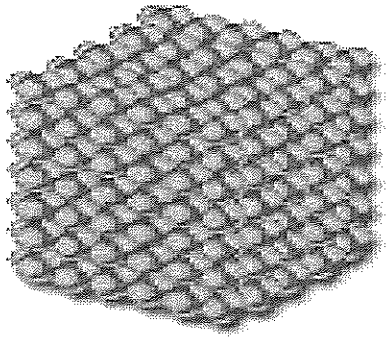
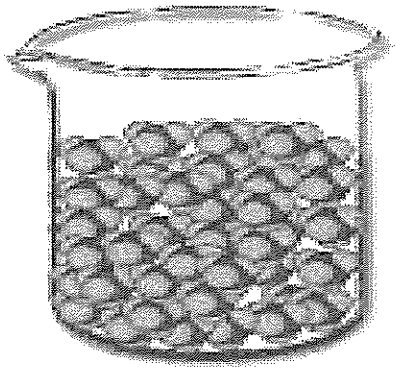
Chapter 10: Matter & Its Properties

States of Matter



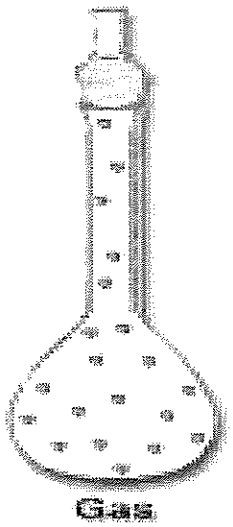
Solid

-Has its own shape
-Has definite volume



Liquid

-No shape of its own
-Has definite volume



Gas

-No shape of its own
-No definite volume
(Air expands to fill the space)

The Chapter 10 test is scheduled for _____.
Review the study guide on packet page 1, packet pages 8, 9, 10, and book pages 294-295 to prepare for the test.

Name _____ Section ____

Name _____ Test Date _____

Chapter 10: Matter and Its Properties ---Study Guide

These items can be found in your child's packet in the science section or in their science book. All items have been discussed at length in class. Please refer to the cover of the packet to view which packet pages to study.

Words to Know:

matter	periodic table	mass	volume	density
property	pressure	element	atom	buoyancy

***Here is a link to help your child to study the vocabulary for Chapter 10.**

http://quizlet.com/1022501/scott-foresman-science-grade-3-chapter-10-flash-cards/

(This link and other links are posted on your science teacher's website.)

Ideas to Know:

- **Matter** is anything that takes up space and has mass.
- Three states of matter are **solids, liquids, and gases**.
- An object's physical **properties** include its size, shape, texture, smell, taste, and color.
- **Solids** have particles that are packed together firmly and connected. Solids **have** a definite shape and volume.
- **Liquids** have particles that are loosely connected and flow past one another. A liquid does **not** have a definite shape. It takes the shape of its container. Liquids **do** have a definite volume.
- **Gas** particles bounce off one another as they move freely. Gases have **no** definite shape or volume. A gas expands to fill all of the available space.
- The elements on a **periodic table** are organized by their individual properties.
- An **atom** is the smallest particle of an element that has properties of that element.
- **Mass** is the amount of matter an object has. Mass is measured with a balance scale. An object's mass is the same **EVERYWHERE**, but its weight may be different.
- If an object sinks in the water, it has little **buoyancy.** The object has more **density** than the water.
- **A km (1,000 m)** can be used to measure longer distances (from one place to another) –similar to a mile in customary units.
- **Volume** can be determined by measuring the amount of space an object occupies.
- **Volume** can be measured using a graduated cylinder or measuring cup. To find the volume of a box, you can see how many cubes of a certain size can fit inside the box.
- Scientists measure an object's **length** by using a ruler with **centimeters (cm)** or a **meter (m)** stick.
- **Volume** of a liquid is measured in **milliliters (mL) or liters (L)** by scientists.
- An object's **mass** is measured by using a balance scale. Scientists use **grams (g)** or **kilograms (kg)** when measuring mass.
- American scientists and doctors use the metric system instead of customary units because:
    - Scientists and doctors around the world use the metric system. This allows for a common language that everyone can understand
    - It is easier to use the metric system since the units are based on a system of 10 instead of random numbers like customary units.

