



Science Unit | Grades 7-9 | Lesson 3: Craftsmen Chemistry

Lesson Description

No matter where you are Chemistry is not far away. It can be something as simple as cooking an egg or as elaborate as sending rockets into space. Without Chemistry, there would not be any sodas, shampoos, plastics, fuels, and jewelry, just to name a few. Even at Silver Dollar City Chemistry can be discovered in multiple ways. In this activity students will explore some of the arts that use Chemistry around the park. You will discover the differences between chemical and physical changes/reactions as well as some fun tips about each craft you're studying. So grab your partner and get ready for a real-world tour of craftsmen Chemistry!

Concepts

Chemical Reaction
Chemical Change
Physical Change

Physical/Chemical Properties
Malleable
Ductile

Objectives

Students will:

- Be able to differentiate between a physical and chemical change.
- Be able to identify a chemical reaction.
- Learn some of the physical and chemical properties of different crafts.
- Learn specific vocabulary that goes along with certain crafts.

Content Standards

CLE: 1.F.2.a

National Standards in Science

- **Standard 8:** Understands the structure and properties of matter.
 - Benchmark 8, Grades 6-8: Knows that substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties.



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- Benchmark 9, Grades 6-8: Knows factors that influence reaction rates (e.g., types of substances involved, temperature, concentration of reactant molecules, amount of contact between reactant molecules).
- Benchmark 10, Grades 9-12: Understands that chemical reactions either release or consume energy (i.e. some changes of atomic or molecular configuration require an input of energy; others release energy).
- Benchmark 11, Grades 9-12: Knows that chemical reactions can take place at vastly different rates and reaction rates depend on a variety of factors that influence the frequency of collision of reactant molecules (e.g., shape and surface area of the reacting species, temperature, pressure, the presence or absence of a catalyst).
- Benchmark 12, Grades 9-12: Knows that chemical reactions can be accelerated by catalysts (e.g., metallic surfaces, enzymes).
- **Standard 9:** Understands the sources and properties of energy.
 - Benchmark 6, Grades 6-8: Knows that most chemical and nuclear reactions involve a transfer of energy (e.g., heat, light, mechanical motion, electricity).

Time Required

Approximately 60 minutes

Materials

- Student activity sheet (from website)
 - Silver Dollar City Park Map
 - Writing utensil
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Procedures

1. Print off the student activity sheet from the Kids-U-Cation website and hand out to students.
 2. Pick up a park map upon entering Silver Dollar City.
 3. Use the map as you travel from craftsmen to craftsmen to fill out the activity sheet.
 4. Turn into teacher for a completion or accuracy grade.
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Closure

Review the key points of this lesson by discussing the following:

- What is the difference between a chemical and physical change?
- Give another example (one you did not see today) of a Silver Dollar City craftsman that creates physical changes in their crafts everyday.
- What examples of a chemical reaction did you see today?
- What new vocabulary words did you learn?
- Does anyone have an interest in creating these types of crafts as an everyday job?

Assessment/Independent Practice

Give an assignment or test of your choice.



Name/Date: _____

Silver Dollar City: Craftsmen Chemistry

No matter where you are Chemistry is not far away. It can be something as simple as cooking an egg or as elaborate as sending rockets into space. Without Chemistry, there would not be any sodas, shampoos, plastics, fuels, jewelry, etc. Chemistry is the foundation of most products we use on a daily basis. Did you brush your teeth this morning or use hairspray? Chemistry made that possible.

Even at Silver Dollar City chemistry can be discovered in multiple ways. With this lesson we are going to explore some of the crafts that use Chemistry in the park. You will be exploring the differences between chemical and physical changes/reactions. Please make sure you (or your group) have a Silver Dollar City map to find the required destinations.

Instructions:

In this lesson there are four different locations. Visit each of those locations when the artist is available. Answer three questions for each location (artist may be able to help). Definitions are on the last sheet if there is a word that is unfamiliar. Share your findings with other groups and your teacher. Good luck and have fun!

Definitions:

Malleable- capable of being formed by hammer or pressure

Ductile- easily drawn into wire or hammered into thin sheets

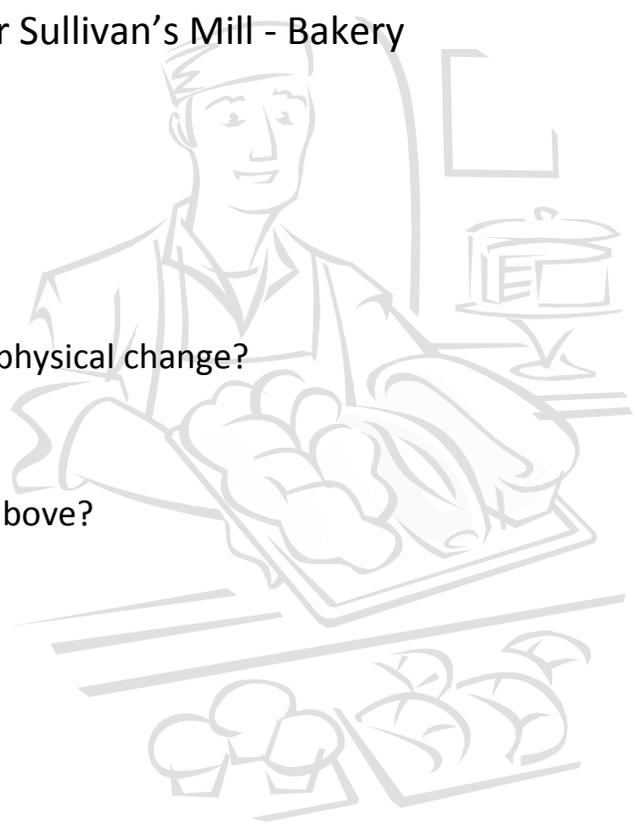
Physical Change- change of physical state of a substance, but chemical makeup remains the same. (Example: ice cube melts and forms liquid water)

