

Grade 6 Sciences 2021-2022

Units of Study

UNIT 1:	Thermal Energy	Start: September	Duration: 9 Weeks
<ul style="list-style-type: none">● Concepts: Relationships, Energy, Models, Transfer● Subject Specific Skills: Using models to predict phenomena, constructing explanations and designing solutions, plan and carry out investigations, engaging in arguments from evidence● Learning Experiences: In this unit, students will develop and use particle models of a pure substance to explain energy transfer from light and thermal energy. Across the unit, students develop and refine models to explain how objects can change temperature both when matter moves out of a system, and when energy is transferred between objects. Students will investigate the different features of a system to explain an energy related phenomenon, then they will conduct a series of lab investigations and simulations to learn about energy transfer and particle motion. They will test and track the flow of energy of matter and energy into or out of the system.			
UNIT 2:	Weather, Climate & Water Cycling	Start: November	Duration: 7 Weeks
<ul style="list-style-type: none">● Concepts: Systems, Consequences, Interactions● Subject Specific Skills: Develop a model to describe the cycling of water through Earth's systems, collect data to to investigate changes in weather conditions, develop a model that predicts and describes changes of particles in motion● Learning Experiences: Students will start the unit with a series of weather videos from different locations at different times of the year. They will investigate weather data specific to events and the temperature profile of the atmosphere above the Earth's surface. They will conduct investigations into how sunlight affects the temperature of different surfaces and the air above them, and how this contributes to cloud formation and growth. Students will work with manipulatives, simulations, and labs to figure out how molecules in different phases change states under different conditions and they conduct investigations into why air moves the way it does as it is heated and cooled.			
UNIT 3:	Chemical Reactions & Matter Transformations	Start: February	Duration: 8 Weeks
<ul style="list-style-type: none">● Concepts: Relationships, Interaction, Evidence, Energy, Pattern● Subject Specific Skills: Develop models to describe phenomena- analyze and interpret data-construct Explanations and design solutions- engaging in argument from evidence-plan and carrying out investigations● Learning Experiences: Students start the unit with an experiment of observing and analyzing a chemical reaction. Their observations and questions about what is going on will drive their learning to dig into a series of related phenomena as students iterate and improve models depicting what happens during chemical reactions. By the end of the unit, students have a firm grasp on how to model simple molecules, know what to look for to determine if chemical reactions have occurred, and apply their knowledge to chemical reactions to show how mass is conserved when atoms are rearranged.			
UNIT 4:	Cells & Development	Start: April	Duration: 8 Weeks
<ul style="list-style-type: none">● Concepts: Systems, Evidence, Form, Function, Structure● Subject Specific Skills: Sorting between living and nonliving, classification, cells as systems, structure and function of animal and plant cells● Learning Experiences: In this unit, students will learn about the laws of the natural world that determine the classification of organisms into six kingdoms based on patterns found in their form. They will also investigate the structure of plant and animal cells and will use microscopes to observe and draw plants and animal cells, as well as to prepare an onion skin slide and a cheek cell slide. Students will then analyze how cells represent systems with parts that depend on one another. They will compare the function of each cell part to a similar component in			

different systems such as a school or a factory. Students will also investigate the factors that affect how quickly yeast causes bread to rise.

Grade 6 Sciences 2021-2022

Unit 1: Thermal Energy

Start: September 5th

Duration: 9 Weeks

LEARNING EXPERIENCES: In this unit, students will develop and use particle models of a pure substance to explain energy transfer from light and thermal energy. Across the unit, students develop and refine models to explain how objects can change temperature both when matter moves out of a system, and when energy is transferred between objects. Students will investigate the different features of a system to explain an energy related phenomenon, then they will conduct a series of lab investigations and simulations to learn about energy transfer and particle motion. They will test and track the flow of energy of matter and energy into or out of the system.

KEY CONCEPT:
Relationships

Related Concepts / Subject Specific: Energy, Models, Transfer

STATEMENT OF INQUIRY:

Scientists use models to determine relationships between energy transfer and matter.
(How can containers keep stuff from warming up or cooling down?)

INQUIRY QUESTIONS:

Factual:

What is the difference between a hot and a cold liquid?
Where does the water on the outside of the cold cup system come from?

