

Chemical Change

Lesson Concept When one substance interacts with another substance, a chemical change may occur. There are five indicators that a chemical change has occurred: gas production (bubbles), color change, temperature change, precipitate formation, or light production.

Link Students experienced chemical reactions during the Kitchen Chemistry lesson. The examples of chemical reactions presented here help students understand the indicators of chemical change.

Time Day 1: 70 minutes; Day 2: 45-50 minutes

Materials Whole class
SBCEO portal: Chemistry in Action: Reactions (VL) Segment 1: evidence of chemical reactions
Technology to view video
Demonstration materials for chemical reactions, i.e., 15ml of each powder and liquid listed below:
Baking soda and vinegar
Calcium chloride and water
Red cabbage juice and vinegar
3 quart Ziploc™ bags
Matches or lighter
Stations:
Station #1: iodine and cornstarch in sealed jar or baggie
Station #2: glow stick, any color
Station #3: ripped paper
Station #4: burned paper
Station #5: hot cocoa mix and water in sealed jar
Station #6: cupcake or muffin
Station #7: trail mix in sealed jar
Station #8: popcorn in sealed jar
8 trays (1 for each station)
Labels for each station with letter and substance

Per Group (table groups)

Birthday candle

Modeling clay

Pie plates

Individual

Chemical Lab worksheet

Science Notebook

Advance

Preparation

1. Gather materials.
2. Copy lab papers.
3. Assemble each station tray with materials and labels. Premix any jars.
4. Prepare a tray of materials and chemicals for teacher demonstration.

Procedure:

Engage

(20 minutes) There are five indicators that a chemical change has occurred: gas production (bubbles), color change, temperature change, precipitate formation, or light production.

1. Discuss observations from previous lesson (Kitchen Chemistry) and brainstorm list of chemical change observations i.e., gas production, color change, precipitate production, temperature change, light production, etc. List on the board.
2. Model gas production by combining 15 ml (1 tbsp) baking soda and 15 ml (1 tbsp) vinegar in a baggie and seal. Have students observe the reaction. Discuss outcome.
3. Model color change by combining 15 ml (1 tbsp) iodine and 15 ml (1 tbsp) cornstarch in baggie and seal. Have students observe the reaction. Discuss outcome.
4. Model temperature change by combining 15 ml (1 tbsp) calcium chloride and 15ml (1 tbsp) of water. Allow students to observe the baggie using the sense of touch. Discuss outcome.
5. Review the indicators of a chemical change listed on the board. Ensure that all indicators are listed and students understand that during a chemical change matter (reactants) are rearranged to form new products with new properties. Remind students that in physical change no new products form.
6. Record student ideas on a T-Chart to contrast the indicators of chemical change and physical change. Have students add the T-Chart to their notebook to use as a tool for exploration.

Explore

(50 minutes) There are five indicators that a chemical change has occurred: gas production (bubbles), color change, temperature change, precipitate formation, or light production.

7. Explain to students that they will rotate through 8 stations in small groups. At each station students will record: the name of the substance(s), observation of changes, whether the changes are examples of a chemical change or a physical change, and why.
8. Distribute Chemical Lab worksheet. Have students record their observations on the worksheet.
9. Allow students 3-5 minutes for each station.

Explain ***(30 minutes) During a chemical reaction the atoms in the reactants (matter) rearrange to form products with different properties.***

10. Bring students back to whole group. Facilitate a discussion to help students compare their results with others at their table groups.
11. Discuss students' results, specifically stations where students were in disagreement about whether there was a chemical or physical change. Ask students to give evidence for reasoning.
12. Show video segment from SBCEO portal: Chemistry in Action: Reactions (VL) Segment 1: evidence of chemical reactions
13. Explain that when something interacts with a substance and causes molecules to break apart and rearrange and bond again, a chemical reaction has taken place.

Extend ***(10 minutes) When something interacts with a substance and causes the molecules to break apart, rearrange, and bond again, a chemical change has taken place. There are five indicators that this has happened: gas is produced, change of color, change in temperature, precipitate is formed, and light is produced.***

14. Distribute birthday candles (One per table group). Place birthday candle in a small piece of modeling clay (on top of an aluminum pie plate). Students observe burning candle and note signs of chemical change.

Evaluate ***(5-10 minutes) When something interacts with a substance and causes the molecules to break apart, rearrange, and bond again, a chemical change has taken place. There are five indicators that this has happened: gas is produced, change of color (acids and bases), change in temperature, precipitate is formed, and light is produced.***

15. Distribute exit cards. Ask students, "What is the difference between a physical change and a chemical change?" Ask students to give an example of a physical change and a chemical change.

Name: _____

Chemical Change Lab

Station #	Substances	Observation of changes	Identify chemical or physical change	Why?
1				
2				
3				
4				
5				
6				
7				
8				



Exit Card

Name: _____

Homeroom Teacher: _____

What is the difference between a physical change and a chemical change? _____

Give an example of a physical change: _____

Give an example of a chemical change: _____



Exit Card

Name: _____

Homeroom Teacher: _____

What is the difference between a physical change and a chemical change? _____

Give an example of a physical change: _____

Give an example of a chemical change: _____