



LESSON PLAN

Subject: Grade 8 Science

Lesson: True Colors

Standard Addressed:

- Compare physical changes such as size, shape and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate. (NC.8.P.1.3)

Objectives:

- Classify properties of matter as either physical or chemical properties
- Compare physical changes to changes that are a result of chemical reactions
- Understand the effect of heat on properties of matter

Materials Needed:

- Device for showing “*True Colors*” video
- “True Colors” Activity
- (Optional) Ingredients for the cross-curriculum connection

Outline:

- Prior to this lesson students should understand:
 - The difference between physical and chemical properties of matter
 - The difference between physical and chemical changes in matter
 - How heat affects changes in matter
- Look over the first questions of Activity 1 with the students.
- Show the 10 minute video, *True Colors*, https://youtu.be/LcwJ_AkBhNE
- Use the video to review the physical and chemical properties of matter and allow students to work through the first few questions as a class.
- Students will complete the remainder of the activities in small groups or individually.

Take It Further: Allow students to come up with their own questions about the properties of matter based on the video. Have them quiz one another and explain why their classmate’s answers are right or wrong.

Cross-Curriculum Connection: Have students research how to make litmus paper from red cabbage. Make the paper together as a class. After the litmus paper is dry, instruct students to use substances of varying PH to paint color-changing designs onto the paper. Then give the students regular, acrylic paint, and instruct them to add embellishment to their designs. Engage in a class discussion about whether the colors in their artwork are due to physical or chemical properties.



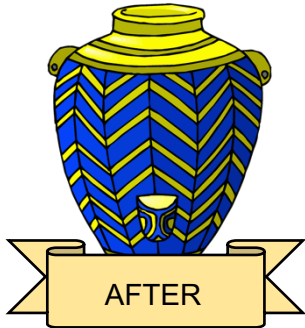
TRUE COLORS

Grade 8 Science

Student Name: _____

Date: _____

Read each question and circle the answers:



Activity 1:

The jar on the left has not been fired yet. We can see that the ingredients of the glaze appear green and brown. Is this a physical property of the ingredients or a chemical property?

Physical

Chemical

The jar on the right has just come out of the kiln. We can see how the heat and oxygen of firing has reacted with the glaze ingredients to change the colors to blue and yellow. Is this due to a physical property of the ingredients or chemical property?

Physical

Chemical

In order for the glaze ingredients to change from chalky to glassy, the pot had to be fired to around 1,800° F. At that temperature, the glaze meets its melting-point and changes states from solid to liquid. Is the melting-point a physical or chemical property?

Physical

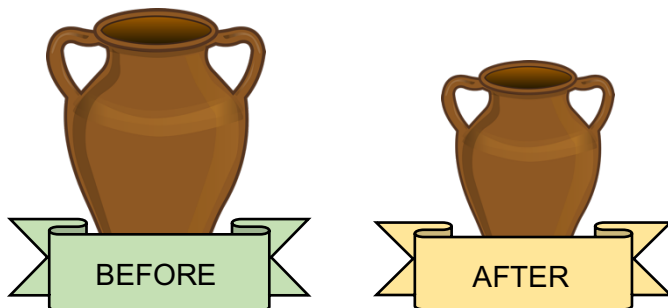
Chemical

TRUE COLORS

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Student Name: _____

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Activity 2:

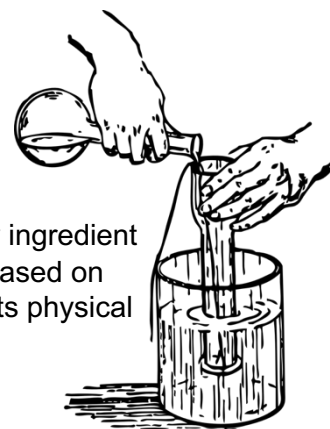
Look at the changes that occurred in the pot above, before and after firing. Which of the choices below are **physical changes** that may have occurred? *Circle all that apply.*

State change	Density change	Color change	Size change	Temperature change
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Activity 3:

In order to mix a glaze that fits the pottery best, the potter must find a glassy ingredient with a melting point of about 1,800° F that will shrink at the same rate as the clay. Based on melting point and change in size, should the potter choose an ingredient based on its physical properties or its chemical properties?



Physical

Chemical

Activity 4:

Sometimes glazes that contain too much Manganese can bubble in the heat of the fire and cause bumpy, sharp blisters all over the surface of a pot. Which **chemical change** of Manganese could be causing these bubbles to form in the heat? *Circle one.*

Change in color	Density change	Formation of a precipitate	Change in state of matter	Formation of a gas
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TRUE COLORS

Grade 8 Science

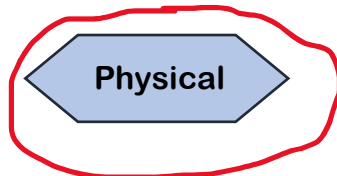
ANSWER KEY

Read each question and circle the answers:

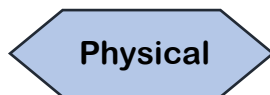


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