessments:
Cooperative groups Performance task Written work Hands-on activity Note Taking	• Lab work • Quizzes • Test

Course Title: Earth Science 8 **Topic/Concept: Rocks**

Time Allotment: 2 weeks **Unit Sequence: 4**

Major Concepts to be learned:

1. Geological processes that form rock.
2. 3 Classifications of rock.
3. Forces in nature that change rock types
4. Identification of rocks.

Expected Skills to be demonstrated:

1. Discuss processes that form and/or change rock including volcanic activity, earth quakes and erosion.
2. Determine the type of rock that will be formed based on changes that occur.
3. Identify rocks as Igneous, Metamorphic or Sedimentary.
4. Discuss characteristics each classification fo rock have, and how they are used to identify the rock type.

PA Standards/Anchors:	Eligible Content:
S8.A.3.1 S8.A.3.2 S8.A.3.3 S8.C.1.1 S8.D.1.1	• S8.A.3.1.4,5 • S8.A.3.2.3 • S8.A.3.3.2 • S8.C.1.1.1,2 • S8.D.1.1.1,2,3,4

Instructional Strategies:	Assessments:
Cooperative groups Group discussion Written work Hands-on activity Note Taking	• Lab work • Quizzes • Test

Course Title: Earth Science 8

Topic/Concept: Lanforms and Mapping

Time Allotment: 3 weeks

Unit Sequence: 5

Major Concepts to be learned:

1. Relationship between the 3 major landforms(plains, plateaus,mountains).
2. Mountain building forces.
3. Map projections.
4. Reading various types of maps.
5. Using topographic maps.

Expected Skills to be demonstrated:

1. Explain the relationship between mountains, plains,and plateaus.
2. Describe the forces that are responsible for building different types of mountains, and how the forces are created.
3. Explain how maps are made, and discuss problems associated with making projections.
4. Use a map to determine exact locations in latitude and longitude.
5. Explain what topographic maps are used for, and construct a topographic map.

PA Standards/Anchors:

S8.A.1.3
S8.A.2.1
S8.A.2.2
S8.A.3.1
S8.A.3.2
S8.D.1.1
S8.D.1.3

Eligible Content:

- S8.A.1.3.1
- S8.A.2.1.1
- S8.A.2.2.2
- S8.A.3.1.1
- S8.A.3.2.1,2
- S8.D.1.1.2
- S8.D.1.3.3

Instructional Strategies:

Problem solving activities
Lecture
Group discussion
Performance task
Written work
Hands-on activity
Note Taking

Assessments:

- Homework
- Quizzes
- Lab
- Test

Course Title: Earth Science 8 **Topic/Concept: Plate tectonics**

Time Allotment: 2 weeks **Unit Sequence: 6**

Major Concepts to be learned:

1. Evidence of Continental Drift.
2. Theory of Plate Tectonics, and causes.
3. Different plate boundaries, and the structures formed at each.

Expected Skills to be demonstrated:

1. Use evidence to back up the Theory of Continental Drift.
2. Explain how the forces are created under the earth that cause plates to move(convection currents)
3. Be able to identify boundaries created at plates, and predict stures that would be formed at each boundary.

PA Standards/Anchors:	Eligible Content:
S8.A.1.1 S8.A.3.2 S8.D.1.1 S8.C.2.1	• S8.A.1.1.1, 4 • S8.A.3.2.1, 3 • S8.D.1.1.1,2 • S8.C.2.1.2

Instructional Strategies:	Assessments:
Problem solving activities Lecture Group discussion Written work Note Taking	• Homework • Quizzes • Test • Lab

Course Title: Earth Science 8

Topic/Concept: Earthquakes and Volcanoes

Time Allotment: 3 weeks

Unit Sequence: 7

Major Concepts to be learned:

1. Realtionship between plate boundaries and eathquakes and volcanoes.
2. Internal forces that cause earthquakes and types of faults.
3. Different types of volcanoes and how they are formed.
4. Calculating epicenters of earthquakes based on wave speed and time.
5. Igneous rock features formed by volcanoes

Expected Skills to be demonstrated:

1. Explain why earthquakes and volcanoes occur more often in certain areas.
2. Predict where they are most likely to occur.
3. Determine the epicenter of an earthquake given information from 3 seismograph stations.
4. Describe the types of internal forces that cause earthquake and the type of fault each would produce.
5. Diagram and label the igneous rock features created at volcanoes.
6. Describe the types of volcanoes that occur and explain how they are caused.