Conceptual:

Why do particles move more in hot liquids?
How can energy be transferred from one object or system to another?
How does the motion of particles compare in a sample of matter at a given temperature?

Debatable:

Is it easier to keep something hot or cold?
Are some materials better at keeping heat in?

OBJECTIVES AND ASSESSMENT CRITERIA:

A: Knowing and Understanding

Outline scientific knowledge and apply it to solve problems set in familiar and unfamiliar situations. Interpret information to make scientifically supported judgments.

B: Inquiring and Designing

Outline a problem to be tested by a scientific investigation and outline a testable prediction for the problem using scientific reasoning. Then outline how to manipulate the variables and how data will be collected. Finally, design an investigation.

C: Processing and Evaluating

Present, transform, and interpret the collected data and outline the results using scientific reasoning. Then discuss the validity of the prediction and method used and describe improvements or extensions to the method.

D: Reflecting on the Impacts of Science

Describe the ways in which science is applied and used to address a specific problem or issue. Discuss and analyze the various implications of the science solution and its application in solving the problem. Apply scientific language effectively. Document the work and the sources of information used.

ATLs:

Communication

RESOURCES / LITERATURE OPTIONS:

- MYP Science 2 for the International Student Textbook
- MYP by Concept Sciences Textbook
- Explore Learning Gizmos
- Exploring Scientifically Year 7 and 8

SUMMATIVE ASSESSMENT TASKS:

1. Cold Cup Challenge: Thermal Energy project that encompasses elements of all four criteria

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Unit 2: Weather, Climate & Water Cycling

Start: November 7th

Duration: 7 Weeks

LEARNING EXPERIENCES: Students will start the unit with a series of weather videos from different locations at different times of the year. They will investigate weather data specific to events and the temperature profile of the atmosphere above the Earth's surface. They will conduct investigations into how sunlight affects the temperature of different surfaces and the air above them, and how this contributes to cloud formation and growth. Students will work with manipulatives, simulations, and labs to figure out how molecules in different phases change states under different conditions and they conduct investigations into why air moves the way it does as it is heated and cooled.

KEY CONCEPT: Systems

Related Concepts / Subject Specific: Consequences, Interactions, Models

STATEMENT OF INQUIRY:

Modeling interactions of weather systems allows us to make predictions

INQUIRY QUESTIONS:

Factual:

What is precipitation?
What is a cloud made of and how do they move?
How do cold and warm air masses interact?

Conceptual:

What happens to water vapor in the air if we cool the air down, and why?
Why do clouds or storms form at some times but not others?
Why don't water droplets fall from the clouds all the time?

Debatable:

Could it snow in KAUST?

OBJECTIVES AND ASSESSMENT CRITERIA:

A: Knowing and Understanding

Outline scientific knowledge and apply it to solve problems set in familiar and unfamiliar situations. Interpret information to make scientifically supported judgments.

B: Inquiring and Designing

Outline a problem and a testable prediction for the problem using scientific reasoning. Then outline how to manipulate the variables and how data will be collected. Finally, design an investigation.

C: Processing and Evaluating

Present, transform, and interpret the collected data to outline the results using scientific reasoning. Discuss the validity of the prediction and method used and describe improvements or extensions to the method.

D: Reflecting on the Impacts of Science

Describe the ways in which science is applied and used to address a specific problem or issue. Discuss and analyze the various implications of the science solution and its application in solving the problem. Apply scientific language effectively. Document the work and the sources of information used.

ATLs:

RESOURCES / LITERATURE OPTIONS:

<https://www.metlink.org/>

MYP Science 2 for the International Student Textbook

MYP by Concept Sciences Textbook

Explore Learning Gizmos

SUMMATIVE ASSESSMENT TASKS:

Weather Prediction Assessment Criteria D and A

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Unit 3: Chemical Reactions & Matter Transformations

Start: February

Duration: 8 Weeks

LEARNING EXPERIENCES: Students start the unit with an experiment of observing and analyzing a chemical reaction. Their observations and questions about what is going on will drive their learning to dig into a series of related phenomena as students iterate and improve models depicting what happens during chemical reactions. By the end of the unit, students have a firm grasp on how to model simple molecules, know what to look for to determine if chemical reactions have occurred, and apply their knowledge to chemical reactions to show how mass is conserved when atoms are rearranged.

