## TIMSS 2011
### Eighth Grade Science Item Descriptions
developed during the TIMSS 2011 Benchmarking

### Items at Low International Benchmark (400)

#### Biology
- **S02_01**: Recognizes that genetic material is inherited from both parents
- **S12_01A**: Recognizes that influenza is caused by a virus

#### Chemistry
- **S06_01**: Recognizes the chemical formula of carbon dioxide
- **S06_07**: Recognizes a material that would complete an electric circuit
- **S11_06**: Recognizes a material that best conducts both heat and electricity

#### Physics
- **S09_06**: Recognizes the form of energy in a compressed spring

#### Earth Science
- **S01_13**: Identifies from a list of common materials which material breaks down fastest
- **S04_12A**: Recognizes what moves water from an artesian basin to the surface

### Items at Intermediate International Benchmark (475)

#### Biology
- **S01_02**: Explains that an acquired characteristic cannot be passed onto the next generation
- **S02_02**: Recognizes from a diagram showing rock layers, that the fossils found in the deepest layers are likely the oldest
- **S03_01**: Interprets a graph showing changes in pulse rates before, during, and after exercise and recognizes what can be concluded from the graph
- **S07_01**: Recognizes which cells destroy bacteria that enter the body
- **S07_04**: States why exercise is important for good health
- **S08_02**: Analyzes information about a lake ecosystem and explains how an introduced population can effect an existing population
- **S09_01**: Recognizes how vaccination helps prevent illnesses
- **S09_05A**: Based on data in a table, describes the changes in the populations of two organisms over time
- **S10_01**: Recognizes which living thing has growth rings
- **S10_04**: Recognizes from a list of foods which is the best source of calcium
- **S10_05A**: Recognizes why fish eat mosquito larva but not adult mosquitoes
<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S11_01</td>
<td>Recognizes an organism that is a producer</td>
</tr>
<tr>
<td>S11_05C</td>
<td>Recognizes an advantage for a species of butterfly to resemble another species that is toxic to birds</td>
</tr>
</tbody>
</table>

### Chemistry

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S02_08</td>
<td>Recognizes that a fire can be stopped by cutting off the oxygen</td>
</tr>
<tr>
<td>S06_05</td>
<td>Recognizes from a description of indicator color changes that neutralization has occurred</td>
</tr>
<tr>
<td>S11_04</td>
<td>In the context of an investigation, identifies the condition under which nails would rust most</td>
</tr>
<tr>
<td>S11_08</td>
<td>Identifies which of two solutions is more dilute and justifies the selection</td>
</tr>
<tr>
<td>S14_07</td>
<td>Applies knowledge of concentration to explain why one solution is paler than another solution</td>
</tr>
</tbody>
</table>

### Physics

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S03_12C</td>
<td>Draws a conclusion from a line graph showing the results of an investigation into the relative efficiency of two heat sources</td>
</tr>
<tr>
<td>S04_11</td>
<td>Recognizes the placement of a fulcrum that requires the least amount of force to move an object</td>
</tr>
<tr>
<td>S13_10A</td>
<td>Given a diagram showing a ball being thrown upwards, states the force that causes the ball to fall</td>
</tr>
</tbody>
</table>

### Earth Science

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S03_13</td>
<td>Recognizes where active volcanoes are most likely to be found</td>
</tr>
<tr>
<td>S07_10</td>
<td>Given a starting point, orders the processes involved in the water cycle</td>
</tr>
<tr>
<td>S07_11</td>
<td>Recognizes which soil change is due to a natural cause rather than human activity</td>
</tr>
<tr>
<td>S09_09</td>
<td>Recognizes that carbon dioxide is increasing in Earth's atmosphere</td>
</tr>
<tr>
<td>S09_13</td>
<td>Matches each of four processes that take place in the water cycle with the description of the process</td>
</tr>
<tr>
<td>S11_13</td>
<td>Describes a cause of earthquakes</td>
</tr>
<tr>
<td>S11_14</td>
<td>Recognizes that day and night is caused by Earth rotating on its axis</td>
</tr>
<tr>
<td>S14_12</td>
<td>Recognizes that air temperature at high altitudes is very low</td>
</tr>
</tbody>
</table>

