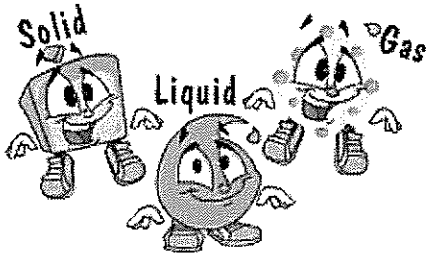
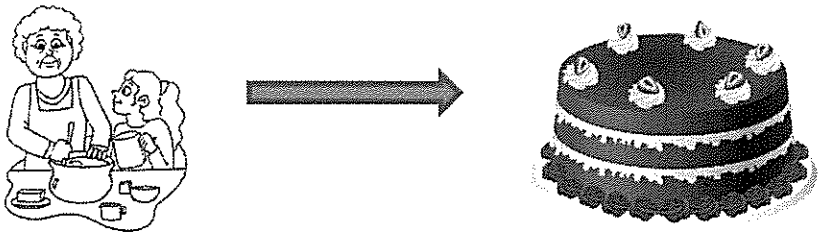
Chapter 11: Changes in Matter

A **physical change** is when matter changes the way it looks without becoming a new kind of matter.



Water (H_2O) can become a solid, liquid, or gas. The phase of the matter changes, but it is still water (H_2O).

A **chemical change** is when one kind of matter changes into another kind of matter.



eggs, flour, butter, oil

The Chapter 11 test is scheduled for _____.
Review the study guide on packet page 1, packet pages 6, 7, 8, 9, and book pages 318-319 to prepare for the test.

Name _____ Section ____

Name _____ Test Date_____

Chapter 11: Changes in Matter ---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:

physical change chemical change states of matter mixture solution

***Here is a link to help your child to study the vocabulary for Chapter 11.**

http://quizlet.com/1022509/scott-foresman-science-grade-3-chapter-11-flash-cards/

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

Ideas to Know:

- **The states of matter** are solids, liquids, and gases.
- **Physical change** is when the way matter looks is changed, but it does **not** become a new kind of matter.
- Some examples of physical changes include:
  cutting or folding paper, making something out of Play-doh, cutting up food, folding clothes
- **Chemical change** is when one kind of matter changes into a different kind of matter.
- Some examples of chemical changes include:
  baking bread, rust forming, burning paper or wood, soaps used to clean, batteries releasing electricity, burning gasoline in cars
- **Matter can change from one state to another** (from a solid to a liquid to a gas), but this is **NOT** a chemical change. For example, ice melting to a liquid is a physical change because **NO** new matter is formed.
- A **mixture** is made of 2 or more kinds of matter that are placed together. Example: tossed salad, fruit salad
- The types of matter in a mixture do not change into another substance. Each kind of matter can be separated from the other kinds of matter in the mix.
- A **solution** is when a substance dissolves into another substance.
- A saltwater mixture can be separated by boiling the water. The boiling water evaporates into the air to become water vapor (a gas), and the salt is left behind.

Name _____

Explore: How can matter change?

Fill in the chart below with your **observations.**

	Cup A (water, salt)	**Cup B** (ice cube)	**Cup C** (vinegar, baking soda)
Observation Right Away			
Observation After 10 Minutes			

Explain Your Results

Infer: Think about the changes you **observed.** In which cup do you think a different kind of matter formed?