KEY CONCEPT:
Relationships

Related Concepts / Subject Specific: Interaction, Evidence, Energy, Pattern

STATEMENT OF INQUIRY:

When substances interact, patterns can be observed that give evidence of relationships

INQUIRY QUESTIONS:

Factual:

How and why do substances interact with one another?
How do we make predictions when matter interacts?
How does the brain interpret information?

Conceptual:

How can we use models to describe the visible and invisible aspects of matter?
How can we make something that was not there before?

Debatable:

Is a glow stick like a firefly?

OBJECTIVES AND ASSESSMENT CRITERIA:

A: Knowing and Understanding

Outline scientific knowledge and apply it to solve problems set in familiar and unfamiliar situations. Interpret information to make scientifically supported judgments.

B: Inquiring and Designing

Outline a problem to be tested by a scientific investigation and outline a testable prediction for the problem using scientific reasoning. Then outline how to manipulate the variables and how data will be collected. Finally, design an investigation.

C: Processing and Evaluating

Present, transform and interpret the collected data to outline the results using scientific reasoning. Then discuss the validity of the prediction and method used and describe improvements or extensions to the method.

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Describe the ways in which science is applied and used to address a specific problem or issue. Discuss and analyze the various implications of the science solution and its application in solving the problem. Apply scientific language effectively. Document the work and the sources of information used.

ATLs:

RESOURCES / LITERATURE OPTIONS:

MYP Science 2 for the International Student Textbook

MYP by Concept Sciences Textbook

Explore Learning Gizmos

SUMMATIVE ASSESSMENT TASKS:

What is Happening to the Taj Mahal? (Lab) B and C

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Unit 4: Cells & Development

Start: January 30th

Duration: 8 Weeks

LEARNING EXPERIENCES: In this unit, students will learn about the laws of the natural world that determine the classification of organisms into six kingdoms based on patterns found in their form. They will also investigate the structure of plant and animal cells and will use microscopes to observe and draw plants and animal cells, as well as to prepare an onion skin slide and a cheek cell slide. Students will then analyze how cells represent systems with parts that depend on one another. They will compare the function of each cell part to a similar component in different systems such as a school or a factory. Students will also investigate the factors that affect how quickly yeast causes bread to rise.

KEY CONCEPT: Systems

Related Concepts / Subject Specific: Evidence, Form, Function, Structure

STATEMENT OF INQUIRY:

Scientists have classified the world around us through gathering evidence, and their recent research into the form and function of cells is leading to exciting, though controversial, developments in medicine.

INQUIRY QUESTIONS:

Factual:

What is living and nonliving?
What are the six kingdoms?
What is inside a cell?
What do cells need to survive?

Conceptual:

How do we group different organisms?
How do cells differ in form?
How does the form of a cell relate to its function?

Debatable:

Should all people who die automatically have their organs made available for transplantation?

OBJECTIVES AND ASSESSMENT CRITERIA:

A: Knowing and Understanding

Outline scientific knowledge and apply it to solve problems set in familiar and unfamiliar situations. Interpret information to make scientifically supported judgments.

B: Inquiring and Designing

Outline a problem to be tested by a scientific investigation and outline a testable prediction for the problem using scientific reasoning. Then outline how to manipulate the variables and how data will be collected. Finally, design an investigation.

C: Processing and Evaluating

Present, transform and interpret the collected data to outline the results using scientific reasoning. Then discuss the validity of the prediction and method used and describe improvements or extensions to the method.

D: Reflecting on the Impacts of Science

Describe the ways in which science is applied and used to address a specific problem or issue. Discuss and analyze the various implications of the science solution and its application in solving the problem. Apply scientific language effectively. Document the work and the sources of information used.

ATLs:

RESOURCES / LITERATURE OPTIONS:

- MYP Science 2 for the International Student Textbook
- MYP by Concept Sciences Textbook
- Explore Learning Gizmos
- Exploring Scientifically Year 7 and 8

SUMMATIVE ASSESSMENT TASKS:

1.