### Items at High International Benchmark (550)

### Biology

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S01_03</td>
<td>Explains how snail coloration allows it to blend into its surroundings (camouflage)</td>
</tr>
<tr>
<td>S02_04</td>
<td>Recognizes which food diabetics should be careful about eating</td>
</tr>
<tr>
<td>S02_05</td>
<td>Justifies whether or not planting trees to decrease the amount of carbon dioxide in a city is a good decision</td>
</tr>
<tr>
<td>S03_02</td>
<td>Recognizes that the first organisms that appeared on Earth lived in water</td>
</tr>
<tr>
<td>S03_05A</td>
<td>From a graph showing the population changes over time of two organisms, identifies the time when the population of one of the organisms is at its highest</td>
</tr>
<tr>
<td>S05_04</td>
<td>States one function of the uterus</td>
</tr>
<tr>
<td>S05_11A</td>
<td>Selects the relevant information about two countries from a table, and predicts how their population will change over time</td>
</tr>
<tr>
<td>S06_06</td>
<td>Using a graphical representation of the results of an investigation, describes the relationship between carbon dioxide concentration and rate of photosynthesis</td>
</tr>
<tr>
<td>S07_02</td>
<td>Interprets graph showing a sudden drop in the size of a population of an organism and recognizes the factor that is most likely to have caused this sudden drop</td>
</tr>
<tr>
<td>S08_01</td>
<td>Recognizes which food is the best source of carbohydrates</td>
</tr>
<tr>
<td>S08_03B</td>
<td>States how a crocodile's wide angle of vision helps it to survive in its environment</td>
</tr>
<tr>
<td>S09_05B</td>
<td>Based on data in a table, concludes that there is a population decline and then gives an explanation for the population decline</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>S10_02</td>
<td>Recognizes how puffing their feathers helps birds in cold weather</td>
</tr>
<tr>
<td>S10_05B</td>
<td>Analyzes information about a pond ecosystem and explains that an increase in a predator population can affect all life stages of a prey population</td>
</tr>
<tr>
<td>S12_02</td>
<td>Recognizes what happens to biceps and triceps when an elbow bends</td>
</tr>
<tr>
<td>S13_02</td>
<td>Classifies animals in a list into two groups on the basis of a physical or behavioral characteristic and states the characteristic used</td>
</tr>
<tr>
<td>S13_04A</td>
<td>Indicates in a table which gas is released into the air and which gas is removed from the air during animal respiration</td>
</tr>
<tr>
<td>S13_04C</td>
<td>Indicates in a table which gas is released into the air and which gas is removed from the air during photosynthesis</td>
</tr>
<tr>
<td>S14_03</td>
<td>Recognizes how decomposers get their energy</td>
</tr>
<tr>
<td>S14_04</td>
<td>Given a food chain, explains which organism competes most with humans</td>
</tr>
<tr>
<td>S14_05</td>
<td>For pairs of animals, recognizes predation or competition relationships</td>
</tr>
</tbody>
</table>

