

Handouts

UNIT 2, MODULE 1: Selecting Words

TEKS Connections

English Language Arts

Grades 6–8: (2)

Reading/Vocabulary Development. Students understand new vocabulary and use it when reading and writing.

Various student expectations for this statement could apply.

SOURCE: Texas Education Agency (TEA), 2008a.

Social Studies

Grades 6–7:

(22) Social studies skills. The student communicates in written, oral, and visual forms. The student is expected to:

(A) use social studies terminology correctly;

In the social studies TEKS, vocabulary is addressed as “terminology.”

Grade 8:

(30) Social studies skills. The student communicates in written, oral, and visual forms. The student is expected to:

(A) use social studies terminology correctly;

In the social studies TEKS, vocabulary is addressed as “terminology.”

SOURCE: TEA, 2010.

Science

Grade 6 example:

(5) Matter and energy. The student knows the differences between elements and compounds. The student is expected to:

(A) know that an element is a pure substance represented by chemical symbols.

Vocabulary is embedded in the Science TEKS, as students must know the words for concepts, processes, and scientific equipment. The example above includes these vocabulary terms: "element," "pure," "substance," and "chemical symbols."

Grade 7 example:

(5) Matter and energy. The student knows that interactions occur between matter and energy. The student is expected to:

(A) recognize that radiant energy from the Sun is transformed into chemical energy through the process of photosynthesis.

Vocabulary is embedded in the Science TEKS, as students must know the words for concepts, processes, and scientific equipment. The example above includes these vocabulary terms: "radiant energy," "chemical energy," and "photosynthesis."

Grade 8 example:

(5) Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to:

(A) describe the structure of atoms, including the masses, electrical charges, and locations, of protons and neutrons in the nucleus and electrons in the electron cloud.

Vocabulary is embedded in the Science TEKS, as students must know the words for concepts, processes, and scientific equipment. The example above includes these vocabulary terms: "electrical charge," "proton," "neutron," "nucleus," "electron," and "electron cloud."

SOURCE: TEA, 2009.

Mathematics

Grade 6:

(12) Underlying processes and mathematical tools. The student communicates about Grade 6 mathematics through informal and mathematical language, representations, and models.

The student is expected to:

(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.

Grade 7:

(14) Underlying processes and mathematical tools. The student communicates about Grade 6 mathematics through informal and mathematical language, representations, and models.

The student is expected to:

(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.

Grade 8:

(15) Underlying processes and mathematical tools. The student communicates about Grade 6 mathematics through informal and mathematical language, representations, and models.

The student is expected to:

(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.

SOURCE: TEA, 2006.

English Language Proficiency Standards (ELPS) Connections

The student is expected to:

1(A) use prior knowledge and experiences to understand meanings in English.

1(E) internalize new basic and academic vocabulary by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment.

3(D) speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency.

4(D) use prereading supports such as graphic organizers, illustrations, and pretaught topic-related vocabulary and other prereading activities to enhance comprehension of written text.

SOURCE: TEA, 2007.

College and Career Readiness Standards (CCRS) Connections

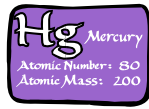
II. Reading

B(1) Identify new words and concepts acquired through study of their relationships to other words and concepts.

SOURCE: TEA, 2008b.

The Problem with Mercury

Student Fact Sheet D-6



The Problem with Mercury

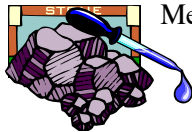


A God, a Planet, and a Metal



The word mercury has several meanings. In ancient Rome, Mercury was the name of a god that could run as fast as the wind. In our solar system, Mercury is a small, fast-moving planet that is closest to the sun. Mercury is also the name for a metal, or an element or chemical found in the Earth's crust. It usually comes from the mineral or rock called cinnabar. When heated at high temperatures, mercury is removed or extracted from cinnabar.

Quicksilver



Mercury is the only metal on earth that is liquid at room temperature. Since mercury looks like shiny liquid silver, it is sometimes called quicksilver. Mercury is used for many different things around the world. It is used to mine or extract gold from ore, which are rocks that contain metals like gold. Mercury is also used to make or manufacture different things like computer monitors and fluorescent lights, and it is used to make dental fillings. Because mercury expands or gets bigger when heated, it is also used in thermometers. As the temperature rises, so does the mercury.

