## Physical Science/Energy

### Grade/Course: 4

**Unit:** (Description) Physical Science/Energy

**Standards:**
- Physical Science, Chemistry, and Physics 3.4.4.C
- Inquiry and Design 3.2.4.A, 3.2.4.B, 3.2.4.C, 3.2.4.D

**Essential Content and Skills:**
The learner will
- Identify and describe different types of force and motion resulting from these forces, or the effect of the interaction between force and motion.

**Essential Questions:**
How could you demonstrate that a force can change an object’s motion (speed or direction)?

**Big Ideas:**
**Big Idea #1: Newtonian Laws of Force & Motion:** A force is required to change an object’s speed or direction
- A force is required to change an object’s speed or direction.
- Changes in speed or direction of motion are caused by forces.
- An object’s position can be described in terms of its relationships to another object or a stationary background.
- The greater the force the greater the change in motion.

**On-going Remediation:** Compass, Study Island, Reading in Science Resources, Activity Resources, Graphic Organizers, Manipulatives

**On-Going Enrichment** Internet Science Websites, Advanced Learners Activities in TE

**Vocabulary**
- force, motion, speed, direction, position, stationary

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## Electricity and Magnetism

### Grade/Course: 4

**Unit:** (Description) Electricity and Magnetism

**Standards:**
- Inquiry and Design 3.2.4.A, 3.2.4.B, 3.2.4.C, 3.2.4.D
- Physical Science, Chemistry and Physics 3.4.4.B

**Essential Content and Skills:**
The learner will
- Recognize basic energy types and sources, or describe how energy can be changed from one form to another.

**Essential Questions:**
What is the evidence that magnets and electricity produce forces?

**Big Ideas:**

**Big Idea #2: Newtonian Laws of Force & Motion: Magnets and electricity produce related forces.**
- Magnets attract or repel other magnets. (S4C.3.1.1)
- Magnets attract certain kinds of materials. (S4C.3.1.1)
- Forces can attract or repel other objects. (S4C.3.1.1)
- Electric charges flowing through a wire can produce a measurable force on magnets and other objects. (S4C.3.1.1)

**On-going Remediation:** Compass, Study Island, Reading in Science Resources, Activity Resources, Graphic Organizers, Manipulatives

**On-Going Enrichment** Internet Science Websites, Advanced Learners Activities in TE

**Vocabulary:**
- materials, attract, repel, magnets, electricity, electric charge

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**Grade/Course:** 4

**Unit: (Description)** Unit E Properties of Matter, Changes in Matter, Chapters 10-11, Lessons 1-5

**Standards:**
- Physical Science, Chemistry and Physics 3.4.4.A
- Inquiry and Design 3.2.4.A, B, C, D

**Essential Content and Skills:**
- The learner will
  - Describe observable physical properties of matter

**Essential Questions:**
How can physical properties be used to describe matter?

**Big Ideas:** 3

**Big Idea #3: Atomic Molecular Theory of Matter:** The characteristic properties of matter can be used to identify and separate one substance from another
- All objects and substances in the world are made of matter. (S4C.1.1.1)
- Materials may be composed of parts that are too small to be seen without magnification. (S4C.1.1)
- Matter has two fundamental properties that can be measured: matter has mass (related to weight) and matter takes up space (related to length, area and volume). (S4C.1.1.1)
- Matter can exist in different states. The three most common are solids, liquids, and gases. (S4C.1.1.1)
- Air is a substance that surrounds us, has mass and takes up space. (S4C.1.1.1)
- Heating and cooling (temperature change) may cause changes in the properties of materials including phase changes in the state of matter. (S4C.1.1.2)
- When a new material is made by combining two or more materials, it has properties that are different from the original
Water has unique properties which makes it an important resource. (S.4.C.1.1.1)

**On-going Remediation:** Compass, Study Island, Reading in Science Resources, Activity Resources, Graphic Organizers, Manipulatives

**On-Going Enrichment** Internet Science Websites, Advanced Learners Activities in TE

**Vocabulary**
- matter, substance, properties, mass, states of matter, temperature, phase change, resource

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**Grade/Course:** 4  
**Unit:** (Description) Life Science, Unit B, Chapter 4