**Chemistry**

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<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>S01_05</td>
<td>Explains what causes a balloon to inflate when sodium bicarbonate in the balloon mixes with vinegar</td>
</tr>
<tr>
<td>S02_07</td>
<td>Identifies substances as metals based on their physical properties</td>
</tr>
<tr>
<td>S03_06</td>
<td>Given the chemical formula for sulfuric acid, completes a table to show the number of atoms of each element in a molecule of the acid</td>
</tr>
<tr>
<td>S04_05</td>
<td>Recognize a property of most nonmetals</td>
</tr>
<tr>
<td>S05_05</td>
<td>Recognizes which diagram best represents the structure of water molecules</td>
</tr>
<tr>
<td>S06_11</td>
<td>Recognizes a chemical process involving energy absorption</td>
</tr>
<tr>
<td>S07_06</td>
<td>Identifies a property of metals and describes how this property can be used to determine whether an unknown substance is a metal or nonmetal</td>
</tr>
<tr>
<td>S08_06</td>
<td>From a table of densities, identifies and explains which substance will float on water</td>
</tr>
<tr>
<td>S08_08</td>
<td>Recognizes which process makes bronze dark and dull over time</td>
</tr>
<tr>
<td>S09_08B</td>
<td>In the context of an investigation about the gold content of jewelry, selects information from a table of properties of gold alloys to complete a table relating the density of alloys to number of carats and percentage of gold in each piece of jewelry</td>
</tr>
<tr>
<td>S09_08C</td>
<td>In the context of an investigation about the gold content of jewelry, uses previously selected information and follows an example to calculate the mass of gold in jewelry</td>
</tr>
<tr>
<td>S10_07</td>
<td>From a table of melting and boiling points of three substances, identifies the state of each substance at a given temperature</td>
</tr>
<tr>
<td>S10_09</td>
<td>Recognizes an everyday activity that is a chemical process releasing energy</td>
</tr>
<tr>
<td>S12_05</td>
<td>From a list of symbols and formulas, recognizes which are elements and which are compounds</td>
</tr>
<tr>
<td>S12_07</td>
<td>Recognizes an everyday occurrence involving chemical change</td>
</tr>
</tbody>
</table>

**Physics**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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<tbody>
<tr>
<td>S01_14</td>
<td>Recognizes what happens to gas molecules when temperature increases</td>
</tr>
<tr>
<td>S03_10</td>
<td>Recognizes what happens to molecules of a liquid as the liquid cools</td>
</tr>
<tr>
<td>S08_10</td>
<td>Given the density of two objects and three liquids, and diagrams showing the objects floating or sinking in the liquids, identifies each liquid</td>
</tr>
<tr>
<td>S09_12</td>
<td>Explains that there are forces acting on students sitting on a wall</td>
</tr>
<tr>
<td>S10_10</td>
<td>Recognizes the orientation of a hidden mirror given rays of light reflecting</td>
</tr>
<tr>
<td>S11_07</td>
<td>Using a table showing the speed of sound through different media and knowledge of the state of each medium, recognizes a conclusion that may be drawn about the relative speed of sound</td>
</tr>
<tr>
<td>S11_09</td>
<td>Recognizes why a helium balloon rises into the air</td>
</tr>
<tr>
<td>S11_12</td>
<td>Explains why lightning is seen before thunder is heard during an electrical storm</td>
</tr>
<tr>
<td>S12_09</td>
<td>Recognizes how to increase the strength of an electromagnet</td>
</tr>
<tr>
<td>S12_10</td>
<td>In the context of an investigation, explains the effect of temperature on diffusion</td>
</tr>
<tr>
<td>Item Code</td>
<td>Description</td>
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</tr>
<tr>
<td>S12_11</td>
<td>Applies knowledge about the relationship between depth and water pressure to recognize a conclusion about the pressure at different depths</td>
</tr>
<tr>
<td>S13_07</td>
<td>Recognizes the pathway of light required for an object to be seen</td>
</tr>
<tr>
<td>S13_08</td>
<td>Recognizes the everyday object most likely to be used as a lever</td>
</tr>
<tr>
<td>S14_09B</td>
<td>Explains that in a parallel arrangement of two bulbs, one bulb failing does not affect the other bulb</td>
</tr>
<tr>
<td>S14_10</td>
<td>Recognizes the best explanation of why two bar magnets repel each other</td>
</tr>
</tbody>
</table>