PA Standards/Anchors:

S8.A.1.1
S8.A.2.1
S8.A.2.2
S8.A.3.2
S8D.1.1

Eligible Content:

- S8.A.1.1.1,2
- S8.A.2.1.1
- S8.A.2.2.1,2,3
- S8.A.3.2.1,2,3
- S8.D.1.1.1,2

Instructional Strategies:

Problem solving activities
Group discussion
Written work
Charting
Lecture
Research
Note Taking

Assessments:

- Homework
- Tests
- Quizzes
- Lab

Course Title: Earth Science 8

Topic/Concept: Atmosphere

Time Allotment: 2 weeks

Unit Sequence: 8

Major Concepts to be learned:

1. The layers that make up Earth's atmosphere.
2. Temp and pressure changes within the atmosphere and how they are caused.
3. The 3 methods of heat transfer.
4. Major wind patterns on the Earth.
5. The water cycle.

Expected Skills to be demonstrated:

1. Diagram the layers of earth's atmosphere and describe charcteristics of each layer.
2. Explain why air creates pressure and describe pressure changes within each layer.
3. Describe how temperature changes throughout atmosphere.
4. Give example of the 3 types of heat transfer, and how each is involved in warming the earth.
5. Describe wind in terms of a convection current.
6. Describe the major wind systems on earth and their cause.
7. Diagram and describe the water cycle.

PA Standards/Anchors:

S8.A.1.3
S8.3.2
S8.C.2.2
S8.D.2.1
S8.3.1
S8.C.2.1
S8.D.1.3

Eligible Content:

- S8.A.1.3.3
- S8.A.3.2.2
- S8.C.2.2.1
- S8.D.2.1.2,3
- S8.A.3.1.1,4
- S8.C.2.1.2
- S8.1.3.1

Instructional Strategies:

Problem solving activities
Lecture
Group discussion
Written work
Note Taking

Assessments:

- Tests
- Quizzes
- Homework
- Lab

Course Title: Earth Science 8

Topic/Concept: Weather and Climate

Time Allotment: 3 weeks

Unit Sequence: 9

Major Concepts to be learned:

1. Measurable factors of weather.
2. Forecasting weather.
3. Severe weather conditions
4. Cloud types
5. Factors that determine climate.

Expected Skills to be demonstrated:

1. Describe different charcteristics that determine the daily weather.
2. Use the approiate tools to measure the different characteristics of weather(including thermometer, barometer, psychrometer)
3. Look at station models and forecast the weather for certain areas.
4. Explain how fronts, air masses,and pressure systems determain weather conditions.
5. Describe and recognize the basic cloud types.
6. Explain how climate is different than weather and describe factors that determine an areas climate.

PA Standards/Anchors:

S8.1.3
S8.A.2.2
S8.C.2.2
S8.2.1
S8.A2.1
S8.A.3.2
S8.D.1.3

Eligible Content:

- S8.A.1.3.3
- S8.A.2.2.2,3
- S8.C.2.2.1
- S8.D.2.1.1,2,3
- S8.A.2.1.1
- S8.A.3.2.3
- S8.D.1.3.1

Instructional Strategies:

Problem solving activities
Group discussion
Performance task
Written work
Hands-on activity
Note Taking

Assessments:

- Tests
- Quizzes
- Homework
- Lab

Course Title: Earth Science 8 **Topic/Concept: Work and Machines**

Time Allotment: 3 weeks **Unit Sequence: 10**

Major Concepts to be learned:

1. Explain how machines make work easier.
2. List simple machines and explain how to find their mechanical advantage.
3. Decribe the different forces involved when using machines.
4. Explain how the work remains the same when using a machine.

Expected Skills to be demonstrated:

1. Explain the purpose of using simple machine.
2. List 6 simple machine and everyday example of each.
3. Calculate mechanical advantages of various machines.
4. Calculate the effort forces needed to use vrious machines.
5. Show by calculation that work done using machines is equal to the work done not using a machine.

PA Standards/Anchors:	Eligible Content:
S8.C.2.1 S8.C.3.1 S8.A.2.2	• S8.C.2.1.1,3 • S8.C.3.1.1,2,3 • S8.A.2.2.1,2,3

Instructional Strategies:	Assessments:
Problem solving activities Lecture Group discussion Written work Note Taking	• Test • Quiz • Homework • Lab

Course Title: Earth Science 8 **Topic/Concept:** Energy

Time Allotment: 2 weeks **Unit Sequence:** 11

Major Concepts to be learned:

1. Differentiate between the 6 forms of energy.
2. Classify energy sources as renewable or nonrenewable.
3. Classify 6 energy sources as forms of potential and/or kinetic.
4. Use the law of consevation of energy to describe how each type of energy can be changed to another

Expected Skills to be demonstrated:

1. Differentiate between renewable and nonrenewable energy sources.
2. Classify energy sources as renewable and nonrenewable.
3. Describe the 6 basic forms of energy and classify as potential and/or kinetic.
4. Explain the difference between potential and kinetic energy, and give example of each.
5. List the variables involved in determing an objects potential and kinetic energy.
6. Use the law of conservation of energy to explain and give examples of how one form of energy is changed to another.
7. Give examples of alternative energy sources and explain the pros and cons for each