Explore: Which material has a surprising property?

Record your observations in words or a diagram.

	Observation: Pencil Through One Side of Bag	**Prediction: Pencil Through Both Sides of Bag**	**Observation: Pencil Through Both Sides of Bag**
First pencil			
Second pencil			
Third pencil			

Explain Your Results

Compare your **observation** with your **prediction.**

_____

_____

Name _____

Investigate: How can you measure some physical properties of matter?

❶–❺ Fill in the chart below with the measurements you take.

Object	Length (cm)	Width (cm)	Height (cm)	Mass (g)
notepad				
wood block				
small box				
number cube				
sponge				

Explain Your Results

1. **Interpret Data:** Which object has the most mass? Which has the least mass?

_____

_____

2. Were your **measurements** the same as those of other groups?

_____

When you repeated your measurements, were they the same?

_____

Why do you think the measurements might be different?

_____

_____

Cause and Effect

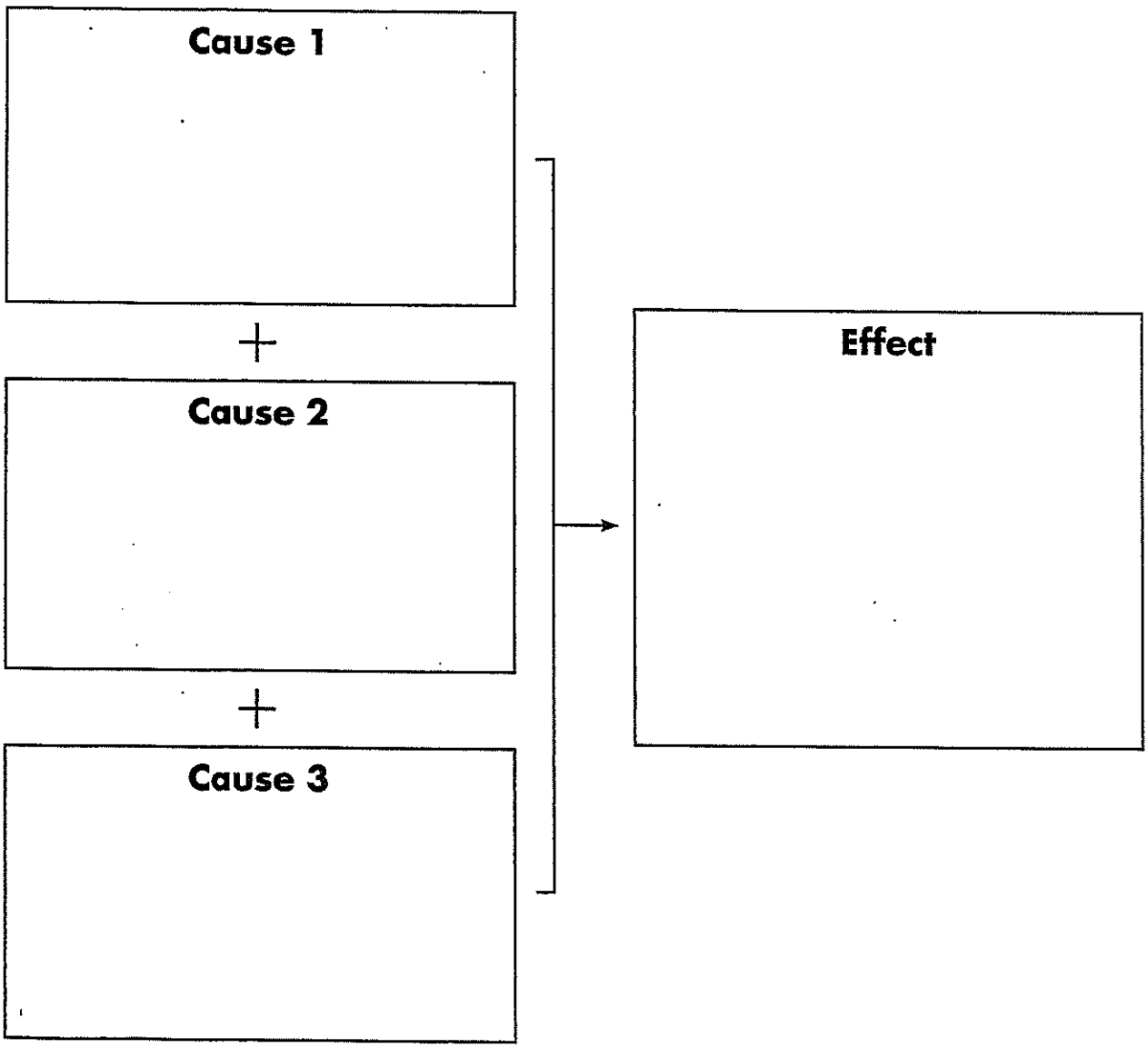
Read the science article.