_____

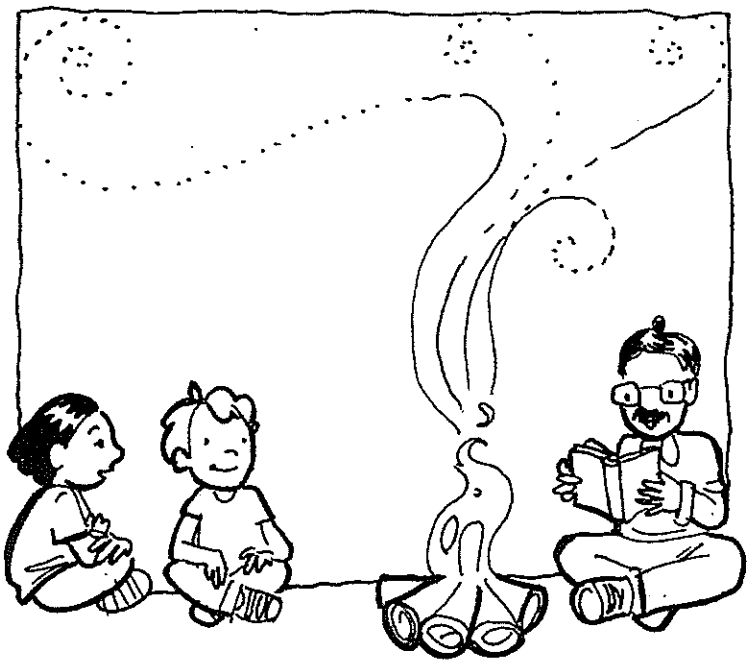
Self-Assessment Checklist	
I followed instructions to complete this activity.	_____
I stayed on task during this activity.	_____
I **observed** the contents of each cup right away.	_____
I **observed** the contents of each cup after 10 minutes.	_____
I **inferred** in which cup a different kind of matter formed.	_____

Notes for Home: Your child observed physical and chemical changes that occurred in different materials.
Home Activity: With your child, combine different materials to determine if there is a physical change or chemical change.

Cause and Effect

Read the science article.

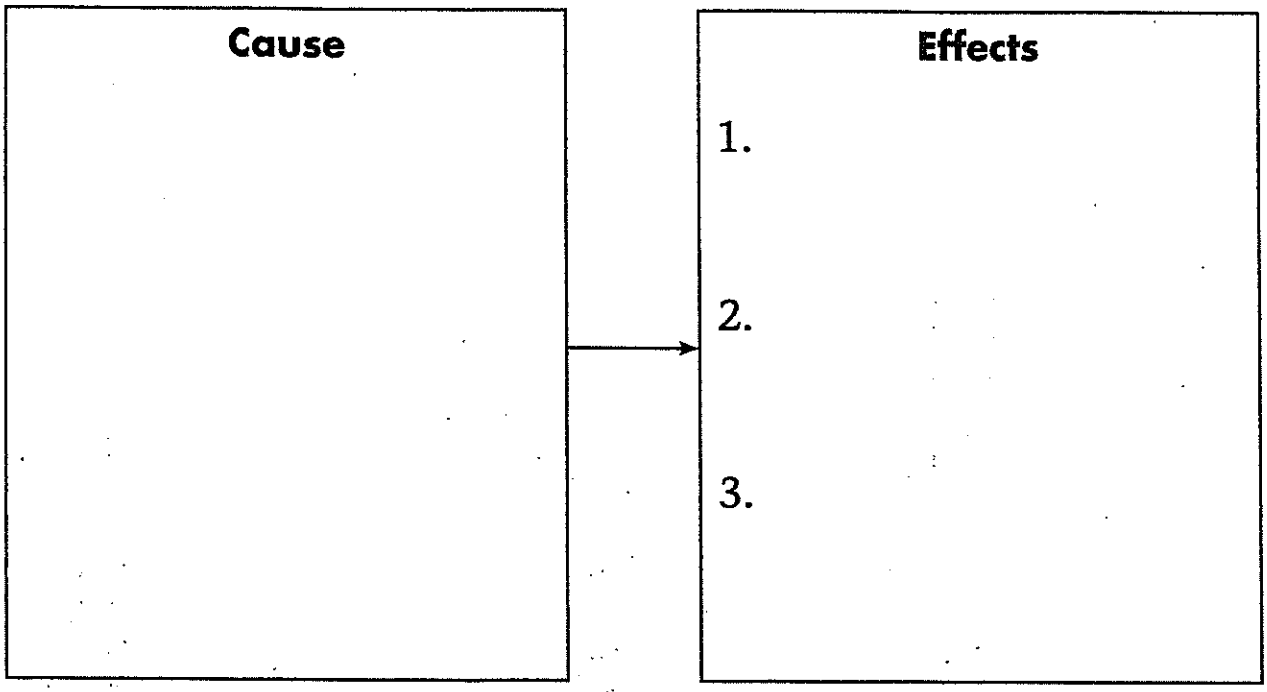
How Wood Burns



What happens to wood when it burns? It gives off heat, of course. It also goes through a chemical change. The wood combines with oxygen and changes to new substances. Some of the wood turns into gases that go into the atmosphere. Much of the wood is changed to ashes. When you put out a campfire, you are looking at a chemical change!