Mad as a Hatter



Mercury is a very poisonous substance. In fact, Mercury is one of the most deadly poisons on Earth. Inhaling mercury vapors or gases, and eating or ingesting mercury can be very dangerous and even deadly. In the 1800's, mercury was used to manufacture

felt hats in England and the Eastern United States. Many of the factory workers inhaled the mercury fumes. It damaged their brains and they became brain damaged or "mad." The term "mad as a hatter" comes from the hat makers that got brain damage from using mercury to make all those hats!

Mercury in our Environment



Even though mercury exists naturally in the Earth's crust and is sometimes put into the air when volcanoes erupt, the largest cause of mercury pollution is the burning of fossil fuels like coal. When coal is burned to fuel factories and power plants, mercury gets released into the air as air pollution. When mercury pollutes the land or air, rain eventually washes it into streams, lakes, rivers and oceans, where it eventually enters the food chain.

Mercury in our Food



The food chain is the natural order of how living things or organisms get food. The food chain shows how some animals eat plants and other animals to survive. For example, in the San Francisco Bay, one food chain begins with a tiny organism called plankton. Plankton live in the bay and provide food for many different underwater animals like minnows which are baby fish of any kind. The minnows that eat plankton then become food for larger fish, such as perch or striped bass. These large fish are then eaten by even larger fish like sharks. If plankton get contaminated or polluted with mercury, this contamination will spread to the minnows

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that eat the plankton, which in turn will contaminate the larger fish. This then contaminates the shark. This process of contamination moving up the food chain is called biological magnification. By the time the toxin or poison has moved up the food chain, it has become very concentrated or magnified.

Mercury Magnified



When mercury moves up the food chain it gathers in the bodies of the fish and animals that have been contaminated.

Because human beings eat fish, many of them become contaminated with mercury too. In fact, the most famous case of mercury poisoning occurred during the 1950s and 1960s in Minamata, Japan. Thousands of people became severely poisoned with mercury after eating contaminated fish out of the Minamata Bay. A nearby chemical factory had been discharging or dumping mercury into the bay for over thirty years and it contaminated the fish that lived there. Local villagers ate fish from the bay and because their bodies absorbed the mercury in the fish, it made them very sick. Over the years more than a thousand people died from this mercury poisoning, with thousands others being sick or born with birth defects.

Mercury in the San Francisco Bay



Although not as contaminated as the Minamata Bay in Japan, the San Francisco Bay is also contaminated with mercury. Gold miners in the 1800's used mercury when they were mining for gold in the Sierra foothills. Much of this mercury came from a local mine in San Jose. A lot of mercury from the goldmines and from the mercury mine was washed down hillsides into

streams, rivers and eventually reached the San Francisco Bay. Mercury from these old mines is the biggest cause of mercury pollution in the bay. Because of this, fish that live in the San Francisco Bay are contaminated with mercury and scientists warn us not to eat them. The safest fish to eat out of the bay are migrating fish, or fish that travel long distances from one place to the other and are just passing through the bay. Migrating fish in the San Francisco Bay include wild salmon and herring.

Protecting our Health



There are many things we can do to help protect the environment and our health from the dangers of mercury. The first thing we can do is eat less or reduce the amount of fish that usually contain a lot of mercury. These fish include: tuna, mackerel, shark, marlin, and swordfish. Instead of eating tuna sandwiches several days a week, only eat them once a month. Choose other foods to eat that are tasty and nutritious, especially foods that are lower on the food chain like fruits, vegetables, grains, nuts and legumes or beans. For example, a peanut butter and banana sandwich is made with fruit, grains and legumes!

Keeping it Safe



Another thing we can do is to never play with mercury or use it for certain hobbies. We can also stop using mercury thermometers and use digital ones instead. If a mercury thermometer breaks, leave the area and tell your parents to visit www.noharm.org/details.cfm?type=document&id=309 so they can learn how to clean it up as safely as possible. Learn more about mercury at: www.sfenvironment.org

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Reflection Log

Think about how you might use the information presented in this module to plan instruction and support students' academic literacy needs. What seemed particularly useful to you? What ideas were new or interesting? What confirmed or challenged your previous beliefs? What questions do you still have?

Use the lines below to record your thoughts.

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