**Standards:**  
- Inquiry and Design 3.2.4.A, B, C, D  
- Biological Sciences 3.3.4.A, B, C, D  
- Environment and Ecology 4.1.4 C,D,E / 4.3.4 C / 4.4.4 B / 4.5.4 A,B,C / 4.6.4 A,B, C / 4.7.4. A,B, C

**Essential Content and Skills:**
The learner will
- Identify and explain how adaptations help organisms to survive.  
- Identify that characteristics are inherited and, thus, offspring closely resemble their parents.  
- Identify and describe similarities and differences between living things and their life processes.

**Essential Questions:**  
How does the variation among individuals affect their survival?

**Big Ideas:** 4  
**Big Idea #4: Evolution of Life Over Time:** Different characteristics of plants and animals help some populations survive and reproduce in greater numbers.
- Individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing, creating a population with survival and reproductive advantages. (S4B.1.1.4; S4B.2.1.1 & 2)
- Organisms inherit characteristics from their parents. (S4B.2.2.1)
- Fossils can be compared to one another and to organisms according to their anatomical similarities and differences. (S4B.1.1.2)
- Some organisms that lived long ago are similar to existing organisms, but some are quite different. (S4B.1.1.2)

**On-going Remediation:** Compass, Study Island, Reading in Science Resources, Activity Resources, Graphic Organizers, Manipulatives

**On-Going Enrichment** Internet Science Websites, Advanced Learners Activities in TE

**Vocabulary**
- variation, survival, characteristic, populations, inherit, fossil, anatomical, reproduce
**Grade/Course:** 4  
**Unit: (Description)** Earth Science Unit C and Unit D  

**Standards:**  
- Inquiry and Design 3.2.4.A, B, C, D  
- Earth Sciences 3.5.4.A, B, C, D  
- Environment and Ecology 4.1.4 A, B/ 4.2.4 D/ 4.8.4 C, D/ 4.9.4 A  

**Essential Content and Skills:**  
The learner will  
- Identify systems and describe relationships among parts of a familiar system (e.g., digestive system, simple machines, water cycle).  
- Identify and describe different types of force and motion resulting from these forces, or the effect of the interaction between force and motion.  
- Describe Earth’s relationship to the Sun and the Moon  
- Describe Earth’s different sources of water or describe changes in the form of water.  
- Identify basic weather conditions and how they are measured.  

**Essential Questions:**  
a. What is the evidence that the earth’s system change?  
b. What predictable patterns of change can be observed on and from earth?  

**Big Ideas:** 5  
**Big Idea #5: Earth Systems Theory:** The earth system changes constantly as air, water, soil, and rock interact and the earth is a part of a larger sun, earth, moon system.  
- A system is made of parts and the parts can interact. (S4.A.3.1)  
- Anything on or near the earth is pulled downward by the earth’s gravity. (S4C.3.1.1)  
- Earth rotates on its axis once every 24 hours giving rise to the cycle of night and day and making it seem as if the sun, moon, stars, and planets orbit the earth once each day. (S4D.3.1.1 & 2)  
- Objects in the sky have patterns of movement that can be observed. (S4D.3.1.1 & 2)  
- When liquid water disappears, it turns into a gas (water vapor) in the air. It can reappear as a liquid when cooled or as a solid when cooled further. Clouds and fog are made up of tiny water droplets or ice crystals. When such droplets or crystals get large enough, they fall as precipitation. (S4D.1.3.2; S4D.2.1.1)  
- Water from precipitation can seep into the ground, run off, or evaporate.  
- Most ground water eventually flows through streams, rivers and lakes and returns to the ocean. (S4D.1.3.4)  
- Basic weather conditions Weather variables such as temperature, barometric pressure, wind direction and speed, cloud type, cloud cover, and precipitation can be observed, measured and recorded to identify patterns. change in predictable patterns. (S4D.2.1.2)  
- Rock is composed of different combinations of minerals. (S4D.1.1.3)  
- Soils develop by the breakdown of rocks by weathering and the addition of organic material. Soil also contains many living organisms. (S4D.1.1.3)  
- Earth processes occur over such long time spans and such large areas that maps and models are used to help understand them. (S4A.3.2.1 & 2 & 3)  