Chemical Change- changes that affect the chemical makeup of a substance and creates new substance(s). Signs of a chemical change/reaction are color change, production of light, smoke, bubbling/fizzing, and/or presence of heat. (Example: lighting a match)

1st Destination: Eva & Delilah's Bakery or Sullivan's Mill - Bakery

Questions:

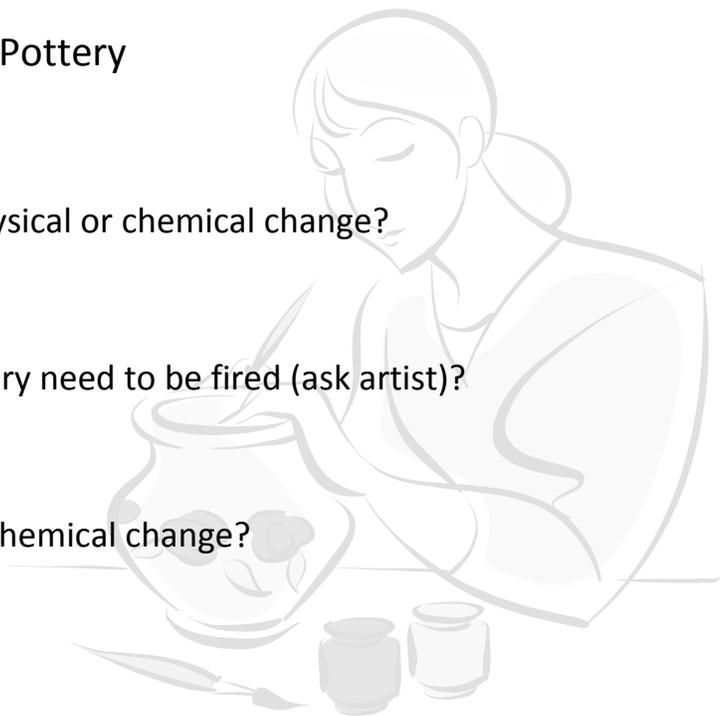
- What makes the dough rise?
- When bread bakes is this a chemical or physical change?
- What is your reasoning for the answer above?



2nd Destination: Hillcreek Pottery - Pottery

Questions:

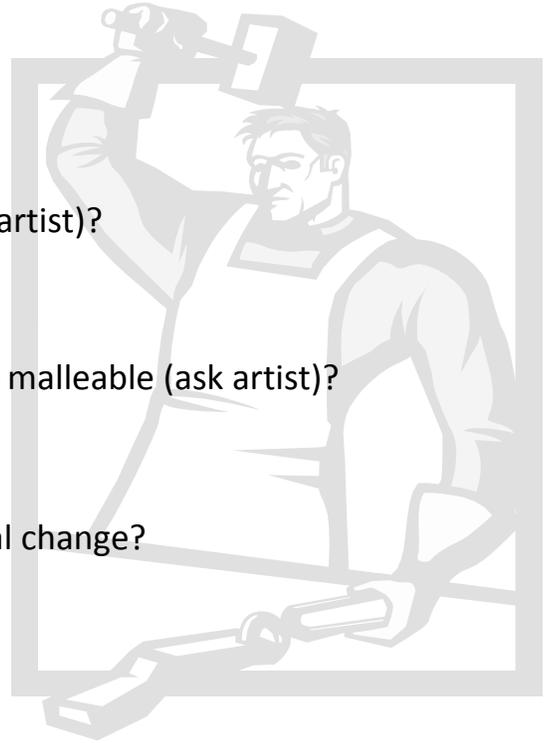
- Is the forming of the pottery a physical or chemical change?
- What temperature does the pottery need to be fired (ask artist)?
- Is firing the pottery a physical or chemical change?



3rd Destination: Mission Metals - Blacksmith

Questions:

- What type of metal is the blacksmith using (ask artist)?
- What temperature is needed to make the metal malleable (ask artist)?
- Is the heating of the metal a chemical or physical change?



4th Destination: Hazel's Blown Glass Factory – Glassblowing

Questions:

- What is the melting point of the type of glass used (ask artist)?
- Is the melting of glass a physical or chemical change?
- Explain the reasoning for your answer to the above question?

