

Science Centers



Grade 4

Science Strand A

Density & Volume

Benchmark SC. A. 1.2.1 The student determines that the properties of materials (e.g., density and volume) can be compared and measured (e.g., using rulers, balances, and thermometers).

Task: Students will determine the density of a variety of objects.

Materials:

Triple beam balance

Variety of objects (paper clips, coins, rocks, marbles, cork, blocks of wood, plastic lid, pens, rubber stopper)

One gallon plastic container or small plastic terrarium/aquarium

Enough water to fill one half of the aquarium

Pencil

Data Sheet



Procedure:

1. Create a chart with four columns. Label the 1st column "Objects", the 2nd column "Weight", the 3rd column "Prediction" and the 4th column Actual.
2. List the items in this center in the first column of your chart.
3. Weigh each object on the list and record the weight in the 2nd column next to the object.
4. Predict which ones will float and sink. Write the letter F for float and S for sink in the 3rd column next to each object.
5. Place each object one at a time in the container of water.
6. Record if the object floated or sank next to each object in the 4th column of your chart. How well did you do?
7. Write a conclusion.

Density & Volume Assessment

Benchmark—SC.A. 1.2.1

Circle the correct answer.

1. Why do some objects float in water?
 - A. Some objects are less dense than the volume water in which they are placed.
 - B. The weight of an object determines if it will float.
 - C. Some objects are denser than the volume of water in which they are placed.
 - D. The size of an object determines if it will float.

2. The density of an object depends on which of the following?
 - A. mass and weight
 - B. mass and volume
 - C. volume
 - D. weight



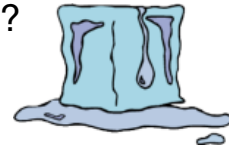
Write what you learned by doing this experiment in your science journal.

Science Strand A

Changes in the States of Matter

Benchmark SC.A. 1.2.2 The student knows that common materials (e.g., water) can be changed from one state to another by heating and cooling.

Task: How long can you keep an ice cube from melting?



Materials:

One ice cube per student (may be kept in a cooler in the classroom or in a thermos)

packing material (peanuts, bubble wrap, aluminum foil, newspaper, etc.)

tape



Procedure:

1. Select materials that you think will keep your ice cube from melting.
2. Predict how long this material will keep ice from melting. Record your prediction.
3. Wrap your ice cube in the material you selected.
4. Time how long it took for the ice cube to melt.
5. Record the time. How did the actual melting time compare with the time in your prediction?
6. Compare your results with others in your class.
7. Write a conclusion.

Changes in States of Matter Assessment

Benchmark—SC.A. 1.2.2

Circle the correct answer.

1. Melting is the changing of a solid to a liquid. When does melting occur?

- A. when a substance loses heat energy
- B. when a substance absorbs heat energy
- C. when a substance becomes more dense
- D. when a substance loses mechanical energy

2. Freezing is the changing of a liquid to a solid. When does freezing occur?

- A. when a substance loses heat energy
- B. when a substance absorbs heat energy
- C. when a substances becomes less dense
- D. when a substances loses mechanical energy

Think about all the things that people use to keep soft drinks cold when there is no refrigeration. What do you use to keep a soft drink cold? Explain how it works to keep the drink cold.

Science Strand A

Physical Changes

Benchmark SC. A. 1.2.4 The student knows that different materials are made by physically combining substances and that different objects can be made by combining different materials.

Task: How can you physically change paper?

Materials:

Paper
Pencil



Procedure:

1. Make a list of how many ways you can physically change a sheet of paper.
2. Take one sheet of paper and physically change it in at least three ways.

Physical Changes Assessment

Benchmark—SC.A. 1.2.1

Circle the correct answer.

1. Which of the following describes a physical change?
 - A. A change in the appearance of the object but not the properties.
 - B. A change in the properties of the object but not the appearance.
 - C. The appearance and the properties do not change.
 - D. The properties change and something new is formed.

2. Which of the following is a physical change?
 - A. burning paper
 - B. mixing baking soda and vinegar
 - C. adding warm water to yeast
 - D. crumpling paper

Define and explain a physical change? Write the answer in your science journal.

Science Strand A

Chemical Change

Benchmark SC.A. 1.2.5 The student knows that materials made by chemically combining two or more substances may have properties that differ from the original materials.

Task: Understand the characteristics of a chemical change.

Materials:

One 5oz. paper cup per one or two students
One teaspoon of baking soda
Two teaspoons of vinegar
goggles

Procedure:

1. Observe the baking soda. Write a description of its properties.
2. Observe the vinegar. Write a description of its properties in your science journal.
3. Put on the goggles
4. Pour two teaspoons of vinegar into a cup
5. Slowly add 1 teaspoon of baking soda

Observe the reaction. Write a description of the change that occurred in your science journal.

Chemical Change Assessment

Benchmark—SC.A. 1.2.5

Circle the correct answer.

1. Which of the following describes a chemical change?
 - A. When a chemical change occurs only the appearance of the substance changes.
 - B. When a chemical change occurs only the properties of the substance changes.
 - C. When a chemical change occurs a new substance is formed.
 - D. When water is added to flour a chemical change occurs.
2. What is the difference between a chemical and a physical change?
 - A. A chemical and a physical change are the same.
 - B. A chemical and a physical change create new substances.
 - C. A chemical change does not create a new substance but a physical change does.
 - D. A chemical change creates a new substance and a physical change does not.

3. Give three examples of chemical changes that occur daily.

Write what you learned about chemical changes in your science journal.

Science Strand A

Magnification

Benchmark SC.A. 2.2.1 The student knows that materials may be made of parts too small to be seen without magnification.

Task: Determine the components of soil.

Materials:

- One microscope
- One cup of soil
- One petri dish or small plastic lid



Procedure:

1. Observe the soil with just your eyes. Draw a picture of what you see in your science journal.
2. Predict what is in soil. Write your prediction in your science journal.
3. Place 1 teaspoon of soil in the petri dish or small plastic lid.
4. Place the petri dish/lid under the microscope. Draw what you see.
5. Compare and contrast your observations. What did you see under the microscope that you did not see with just your eyes? Write the answer to this question in your science journal.

Magnification Assessment

Benchmark—SC.A. 2.2.1

Circle the correct answer.

1. What best explains what happens to objects when placed under a microscope?
 - A. Some small objects look bigger.
 - B. Some small objects look smaller.
 - C. Things that you could not see with your eyes are invisible.
 - D. Things that you could not see with your eyes are visible.

2. John bought a bag of potting soil. What might he observe when the soil is magnified?
 - A. plastic
 - B. yarn
 - C. crystals
 - D. paper

Write a conclusion about this experiment in your science journal.

Answer Key

4th Grade Science Centers

Strand A- Nature of Matter

Volume and Density (SC.A. 1.2.1)

1. A
2. B

Changes in the States of Matter (SC.A. 1.2.2)

1. B
2. A

Physical Changes (SC.A. 1.2.4)

1. A
2. D

Chemical Changes (SC.A. 1.2.5)

1. C
2. D

Magnification (SC.A. 2.2.1)

1. D
2. C