**Earth Science**

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<tr>
<th>Item Code</th>
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<tbody>
<tr>
<td>S01_10</td>
<td>Recognizes the main difference between planets and moons</td>
</tr>
<tr>
<td>S01_12</td>
<td>States one way a volcanic eruption impacts the environment</td>
</tr>
<tr>
<td>S02_12</td>
<td>Recognizes how holes in some volcanic rocks were formed</td>
</tr>
<tr>
<td>S05_09</td>
<td>Recognizes the major cause of tides</td>
</tr>
<tr>
<td>S05_10A</td>
<td>Interprets a contour map to recognize a topographical representation of a mountain top</td>
</tr>
<tr>
<td>S06_17</td>
<td>States two factors related to the water cycle (evaporation, transportation, and condensation) to explain how water from the sea ended up as rain on land</td>
</tr>
<tr>
<td>S08_13</td>
<td>Recognizes from a graph of average monthly temperature which city is most likely to be located at the equator</td>
</tr>
<tr>
<td>S10_13</td>
<td>Recognizes which energy source is non-renewable</td>
</tr>
<tr>
<td>S13_14</td>
<td>Recognizes a consequence of the gravitational pull of the moon on Earth</td>
</tr>
<tr>
<td>S14_11A</td>
<td>From a table of planetary data, and using knowledge about the relation between rotation and day length, recognizes which planet has the shortest day length</td>
</tr>
</tbody>
</table>

**Items at Advanced International Benchmark (625)**

**Biology**

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S01_06</td>
<td>Recognizes a way to provide the body with long-term immunity</td>
</tr>
<tr>
<td>S02_03</td>
<td>Recognizes which described experiment would show that water travels through a plant into the air</td>
</tr>
<tr>
<td>S03_03</td>
<td>Applies knowledge of competition to explain the importance of removing weeds from a field where crops are sown</td>
</tr>
<tr>
<td>S03_04</td>
<td>States a life function of a single-celled organism, other than taking in nutrients to produce energy</td>
</tr>
<tr>
<td>S03_05B</td>
<td>Interprets a graph showing the population changes of two organisms over time and describes how the changes in population sizes are related</td>
</tr>
<tr>
<td>S04_01</td>
<td>Recognize the function of shivering</td>
</tr>
<tr>
<td>S04_03B</td>
<td>In the context of an investigation about cellular respiration, identifies the gas produced and its source</td>
</tr>
<tr>
<td>S04_04</td>
<td>Applies knowledge about heredity to explain why offspring have traits like their parents</td>
</tr>
<tr>
<td>S05_01</td>
<td>Identifies the criterion used for classifying animals into two groups</td>
</tr>
<tr>
<td>S05_02</td>
<td>Recognizes the definition of an organism that is a producer</td>
</tr>
<tr>
<td>S05_11C</td>
<td>Given a table showing demographic data and data on grain production and oil consumption for two countries, predicts how a change in population in each country will affect pollution over the next 10 years</td>
</tr>
<tr>
<td>S06_02</td>
<td>Recognizes the function of a labeled part of a plant cell</td>
</tr>
<tr>
<td>S06_03</td>
<td>Recognizes an organ in a frog that has a function similar to that of lungs</td>
</tr>
<tr>
<td>S07_03</td>
<td>States that light is the environmental factor that has an effect on pupil size and identifies the diagram that illustrates the effect</td>
</tr>
<tr>
<td>S07_13</td>
<td>Recognizes the likely cause of increased algae growth in a lake</td>
</tr>
<tr>
<td>S08_04</td>
<td>States one similarity of the life cycles of a bird and a frog</td>
</tr>
<tr>
<td>S08_05</td>
<td>Recognizes an explanation for disappearance of a trait over time</td>
</tr>
<tr>
<td>S09_02</td>
<td>Applies knowledge of ecosystems to explain why birds of prey cannot survive in an environment without plants</td>
</tr>
<tr>
<td>Scale</td>
<td>Anchor Point</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>01</td>
<td>Recognizes a function of the cell membrane</td>
</tr>
<tr>
<td>02</td>
<td>Applies knowledge about the evolution of anatomical structures to recognize which conclusion is best supported by figures of limbs from different animals</td>
</tr>
<tr>
<td>06</td>
<td>Recognizes pictures of organ systems</td>
</tr>
<tr>
<td>08</td>
<td>Recognizes and describes an example of asexual reproduction</td>
</tr>
<tr>
<td>10</td>
<td>Recognizes an organism in which oxygen and carbon dioxide are exchanged between air and blood through the skin</td>
</tr>
<tr>
<td>03A</td>
<td>In the context of an observation of butterflies and plants, explains that the larval stage is the growth stage</td>
</tr>
<tr>
<td>03B</td>
<td>In the context of an observation of butterflies and plants, explains that the egg or pupa is the development stage</td>
</tr>
<tr>
<td>03</td>
<td>Recognizes a characteristic in humans that is acquired</td>
</tr>
<tr>
<td>01</td>
<td>Recognizes a function shared by lungs, skin, and kidneys</td>
</tr>
<tr>
<td>04B</td>
<td>Indicates in a table which gas is released into the air and which gas is removed from the air during plant respiration</td>
</tr>
<tr>
<td>05</td>
<td>Using the equipment and materials shown in a diagram, describes an investigation to find out how fertilizer affects the growth of plants</td>
</tr>
<tr>
<td>01</td>
<td>States two reasons why male penguins’ incubation behavior helps their eggs survive</td>
</tr>
<tr>
<td>02</td>
<td>Recognizes an organism that is made up of cells with cell walls</td>
</tr>
</tbody>
</table>