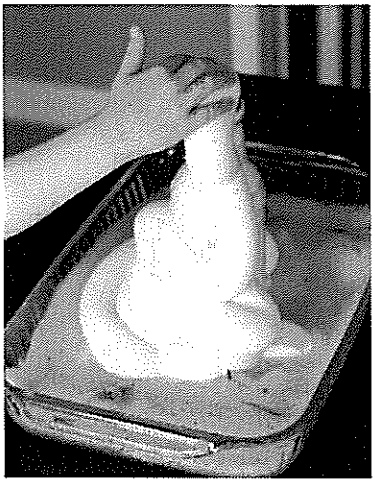
Apply It!

Fill in the graphic organizer. Write a cause and three effects from the article.



Notes for Home: Your child learned how to identify causes and effects.
Home Activity: With your child, safely build and light a small fire in a fireplace, or burn a stick of incense. Observe what happens to the wood or incense.

Elephant Toothpaste



Supplies Needed:

- Dry Active Yeast
- Warm Water
- 6% (20 Volume) Hydrogen Peroxide
- Dawn Dish Soap
- Funnel
- Water Bottle
- Food Coloring
- Glitter (Optional)

Directions:

1. Measure 1 teaspoon of yeast into 2 Tablespoons of very warm water. Mix Well.
2. Add ½ cup of 6% Hydrogen Peroxide to bottle through funnel. (Adult does this step)
3. Add food coloring and glitter (optiona) to bottle. Swirl all together. Add a squirt of soap to the bottle.
4. Place bottle in pan to catch foam.
5. Add yeast mixture through a funnel.
6. Remove funnel.
7. Enjoy!

*It is safe to play with – the reaction breaks down the peroxide so it is completely safe!

Name _____

Vocabulary Preview

Use with Chapter 11.

Write the words in the diagram where they belong. Then add 2 examples for three vocabulary words.

physical change **mixture** **chemical change** **solution**

Changes in Matter

Does not become a new kind of matter in a _____

Does become a new kind of matter in a _____

Examples:
baking cookie dough
making cheese
1. _____
2. _____

Pieces of matter are combined in a _____

Examples:
coins
mixed nuts
1. _____
2. _____

One kind of matter is dissolved in another kind in a _____

Examples:
salt water, soda
1. _____
2. _____

*Remember to add 2 examples!

Notes for Home: Your child learned the vocabulary terms for Chapter 11.
Home Activity: With your child, create chemical and physical changes involving mixtures, such as sand and rocks, lemonade, or cookies. Talk about how each mixture changes.

Name _____

Lesson 1 Review

Use with pages 303–305.

Reviewing Terms: Matching

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

_____ 1. when matter changes the way it looks without becoming a new kind of matter

_____ 2. the forms that matter can take

a. states of matter

b. physical change

Reviewing Concepts: True or False

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

_____ 3. After a physical change there is a new kind of matter.

_____ 4. A change from one state of matter to another is a physical change.

_____ 5. A change in temperature can cause a change of state.

_____ 6. The particles in water move more when it is a solid than they do when it is a liquid.

_____ 7. When water evaporates, it becomes a new kind of matter.

_____ 8. When water freezes, the amount of water stays the same.

Analyzing Strategies: Cause and Effect

Use a complete sentence to answer question 9. (2 points)

9. What is the effect of placing a block of ice in the hot sunshine?

_____

_____

Name _____

Use with pages 306–309.

Reviewing Terms: Sentence Completion

Complete each sentence with the correct word.

_____ 1. Two or more kinds of matter placed together form a _____. (gas, mixture)

_____ 2. A _____ is formed when one substance dissolves in another. (solution, solid)

Reviewing Concepts: Sentence Completion

Complete the sentence with the correct word or phrase.