PA Standards/Anchors:	Eligible Content:
S8.C.2.1 S8.C.2.2 S8.C.3.1 S8.D.1.2	• S8.C.2.1.1,2,3 • S8.C.2.2.1,2,3 • S8.C.3.1.1,2 • S8.D.1.2.2

Instructional Strategies:	Assessments:
Problem solving activities Lecture Group discussion Written work Hands-on activity Note Taking	• Test • Quiz • Homework • Lab

Course Title: Earth Science 8

Topic/Concept: Earth-Moon Relationbship

Time Allotment: 3 weeks

Unit Sequence: 12

Major Concepts to be learned:

1. Types of motion exhibited by the earth and moon.
2. Effects of motions caused by the earth and moon.
3. Relationship between earth's postion in space and the seasons.(north and south hemispheres)
4. Relationship between allignment between earth, moon, and sun and effects on moon phases, tides and eclipses.

Expected Skills to be demonstrated:

1. Explain the difference between rotation and revolution, and the effect each has on the earth.
2. Explain how revolution cause seasons to change and why seasons are different depending on latitude.
3. Explain how the gravity exhibited by objects cause them to revolve.
4. Diagram the seasons based on the earths postion and axis tilt.
5. Diagram the moon phases based on the positions of the earth, sun, and moon.
6. Explain how gravity cause tides to occur.
7. Explain how a lunar and solar eclipse occur, and why they don't happen each month.

PA Standards/Anchors:

S8.A.1.1	S8.A.2.1
S8.A.3.2	S8.A.3.3
S8.C.3.1	S8.D.3.1

Eligible Content:

- S8.A.1.1.4
- S8.A.3.2.1
- S8.C.3.1.1
- S8.A.2.1.1,2
- S8.A.3.3.2
- S8.D.3.1.1,2,3

Instructional Strategies:

Problem solving activities
Lecture
Research
Written work
Hands-on activity
Note Taking
Graphic organizers

Assessments:

- Tests
- Quizzes
- Homework
- Lab

Course Title: Earth Science 8

Topic/Concept: solar system

Time Allotment: 2 weeks

Unit Sequence: 13

Major Concepts to be learned:

1. Theories related to formation of solar system and the bodies making up solar system.
2. Characteristics and classification of the bodies making up solar system.
3. Motion of objects in space.
4. Forces acting on objects in solar system.

Expected Skills to be demonstrated:

1. Explain theory of the formation of solar system.
2. Differentiate between celestial bodies based on their characteristics.
3. Describe the different types of motions exhibited by celestial objects.
4. Describe characteristics used to classify celestial objects.
5. Compare and contrast charactersitics of celestial objects based on scaled measurements.
6. Use ratios to design a model of solar system.

PA Standards/Anchors:	Eligible Content:
S8.A.1.1 S8.A.2.2 S8.C.3.1 S8.D.3.1	• S8.A.1.1.1 • S8.A.2.2.1,2,3 • S8.C.3.1.1 • S8.D.3.1.1,2,3

Instructional Strategies:	Assessments:
Problem solving activities Lecture Written work Hands-on activity Note Taking	• Tests • Quiz • Homework • Lab

Course Title: Earth Science 8

Topic/Concept: Stars and Galaxies

Time Allotment: 3 weeks

Unit Sequence: 14

Major Concepts to be learned:

1. Life cycle of stars
2. Determine absolute and apparent magnitude of stars.
3. Processes occurring in stars that produce energy.
4. Structure of our sun(closest star)
5. Differentiate between solar system, constellations, and galaxies.

Expected Skills to be demonstrated:

1. Describe why stars and constellations change position.
2. Explain why we see some stars all year,others at sometimes, and some we never see.Use parallax to determine distance.
3. Describe the relationship between stars, solar systems, constellations and galaxies.
4. Explain how nuclear fusion produces enrgy within stars.
5. Explain how the life cycle of a star is determined by the fuel, and explain the progression of the H-R diagram.
6. Diagram the layers the layers of the sun and describe the functions of each layer.

PA Standards/Anchors:

S8.A.1.3	S8.A.2.1
S8.A.2.2	S8.A.3.2
S8.C.1.1	S8.C.2.1
S8.C.2.2	S8.D.3.1

Eligible Content:

- S8.A.1.3.1
- S8.A.2.2.1,3
- S8.C.1.1.3
- S8.C.2.2.1
- S8.A.2.1.1,2
- S8.A.3.2.1
- S8.C.2.1.2,3
- S8.D.3.1.1,2,3

Instructional Strategies:

Cooperative groups	Problem solving activities
Lecture	Group discussion
Performance task	Written work
Hands-on activity	Note Taking
Summarizing	

Assessments:

- Test
- Quiz
- Homework
- Lab