# *Integrated Science Scope and Sequence*

# *2014/2015*

**Unit 1**

**Topic: Scientific Processes**

**Essential Questions:**

- How do scientists explore the world?
- How are the many types of science organized?
- What are scientific theories, and how are they different from scientific laws?
- How can I think and act like a scientist?
- How do scientists measure things?
- Why is organizing data an important science skill?
- How do scientists handle very large and very small numbers?
- How can you tell the precision of a measurement?
- How are Charts and Graphs interpreted?
- What does the data represent and how does it appear in a graph?

**Connections to Physical Science Book**

Ch 1 Introduction to Science

**Unit 2**

**Topic: Matter and States of Matter**

- How can matter be classified?
- Why are carbon and copper classified as elements?
- How are elements related to compounds?
- What is the difference between a pure substance and a mixture?
- Why are color, volume, and density classified as physical properties?
- Why are flammability and reactivity classified as chemical properties?
- Why is getting a haircut an example of a physical change?
- Why is baking bread an example of a chemical change?
- How can mixtures and compounds be broken down?
- What makes up matter
- What is the difference between a solid , a liquid, and a gas?
- What kind of energy do all particles of matter have?
- What happens when a substance changes from one state of matter to another ?
- What happens to mass and energy during a physical and chemical changes?
- How do fluids exert pressure?
- What force makes a rubber duck float in a bathtub?

**Connections to Physical Science Book**

Ch 2: Matter and Ch 3: States of Matter

**Unit 3**

**Topic: Motion and Forces**

- How is a frame of reference used to describe motion?
- What is the difference between speed and velocity?
- What do you need to know to find the speed of an object?
- How can you study speed by using graphs?
- What changes when an object accelerates?
- How do you calculate the acceleration of an object moving in a straight line?
- How can a graph be used to find acceleration?
- What do scientists identify as the fundamental forces of nature?
- What happens when there is a net force acting on an objects?
- What forces always opposes motion?
- Why is friction sometimes necessary?
- What makes an object speed up, slow down or change directions?
- What determines how much an object speeds up or slow down?
- How are weight and mass related?
- Why do objects fall to the ground when dropped?
- What is the relationship between free-fall acceleration and mass?
- Why does a projectile follow a curved path?
- What happens when an object exerts force on another object?
- How do you calculate the momentum of an object?
- What is the total momentum after objects collide?

**Connection to Physical Science Book**

Ch 11 Motion and Ch 12 Forces

**Unit 4 Work and Energy/ Heat and Temperature**

- How is work calculated?
- What is the relationship between work and power?
- How do machines make work easier?
- What are the six types of simple machines?
- What are the two principal parts of all levers?
- How does using an inclined plane change the force required to do work?
- What simple machines make up a pair of scissors?
- What is the relationship between energy and work?
- Why potential energy is called energy of position?
- What factors does kinetic energy depend on?
- What is nonmechanical energy?
- How does Energy change?
- What is the law of conservation of energy?
- How much of the work done by a machine is actually useful work?
- What does temperature have to do with energy?
- What three temperature scales are commonly used?
- What makes things feel hot or cold?
- How does energy transfer happen?

- What do conductors and insulators do?
- What makes something a good conductor of heat?
- What happens to heat energy when it is transferred?
- What do heat engines do?

**Connections to Physical Science Book**

Ch 13 Work and Energy Ch 14 Heat and Temperature

**Unit 5**

**Topic: The Solar System**

**Essential Questions:**

- Why does the night sky look the way it does from Earth?
- What objects make up the Solar System?
- How does the moon affect Earth?
- How are the inner planets similar to one another?
- What are gas giants?
- What type of bodies lie beyond the gas giants?
- How did Early astronomers understand and describe the solar system?
- Why is the solar system organized like it is?
- What else is in our solar system besides planets?
- How did Earth's moon form?
- How do astronomers find planets around other stars?

***Connections to Physical Science Book***

*Ch 19 Earth and Space Science*

**Unit 7**

**Topic: The Universe**

**Essential Questions:**

- How are stars formed?
- How can we learn about stars if they are so far away?
- What natural cycles do stars go through?
- What is a galaxy, and what is it made of?
- Why are galaxies divided into three major types?
- How do scientists know that galaxies change over time?
- What makes up the universe?
- How did the universe begin?
- How do scientists make predictions about the future of the universe?

**Connections to Physical Science Book**

Ch 20 The Universe

**Unit 8**

**Topic: Planet Earth**

**Essential Questions:**

- How is Earth's interior structured?
- How has the appearance of Earth changed over time?
- What geologic features are common near tectonic plate boundaries?
- Where do most earthquakes occur?
- How do scientists learn about earthquakes and the Earth's interior?
- What is a volcano?
- What materials make up rocks?
- How are scientists able to tell how old a rock is?
- How does physical weathering affect rocks?
- How are rocks affected by chemical weathering?
- What is erosion and what causes it to happen?
- What are the parts of Earth's atmosphere?
- Where did Earth's atmosphere come from?
- What happens to water in the troposphere?
- What is air pressure, and by what terms is it also known?
- What causes wind?
- How do fronts affect the weather?
- How is climate different from weather?

**Connections to Physical Science Book**

Ch 21Planet Earth and Ch 22 The Atmosphere and

**Unit 9 Natural Resources**

**Topic: Using Natural Resources**

**Essential Questions:**

- What makes up an ecosystem?
- How does an ecosystem maintain stability?
- How long does it take for changes in an ecosystem to be reversed?
- What kind of benefits do people get from natural resources?
- Why should energy consumers use alternative energy resources?
- Why is energy conversion never completely efficient?
- What does pollution look like?
- What is air pollution made of?
- What causes water pollution?
- Where does land pollution come from?
- How can we reduce pollution?

**Connections to Physical Science Book**

Ch 23 Using Natural Resources