**On-Going Enrichment** Internet Science Websites, Advanced Learners Activities in TE
Vocabulary
system, earth system, interact, gravity, rotate, pattern, water vapor, precipitation, seep, runoff, evaporate, groundwater, flows, weather conditions, rocks, minerals, soils, earth processes, models, earth-moon-sun system, predict, evidence

Grade/Course: 4

Unit: (Description) Life Science Unit A and Unit B

Standards:
3.3.4.A, B
Inquiry and Design 3.2.4.A, B, C, D
Biological Sciences 3.3.4.A, B, C, D

Essential Content and Skills:
The learner will

- Identify and describe similarities and differences between living things and their life processes.
- Identify and describe living and nonliving things in the environment and their interaction.
- Describe, explain, and predict change in natural or human-made systems and the possible effects of those changes on the environment.

Essential Questions:
How do the structures and functions of living things allow them to meet their needs?

Big Ideas: 6
Big Idea #6: Cell Theory and Organisms: All living things are made of parts that have specific functions.
- Parts of living things work together to carry out life functions. (S4B.1.1.2)
- Each plant or animal has different structures that serve different functions in growth, survival, and reproduction. (S4B.1.1.2 & 4)
- Most living things need food, water, light, air, and a way to dispose of wastes. (S4B.3.1.2)
- Energy is needed for all organisms to stay alive and grow. (S4B.1.1.3)
- Living things can be grouped based on their similarities and differences. (S4A.2.2.1)
- Tools make it possible to observe living things or the parts of living things that are too small to be seen with the naked eye.

On-going Remediation: Compass, Study Island, Reading in Science Resources, Activity Resources, Graphic Organizers, Manipulatives
On-Going Enrichment Internet Science Websites, Advanced Learners Activities in TE

Vocabulary
functions, structures, energy
Grade/Course: 4
Unit: (Description) Unit F Energy
Standards: 3.4.4.B, C
Inquiry and Design 3.2.4.A, B, C, D
Physical Science, Chemistry and Physics 3.4.4.B

**Essential Content and Skills:**
The learner will
- Recognize basic energy types and sources, or describe how energy can be changed from one form to another.

**Essential Questions:**
How does energy change from one form to another as it moves through a system?

**Big Ideas:**

**Big Idea #7: Forms, Sources, Conversions, and Transformations of Energy:** Energy exists in many forms and can be changed from one form to another (transformed) as it moves through a system.
- Energy can be found in moving objects, light, sound, and heat. (S4C.2.1.1)
- Light from the sun is an important source of energy for living and nonliving systems and some source of energy is needed for all organisms to stay alive and grow. (S4C2.1.2)
- Vibrating objects make sound, and sound can make things vibrate. The bigger the vibration, the louder the sound. The faster the vibrations, the higher the perceived pitch. (S4C.2.1.4)
- To have a sound you need to have a source, a medium, and a receiver. (S4C.2.1.4)
- Moving objects in contact with each other produce heat, and electrical, mechanical, and living things often produce heat. (S4C.2.1.1 & 2)
- When warmer things are put with cooler things, the warmer things get cooler and the cooler things get warmer until they all are at the same temperature. (S4C.2.1.1)
- Electric circuits may produce or use light, heat, sound and magnetic energy. (S4C.2.1.3)
- Electric circuits require a closed pathway through which an electric current can pass. (S4C.2.1.3)
- Materials have different properties. Some materials transfer heat more rapidly than others or some materials conduct electricity better than others. (S4C.1.1.1)

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**On-Going Enrichment:** Internet Science Websites, Advanced Learners Activities in TE

**Vocabulary**
system, energy, vibrate, vibration, sound, pitch, source, medium, receiver, heat, electrical, mechanical, electric circuit, closed pathway, electric current, transfer, conduct, electricity