How Ice Cream Melts

A solid can change into a liquid. For example, on a hot day ice cream melts quickly. What causes this to happen? The ice cream absorbs heat energy from the sun. This adds energy to the tiny particles of which the ice cream is made. Then the particles can move around more freely. As a result, the solid ice cream becomes a liquid that can be poured.

Apply It!

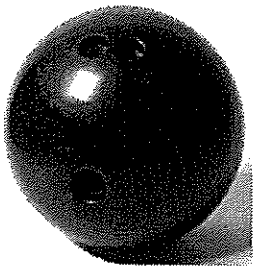
Fill in the graphic organizer. Write three causes and an effect from the article.

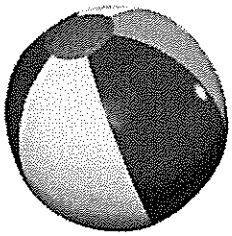


Notes for Home: Your child learned how to identify causes and effects.
Home Activity: With your child, name various things that can change from a solid to a liquid by adding heat. (Some examples include ice, chocolate, iron, and gold.)

Name _____ Section _____

Density is how tightly an object's atoms are packed together.





A bowling ball has more density than a beach ball because the atoms in the bowling ball are packed closer together than the particles in the beach ball.

Make a prediction. Your teacher will pour the following liquids into a clear container. Write each liquid in a space provided. The liquid with the greatest density will be on the bottom, and the least dense liquid will be on the top.

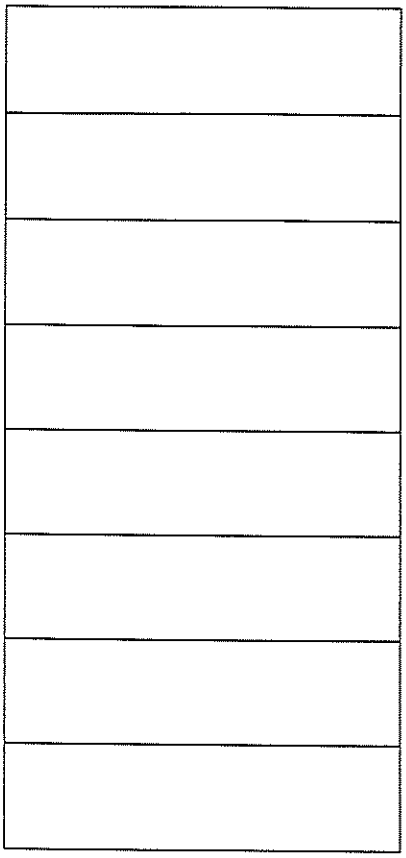
dish soap	rubbing alcohol	corn syrup	honey
water	lamp oil	vegetable oil	maple syrup

After pouring the liquids into the clear container, your teacher will drop the following items into the container. Draw and label each item on the diagram to show where you think each object will land.

screw	**bead**	**ping pong ball**
die	**soda cap**	**popcorn kernel**

Refer to the model to draw your results. Label and color the liquids, then draw and label the items.

Liquids:			
dish soap	rubbing alcohol	corn syrup	honey
water	lamp oil	vegetable oil	maple syrup



Objects:		
screw	bead	ping pong ball
die	soda cap	popcorn kernel

Analyze your data.

1. Which liquid has the greatest density? _____

2. Which liquid has the least density? _____

3. Which liquids have a greater density than water? _____

_____

4. Which object has the most density? _____

5. Which object has the least density? _____

Name _____

Vocabulary Preview

Use with Chapter 10.

