

Science Lesson Plan Middle School

Objective	The students will create a density tower and understand how density works with liquids.
TEKS	<p>§112.18. Science, Grade 6, Adopted 2017.</p> <p>(a) Introduction.</p> <p>(1) The strands for Grade 6 include the following.</p> <p>(B) Matter and energy.</p> <p>(ii) Elements are classified as metals, nonmetals, and metalloids based on their physical properties. The elements are divided into three groups on the Periodic Table. Each different substance usually has a different density, so density can be used as an identifying property. Therefore, calculating density aids classification of substances.</p> <p>(b) Knowledge and skills.</p> <p>(6) Matter and energy. The student knows matter has physical properties that can be used for classification. The student is expected to:</p> <p>(A) compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability;</p> <p>(B) calculate density to identify an unknown substance;</p> <p>§112.19. Science, Grade 7, Adopted 2017.</p> <p>(a) Introduction.</p> <p>(1) The strands for Grade 7 include the following:</p> <p>(A) Scientific investigation and reasoning.</p> <p>(i) To develop a rich knowledge of science and the natural world, students must become familiar with different modes of scientific inquiry, rules of evidence, ways of formulating questions, ways of proposing explanations, and the diverse ways scientists study the natural world and propose explanations based on evidence derived from their work.</p> <p>(ii) Scientific investigations are conducted for different reasons. All investigations require a research question, careful observations, data gathering, and analysis of the data to identify the patterns that will explain the findings. Descriptive investigations are used to explore new phenomena such as conducting surveys of organisms or measuring the abiotic components in a given habitat. Descriptive statistics include frequency, range, mean, median, and mode. A hypothesis is not required in a descriptive investigation. On the other hand, when conditions can be controlled in order to focus on a single variable, experimental research design is used to determine causation. Students should experience both types of investigations and understand that different scientific research questions require different research designs.</p> <p>(iii) Scientific investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and the methods, models, and conclusions built from these</p>

investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. Models have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(C) Force, motion, and energy. Force, motion, and energy are observed in living systems and the environment in several ways. Interactions between muscular and skeletal systems allow the body to apply forces and transform energy both internally and externally. Force and motion can also describe the direction and growth of seedlings, turgor pressure, and geotropism.

Catastrophic events of weather systems such as hurricanes, floods, and tornadoes can shape and restructure the environment through the force and motion evident in them. Weathering, erosion, and deposition occur in environments due to the forces of gravity, wind, ice, and water.

§112.20. Science, Grade 8, Adopted 2017.

(b) Knowledge and skills.

(3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:

(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;

(B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;

(C) identify advantages and limitations of models such as size, scale, properties, and materials; and

(D) relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.

(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;

(B) identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity;

(C) interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements;

(D) recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts; and

(E) investigate how evidence of chemical reactions indicates that new substances with different properties are formed and how that relates to the law of conservation of mass.

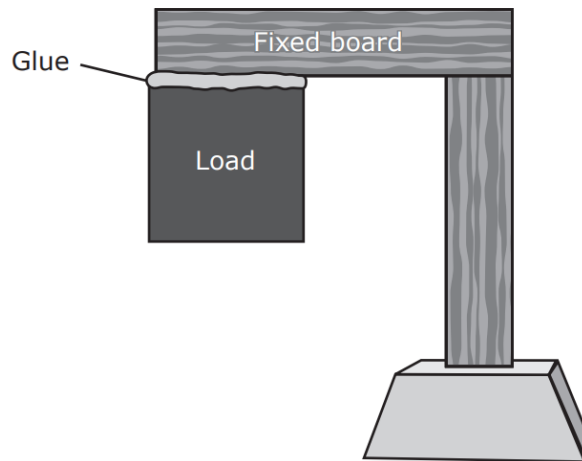
STAAR

C

1 A cook heats a meal in a microwave oven. What energy transformations occur between the microwave oven and the meal?

- A** Electrical energy \longrightarrow light energy \longrightarrow chemical energy
- B** Chemical energy \longrightarrow thermal energy \longrightarrow light energy
- C** Electrical energy \longrightarrow electromagnetic energy \longrightarrow thermal energy
- D** Chemical energy \longrightarrow electromagnetic energy \longrightarrow chemical energy

15 The unusual strength of a glue makes it able to hold a heavy object, or load, as shown in the diagram below.



D

If the load exerts a strong downward force, the glue —

- A** destroys the force
- B** exerts a stronger downward force
- C** causes the load to accelerate upward
- D** exerts an upward force that is equal to the downward force

J

36 A manufacturer selected a metal to use in producing a lightweight button for clothing. A metal that has a density of 2.71 g/cm^3 was selected.

Metal Data

Metal	Mass (g)	Volume (cm^3)
1	22.1	3.00
2	42.0	4.00
3	9.32	5.00
4	8.13	3.00

Which of the metals was selected?

- F** Metal 1
- G** Metal 2
- H** Metal 3
- J** Metal 4

Struggling Learners

- The struggling learners will be allowed to only write one sentence describing today's events.
- The struggling students will be allowed to discuss their favorite liquid, for an exit ticket.

Advanced Learners

- The advanced learners will be required to paragraph during their critical write.
- The advanced learners will be required to write a few sentences describing why and how some liquids float and some did not.

Helpful Links

[Ocean Energy](#)

Engage

As the students are walking in, I will hand every other student a vial with liquid and tell them to sit down as normal. The off set students that do not receive a vial will be given a piece of paper with a set of instructions. Once everyone is seated the activity will began. The most important rule is NO TALKING!

Explore

The instruction sheet students will walk around the room attempting to find the vial that matches the description on their paper. There will be nine vials: honey, maple syrup, light corn syrup, baby oil, dish soap, milk, water, ice cube, and vegetable oil.

Explain

Once all of the vial and instruction sheet students have found the correct partner. They will line up based on the density number that is on the information sheet. They will again not be able to talk whatsoever.

Elaborate

When all of the students are in the correct order each pair will walk to the front and pour their liquid into a large cylinder. All students will eventually pour their liquid into the cylinder. The pouring of

	the liquids will be shown on the projector so all students have the ability to watch. The students will be able to analyze how some liquids float and some sink.
Evaluate	The students will do a quick write, as their exit ticket and daily grade, as to what order the ingredients needed to be poured, into the cylinder.