**Chemistry**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Anchor Point</th>
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</thead>
<tbody>
<tr>
<td>04</td>
<td>Recognizes the graph that most likely shows the effect of temperature on the solubility of sugar in water</td>
</tr>
<tr>
<td>06</td>
<td>Recognizes what happens to atoms in an object if the shape of the object changes</td>
</tr>
<tr>
<td>09</td>
<td>Recognizes the property of water that has the most effect on splitting a rock</td>
</tr>
<tr>
<td>08</td>
<td>Recognizes the definition of a compound</td>
</tr>
<tr>
<td>11</td>
<td>Describes two things that might be observed as a chemical reaction takes place</td>
</tr>
<tr>
<td>06</td>
<td>Recognizes the reason for the difference in taste between distilled and drinking water</td>
</tr>
<tr>
<td>07</td>
<td>Identifies which everyday liquids do and do not neutralize a base</td>
</tr>
<tr>
<td>05</td>
<td>Recognizes the diagram that best represents the hierarchy in the particulate structure of matter</td>
</tr>
<tr>
<td>07</td>
<td>Recognizes a property that is common to both acids and bases</td>
</tr>
<tr>
<td>08</td>
<td>In the context of an investigation about the gold content of jewelry, describes the measurements to be taken using a graduated cylinder and water to find the volume of the jewelry</td>
</tr>
<tr>
<td>11</td>
<td>Applies knowledge of conservation of mass during a neutralization reaction to explain what happens to mass when new substances are formed</td>
</tr>
<tr>
<td>11</td>
<td>Applies knowledge of density to explain why oil floats on water</td>
</tr>
<tr>
<td>06</td>
<td>Identifies an element as a metal or a nonmetal based on some physical properties and predicts one additional property</td>
</tr>
<tr>
<td>06</td>
<td>Recognizes a mixture</td>
</tr>
<tr>
<td>09</td>
<td>Applies knowledge of expansion of water during freezing to explain why a bottle full of water cracked when it was left in a freezer</td>
</tr>
<tr>
<td>12</td>
<td>Applying knowledge of heat conduction, explains why ice will stay frozen in a wooden container longer than in a metal container</td>
</tr>
<tr>
<td>08</td>
<td>Recognizes an everyday process that is an example of a physical change</td>
</tr>
</tbody>
</table>

**Physics**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Anchor Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>08</td>
<td>Recognizes why some railway tracks are laid down with gaps between lengths</td>
</tr>
<tr>
<td>09</td>
<td>States what happens to the sound of a bell in a jar when air is removed from the jar and explains why</td>
</tr>
<tr>
<td>10</td>
<td>Given the densities of two liquids and an object, explains in which liquid the object will float</td>
</tr>
<tr>
<td>11B</td>
<td>In the context of water flowing from a tank to a water wheel, states the kind of energy the water has just before it hits the wheel</td>
</tr>
</tbody>
</table>
In the context of water flowing from a tank to a water wheel, states one change to the system that will make the wheel rotate faster.