_____ 3. A pile of pennies, nickels, and dimes is a _____. (mixture, solution)

_____ 4. When a mixture is formed, each kind of matter _____. (changes, stays the same)

_____ 5. A mixture of sand and small iron pieces can be separated using a _____. (strainer, magnet)

_____ 6. Salt can be separated out of a salt water solution by _____. (straining, boiling)

_____ 7. Dissolving is a _____. (change in state, physical change)

_____ 8. When salt dissolves in water, the amount of salt _____. (decreases, stays the same)

Applying Strategies: Calculating

9. A mixture was formed with 220 grams of marbles, 52 grams of sand, and 127 grams of iron pieces. What was the total mass of the mixture? Show your work. (2 points)

Name _____

Use with pages 310–313.

Reviewing Terms: Sentence Completion

Complete the sentence with the correct phrase.

_____ 1. A _____ happens when one kind of matter changes into a different kind of matter. (chemical change, physical change)

Reviewing Concepts: Matching

Some changes in matter are chemical changes. Some changes are not. For each change in matter in the left column, choose the correct description in the right column. You can use each answer more than once.

_____ 2. baking cookie dough
_____ 3. slicing a loaf of bread
_____ 4. iron rusting
_____ 5. ice melting
_____ 6. wood burning
_____ 7. paper tearing
_____ 8. water evaporating

a. chemical change
b. not a chemical change

Writing

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

9. Write a paragraph that describes one chemical change that is a part of your everyday life.

Lab zone **Activity**

How can water and vinegar change a penny?

Materials

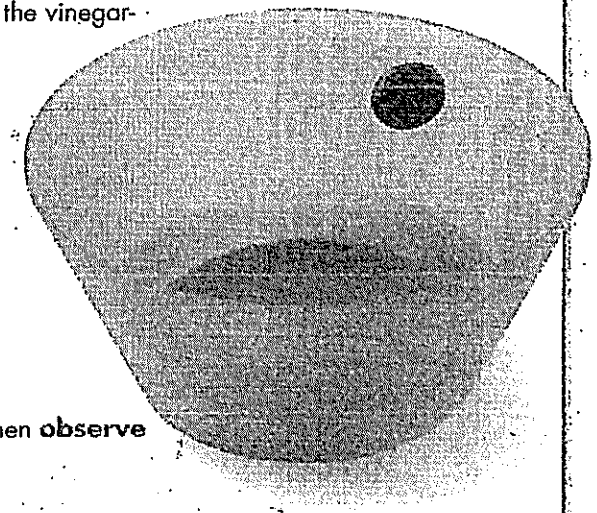
- safety goggles and dirty penny
- metric measuring cup
- plastic container
- vinegar and water
- plastic spoon
- clock or stopwatch

Process Skills

You have to **observe** to find out whether a chemical or a physical change occurred.

What to Do

1. Put on safety goggles. **Measure** 100 mL of vinegar and pour it into the container.
2. Measure 25 mL of water. Pour it into the same container and stir with a spoon.
3. **Communicate** Describe the penny, or draw and color a picture of it.
4. Drop the penny into the vinegar-water solution.



5. Wait five minutes. Then **observe** the penny.
6. Wait another five minutes. Then describe the penny or draw a picture of it.

Explain Your Results

1. What changes did you **observe** in the penny?
2. How do you know this was a chemical change?

Name _____

Activity Flip Chart

Use with Chapter 11

How can water and vinegar change a penny?

❸ **Communicate:** In the box below, describe the penny, or draw and color a picture of it.

❻ In the box below, describe the penny or draw a picture of it after ten minutes in the solution.

Explain Your Results

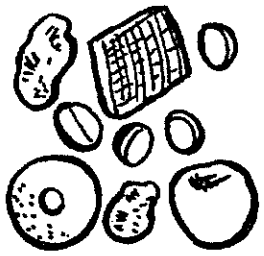
1. What changes did you **observe** in the penny?

2. How do you know this was a chemical change?

A Closer Look at Mixtures

Use the pictures to answer the questions.