Circle the letter of the answer that best tells what the boldfaced word means.

1. Everything around you is made of **matter**—even the air.
   A. simple things
   B. anything that has mass and takes up space
2. Use your senses to discover the **properties** of a thing.
   A. true statements B. qualities you can observe
3. As you blow up a balloon, air inside it has more and more **pressure.**
   A. pushing force B. volume
4. The smallest particles of an **element** keep all the properties of the element.
   A. tiny piece
   B. substance made of one kind of particle
5. Gold is made up only of **atoms** of gold, but one **atom** of gold would be far too small to see.
   A. smallest unit of an element
   B. smallest particle possible
6. Every element has its place on the **periodic table.**
   A. list of matter B. orderly arrangement of elements
7. You can measure an object's **mass** with a scale or a balance.
   A. amount of matter B. size
8. When you measure milk for a cake, you measure its **volume.**
   A. weight B. space taken up
9. Two balls of the same size that weigh different amounts have a different **density.**
   A. volume B. amount of matter per unit of space
10. A plastic lid has more **buoyancy** than a rock.
    A. ability to float B. ability to sink

Notes for Home: Your child learned the vocabulary terms for Chapter 10.
Home Activity: Have your child use pictures and other graphics in Chapter 10 to explain the meanings of the vocabulary words.

Name _____

Use with pages 279–283.

Reviewing Terms: Matching

Match each description with the correct word or phrase. Write the letter on the line next to each description.

_____ 1. anything that takes up space and has weight

_____ 2. something you can observe about matter

_____ 3. pushing by particles in matter

_____ 4. matter made of a single type of particle

_____ 5. the smallest particle of an element that has the properties of the element

_____ 6. a way of arranging elements based on their properties

a. property
b. periodic table
c. pressure
d. element
e. atom
f. matter

Reviewing Concepts: Sentence Completion

Complete the sentence with the correct word.

_____ 7. Matter that is a _____ does not change its shape. (solid, gas)

_____ 8. A _____ expands and fills all the space available. (gas, liquid)

Writing

Use complete sentences to answer question 9. (2 points)

9. Describe one of the states of matter. Then give one example of something you use every day that is found in that state of matter.

_____

_____

Name _____

Use with pages 284–289.

Reviewing Terms: Sentence Completion

Complete each sentence with the correct word.

_____ 1. The amount of matter in an object is its _____. (mass, volume)

_____ 2. An object's _____ is the amount of space the object takes up. (density, volume)

_____ 3. _____ is the amount of matter in a certain amount of space. (Mass, Density)

_____ 4. _____ is the property of matter that describes how well an object floats. (Buoyancy, Volume)

Reviewing Concepts: True or False

Write **T** (True) or **F** (False) on the line before each statement.

_____ 5. Volume is measured using a balance.

_____ 6. To compare the density of two solid objects, you need to know their masses and their volumes.

_____ 7. Metric rulers are used to measure length.

_____ 8. Magnifying glasses and hand lenses are used to observe very small objects.

Applying Strategies: Cause and Effect

Use complete sentences to answer question 9. (2 points)

