

Change Detectives

Use observations to tell whether matter changed physically or chemically.

S5P1 "Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the sentences that explain how to decide whether a change is physical or chemical. Circle words or phrases that name observations scientists can use as evidence.

Looking Closely at Changes

- ① Matter can change in more than one way. In a physical change, the material stays the same, even though its size, shape, or state may change. Ice turning into liquid water and a sheet of aluminum being folded are physical changes. The water is still H₂O, and the aluminum is still aluminum. Many physical changes can be reversed.
- ② A chemical change forms one or more new substances with different properties. When vinegar and baking soda react, bubbles of carbon dioxide form. A color change, gas, new odor, heat, or light can be evidence of a chemical change. One clue alone is not always enough. Scientists compare several observations and ask whether a new substance formed.
- ③ To evaluate a change, record what you observe before and after it happens. You might note temperature, color, state, odor, bubbles, or whether the material can return to its earlier form. Then use evidence to make a claim. For example, an observation of melted wax shows a state change, but more evidence is needed before claiming a new substance formed. Clear communication names the evidence and explains the claim.

2 ANSWER WITH EVIDENCE Use the passage

1 What is the main difference between a physical change and a chemical change?

2 Name three observations a scientist might record before and after a change.

3 A material changes color, but no other observation is recorded. Can color alone prove that a chemical change happened? Explain.

4 What should a clear explanation of a change include?

3 YOUR TURN Your own words

Choose a change that is not named in the passage. In 2 or 3 sentences, state whether it is a physical or chemical change, name two observations or facts that support your claim, and explain whether a new substance formed.

PART 1 • READ AND MARK

Underline the sentences that explain how to decide whether a change is physical or chemical. Circle words or phrases that name observations scientists can use as evidence. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What is the main difference between a physical change and a chemical change?	A physical change keeps the material the same. A chemical change forms one or more new substances with different properties.
2	Name three observations a scientist might record before and after a change.	Answers include temperature, color, state, odor, bubbles, and whether the material can return to its earlier form.
3	A material changes color, but no other observation is recorded. Can color alone prove that a chemical change happened? Explain.	No. A color change can be evidence, but one clue alone is not always enough. Scientists should compare several observations and determine whether a new substance formed.
4	What should a clear explanation of a change include?	It should name the evidence and explain the claim about the change.

PART 3 • YOUR TURN (SAMPLE ANSWER)

A nail left outside can rust. This is a chemical change because the nail becomes reddish-brown and forms rust with different properties from iron. A new substance forms, so it is not only a change in shape or state.

Accept equivalent descriptions of physical changes and chemical changes when students use accurate evidence. For the open response, accept varied examples if the classification, evidence, and statement about a new substance are scientifically accurate.