

# BiCarb Balloon

## Lesson 20

**FOCUS** Chemical & Physical change

**OBJECTIVE** To explore how matter can change from one state to another

**OVERVIEW** Matter comes in different forms called "states". But sometimes matter changes from one state to another. Common changes in state are caused by chemical or physical actions.



### WHAT TO DO

With your team, carefully follow each step below.



#### Observe

**Look** at the baking soda. **Look** at the salt. **Look** at the vinegar. **Think** about what common state of matter (solid, liquid, gas) best describes each item.



#### Describe

**Describe** the baking soda, salt, and vinegar. What does each one **look** like? What does each one **feel** like? What does each one **smell** like?



#### Discuss

What state of matter best describes salt?

solid

What state of matter best describes vinegar?

liquid

What state of matter best describes air?

gas



## READ THE STORY

**Matter** comes in different states (solid, liquid, gas). But sometimes matter can change from one state to another. Read the story below to find out more.

## Changes in Matter

**Matter may change from one state to another.**

A solid may turn into a liquid. A liquid may turn into a gas. Such changes happen all the time. Common changes in state are caused by chemical or physical actions.



**This is a chemical change.**

**A chemical action may change matter.**

There are many kinds of chemical actions like rotting, rusting, and burning. These actions make different substances.

For instance, mixing baking soda (sodium bicarbonate) with vinegar (acetic acid) creates carbon dioxide ( $\text{CO}_2$ ). The *solid* and the *liquid* combine to make a *gas*.



**This is a physical change.**

**A physical action may change matter.**

There are many kinds of physical actions like cutting, melting, freezing, or boiling. These can make matter change states.

**Boiling can create physical change.**

Heating water makes it boil. When water boils, it turns into a type of gas (steam). The matter changes from liquid to gas.



**Changes happen all the time.**

**Changes in matter can be natural.**

Unprotected iron rusts over time (chemical change). Cold weather can turn liquid water to solid ice (physical change).

**Changes can also be caused by people.**

Scientists combine chemicals and other ingredients to create many useful items — from plastic spoons to airplane parts!

## WHAT I LEARNED - part 1

Discuss the story with your team, then answer the questions below.



Name two types of change that may affect matter's state.

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How are freezing and boiling similar? How are they different?

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What are some ways you could change the state of water?

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## DO THE ACTIVITY

Working with your research team, carefully follow each step below. Before you start, be sure you know the **safety rules** for this activity.

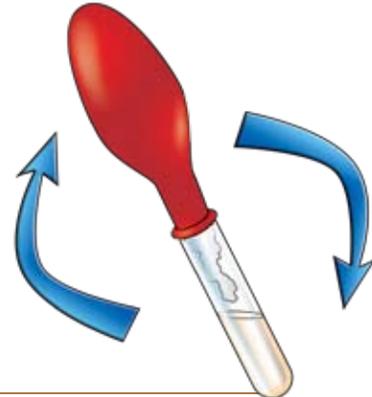


STEP  
1



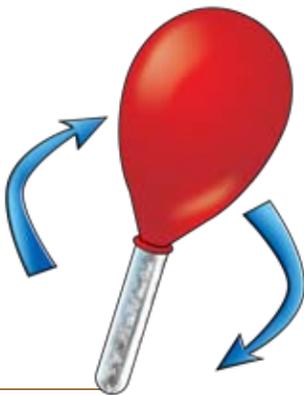
**Examine** the salt, baking soda, and vinegar. **Discuss** which state of matter (solid, liquid, or gas) best describes each item. **Pour** a little salt into one balloon.

STEP  
2



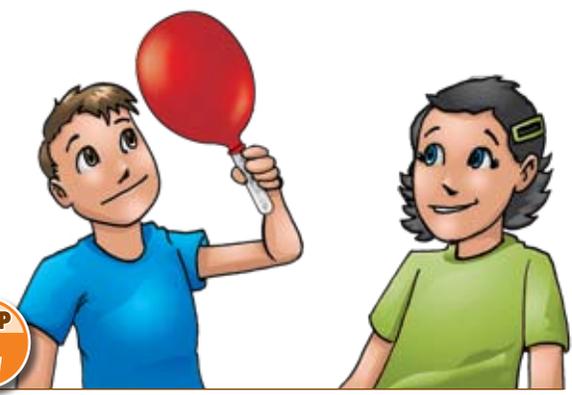
**Pour** an inch of vinegar into the tube. **Attach** the balloon to the top of the tube. Now quickly **tip** the balloon so the salt falls in the tube. **Observe** what happens.

STEP  
3



**Empty** the tube and **rinse** with clean water. Now **pour** a little baking soda in the other balloon. **Repeat** step 2. Carefully **observe** what happens.

STEP  
4



**Compare** steps 2 and 3. **Discuss** what states of matter were shown in each step. **Compare** your observations with those of other research teams.

## WHAT I LEARNED - part 2

Discuss the activity with your team, then answer the questions below.



What states of matter were demonstrated? How?

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How were steps 2 and 3 similar? How were they different?

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How might baking soda help bread dough rise?

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### SHOW WHAT YOU KNOW - 1

Circle any **physical** change in red. Circle any **chemical** change in blue. Write the word that best describes the change on the lines below.

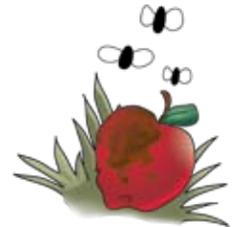
These changes are

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These changes are

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#### To the Parent . . .

#### Scripture Connection: I Corinthians 15:52

**Lesson Focus:**

Chemical and Physical Change

**Lesson Objective:**

To explore how matter can change from one state to another

**National Science Education Standards:**

Standard B1 — “All students should understand that materials have observable (and measurable) properties . . . Materials exist in different states . . . some materials can be changed from one state to another . . .”

**Follow-up Questions:**

Ask your child to name the three most common states of matter on Earth (solid, liquid, gas).

Ask your child to describe a physical change in matter, then give an example (water turns to ice, water turns to steam, etc.).

Ask your child to describe a chemical change in matter, then give an example (baking soda and vinegar make a gas, etc.).