Given two metal bars, one of which is a magnet, describes how to use the magnet to determine if the other metal bar is a magnet.

Recognizes where to place a thermometer in a liquid to take a reading while conducting an investigation.

In the context of an investigation into the relative efficiency of two heat sources, identifies a variable that was controlled.

Given two unknown samples and using knowledge that only gases fill the available space, recognizes a statement about the spacing of particles in the samples.

Applies knowledge of heat transfer to recognize the outside temperature of containers made of materials with different thermal properties.

Identifies the process by which heat is transferred along a metal rod.

From a description of an investigation about magnets, recognizes how the strength of a magnet is defined in the investigation.

Identifies from a list of five characteristics or properties at least four that change or remain the same as a liquid changes into a gas.

Explains why an unwrapped block of ice will melt faster than a block of ice wrapped in newspaper.

On a diagram of a person looking through a periscope, draws the path and direction of a light ray through the periscope.

Recognizes that the force of gravity acts on a person regardless of position and movement.

Recognizes why gases are easier to compress than solids and liquids.

Interprets a diagram and describes the direction of heat flow in metals.

Describes a way to distinguish between fresh water and salt water, using two hot plates and without using a thermometer.

Explains the orientation of a rectangular block which exerts the greatest pressure on the ground.

States one reason why a bulb in a diagram of a circuit does not light.

Recognizes the correct statement about battery life and bulb brightness in two given circuits.

Given a diagram showing weather conditions at different elevations on a mountain, identifies the most likely location of a jungle.

States what fossil evidence would support the idea that two continents were once joined.

States one advantage of using the terracing method of farming.

Recognizes the cause of a decrease in water flow in an artesian well over time.

Explains why water from an artesian well can be hot.

Draws the path and direction of a river from a mountain to a bay on a contour map.

Describes two changes in atmospheric conditions that occur with increasing elevation.

States one condition below Earth’s crust which can be inferred from volcanic eruptions.

Recognizes what causes the moon to appear to change shape.

States two advantages for plants to have roots that go down into the subsoil.

Explains why an object’s weight is less on the moon than on the Earth.

Recognizes how a shadow changes as the Sun moves.

Draws an arrow on a map to show the direction a river flows and explains why it flows in this direction.

Recognizes the source of energy for the water cycle.

Explains one way trees protect soil from erosion.