9. What is the effect of placing an object with a greater density than water in a bucket of water?

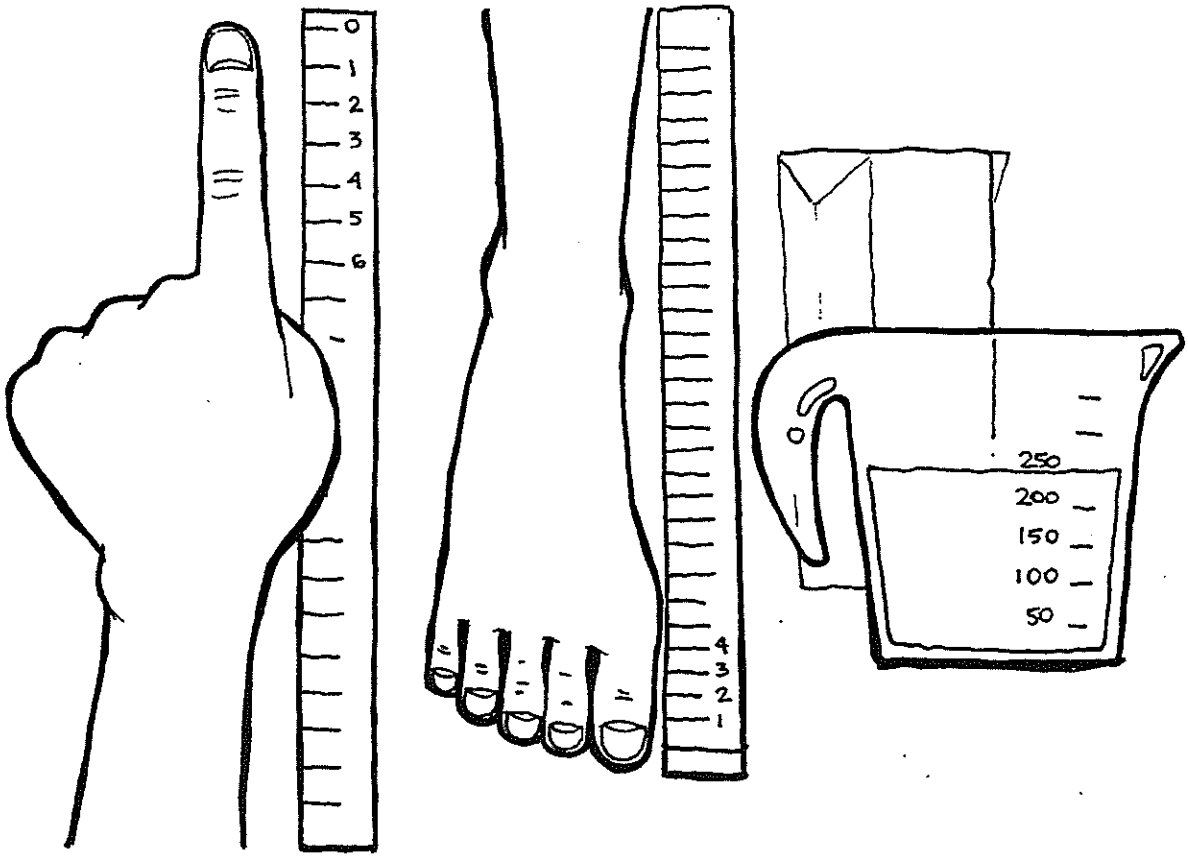
_____

_____

_____

Measuring and Comparing Properties

Use the pictures to answer the questions.



A B C

1. What property is being measured in drawings A and B?

   _____

2. How much longer is the finger than the toe?

   _____

3. What property is being measured in drawing C?

   _____

4. How will this property change if the milk is poured into a glass? _____

Notes for Home: Your child learned about measuring length and volume and comparing measurements.
Home Activity: Put water in a measuring cup and line up different-sized glasses. Have your child predict which ones will hold all the water. Check the predictions.

Vocabulary Word Scramble

To complete each sentence below, unscramble the letters to find the vocabulary word.

Vocabulary Words

matter	property	pressure	element
atom	periodic table	mass	volume
density	buoyancy		

1. A book has more ***nsdyite*** _____ than a bubble.
2. Nothing is smaller than an ***toma*** _____
3. The smoothness of a banana peel is a ***erprytop*** _____ of the banana you feel.
4. A balloon has ***uybaycon*** _____ because it floats on water.
5. A pencil is ***tamret*** _____ that takes up space and has weight.

Continue the game from page 2.

6. The ***temenle*** _____ in silver is different than the one in iron.
7. This cup will measure the ***eluvmo*** _____ of tomato juice.
8. How much ***sams*** _____ does your computer have?
9. The teacher showed us a chart of the ***idcorpie ealtb*** _____.
10. A lot of ***esperurs*** _____ made the ball feel hard.

Fun Fact

Can you answer this question: What weighs more, a pound of steel or a pound of feathers?

Answers: 1. density, 2. atom, 3. property, 4. buoyancy, 5. matter, 6. element, 7. volume, 8. mass, 9. periodic table, 10. pressure