5 cups Wheat Squares cereal
5 cups Oatie Oh's cereal
2 cups dried fruit pieces
2 cups peanuts
1/2 cup butter



Mix ingredients in bowl. Melt butter and pour over mixture. Stir. Place on cookie sheet. Bake at 250 degrees for one hour.

1. What is the total volume of the dried parts of this mixture?

   _____

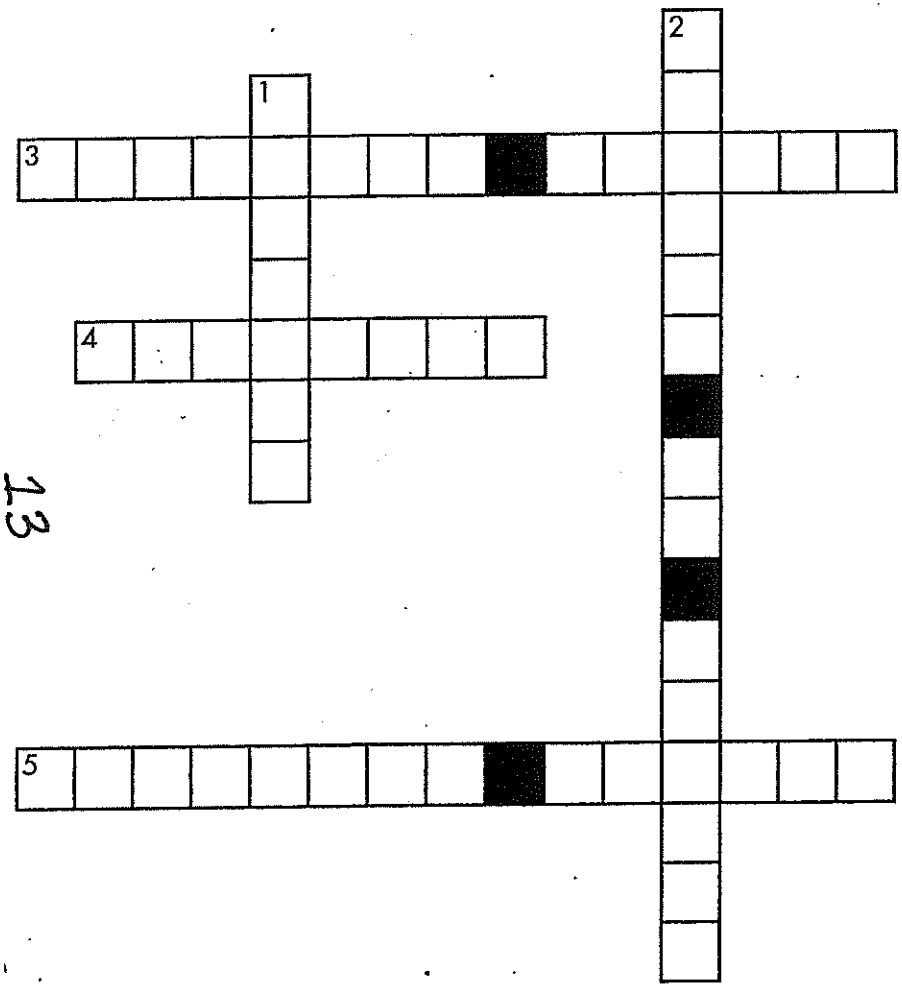
2. How many more cups of cereal are included than cups of fruit and nuts? _____

3. You double the amount of peanuts in the mix. How much more fruit and nuts do you have than Wheat Squares in your mix? _____

Notes for Home: Your child learned about comparing quantity or volume of ingredients in a mixture.
Home Activity: Help your child create a mixture such as fruit salad. Measure the amount of each part of the mixture.

Vocabulary Crossword

Complete the puzzle with the clues you will find on the next page.



Answers: 1. states of change, 2. mixture, 3. physical change, 4. solution, 5. chemical change

Crosssword Clues

Down

1. What you call pieces of rice and vegetables tossed together.
2. What you call liquid when it becomes gas and solid when it becomes liquid.

Across

3. The kind of change that happens when you pull apart sections of an orange.
4. What you have when you dissolve soap in water.
5. What happens to change cookie dough into cookies.

Word Bank

physical change	states of change
mixture	solution
chemical change	