Draws a conclusion about the distances of planets from the Sun from a table of their revolution times.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Anchoring Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biology</strong></td>
<td></td>
</tr>
<tr>
<td>S01_01</td>
<td>Recognizes the purpose of cellular respiration</td>
</tr>
<tr>
<td>S04_02</td>
<td>Matches mammals, amphibians, fish, and birds to their characteristic features</td>
</tr>
<tr>
<td>S04_03A</td>
<td>In the context of an investigation about cellular respiration, interprets the role of parts of an experimental set-up to provide a controlled condition</td>
</tr>
<tr>
<td>S05_03</td>
<td>States two conditions needed for seeds to germinate</td>
</tr>
<tr>
<td>S05_11B</td>
<td>Given a table showing demographic data and data on grain production and oil consumption for two countries, predicts how a change in population in each country will affect land use over the next 10 years</td>
</tr>
<tr>
<td>S06_04</td>
<td>Recognizes the word equation that summarizes the process of respiration</td>
</tr>
<tr>
<td>S06_09</td>
<td>Designs an investigation to test a hypothesis about whether red and green peppers are produced by the same type of pepper plant</td>
</tr>
<tr>
<td>S08_03A</td>
<td>Explains how the fact that current crocodiles look like ancient crocodiles means they are well suited to their environment</td>
</tr>
<tr>
<td>S09_04</td>
<td>Recognizes an explanation for a change over time in a physical characteristic of an organism</td>
</tr>
<tr>
<td>S12_01B</td>
<td>Explains that influenza is spread rapidly around the world due to travel and person-to-person interaction</td>
</tr>
<tr>
<td>S12_04</td>
<td>Explains how flooding leads to a shortage of drinking water and the spread of disease</td>
</tr>
<tr>
<td>S13_03</td>
<td>Recognizes which organelle produces energy for the cell</td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
<td></td>
</tr>
<tr>
<td>S05_06</td>
<td>States one thing that could be observed that shows energy has been released during a chemical reaction</td>
</tr>
<tr>
<td>S06_10</td>
<td>Classifies six examples of matter as elements, compounds, or mixtures</td>
</tr>
<tr>
<td>S10_08</td>
<td>Given two proposed methods for separating a mixture of small pieces of two metals, identifies which method will work and which will not and explains why</td>
</tr>
<tr>
<td>S14_06</td>
<td>Given their chemical formulas, recognizes a compound with the same number of atoms as another compound</td>
</tr>
<tr>
<td><strong>Physics</strong></td>
<td></td>
</tr>
<tr>
<td>S01_07</td>
<td>Recognizes why a closed empty plastic bottle collapses when brought from a mountain top to a valley</td>
</tr>
<tr>
<td>S02_11A</td>
<td>In the context of water flowing from a tank to a water wheel, states the kind of energy the water has when it is in the tank</td>
</tr>
<tr>
<td>S03_07</td>
<td>Applies knowledge of condensation of water vapor to explain why a liquid appeared on the cool outside surface of a pitcher</td>
</tr>
<tr>
<td>S04_10</td>
<td>From a diagram of an object floating in different liquids, explains that the portion of the object which is submerged depends on the density of the liquid</td>
</tr>
<tr>
<td>S05_07</td>
<td>Interprets a circuit diagram with bulbs in parallel and in series to recognize a correct statement about current in the bulbs</td>
</tr>
<tr>
<td>S06_15</td>
<td>Recognizes in which medium light travels fastest</td>
</tr>
<tr>
<td>S07_07</td>
<td>Recognizes the sequence of energy conversions that takes place in a battery-operated flashlight</td>
</tr>
<tr>
<td>S07_08</td>
<td>Interprets a diagram showing air and water in a sphere attached to a U-tube and explains what will happen to the water level in the open tube when the air in the sphere is heated</td>
</tr>
<tr>
<td>S09_10</td>
<td>Recognizes what happens to the mass and volume of water when it freezes</td>
</tr>
<tr>
<td>S10_11</td>
<td>From a picture, recognizes the correct statement about the relative motion of an object seen from two frames of reference</td>
</tr>
<tr>
<td>S12_08</td>
<td>Recognizes the property of a gas in a dented ping pong ball that stays constant if the ball is heated</td>
</tr>
<tr>
<td>S13_10B</td>
<td>Recognizes that a falling ball will not bounce as high as the point from which it fell and explains why</td>
</tr>
<tr>
<td>S13_11</td>
<td>Calculates resistance from current and voltage</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>S03_14</td>
<td>Recognizes a diagrammatic representation of the sun, moon, and Earth during an eclipse of the moon</td>
</tr>
<tr>
<td>S08_14</td>
<td>Recognizes an explanation for the fact that a constellation visible one night is no longer visible six months later</td>
</tr>
<tr>
<td>S12_14</td>
<td>Explains that the moon travels around the Sun, referring to the moon orbiting the Earth and the Earth orbiting the Sun</td>
</tr>
</tbody>
</table>