

## LESSON PLAN

**Subject:** Grade 8 Science

**Lesson:** Pewter Casting: All Things Matter

**Standard Addressed:** Understand the properties of matter and changes that occur when matter interacts in an open and closed container. (8.P.1)

**Objectives:**

- Classify matter as elements or compounds.
- Identify melting points of three different elements.
- Identify symbol, atomic number and atomic mass of sample elements.
- Explain how law of conservation of mass is upheld.

**Materials Needed:**

- Device for showing *Pewter Casting: All Things Matter* video.
- Periodic Table (on-line or hard copy)
- “Pewter and Its Elements” activity

**Outline:**

- Prior to this lesson, students should know the difference between elements and compounds. Students should also know how to find the symbol, atomic mass, and atomic number on a periodic table.
- Show the video.
- Discuss the activity prompts, particularly on Question 3.
- Students finish the activity independently or with a partner.

**Take It Further:** Brother Blake used the term “eutectic”. Explain what this means. Determine what pewter’s melting point is. Compare it with the melting points of the elements involved in making pewter.

**Cross-Curriculum Connection:** Pewter is made up of mostly tin but can contain many other elements. Research what other elements have been used in the past to make pewter. Explain what you learn about one of these elements that is harmful to human health.

## Pewter and Its Elements, page 2

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Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

3. Explain how you know a **chemical change** took place in the making of pewter.

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4. Using the vocabulary terms “atoms”, “compound”, “elements”, and “mass”, explain how the video helps exemplify the Law of Conservation of Mass.

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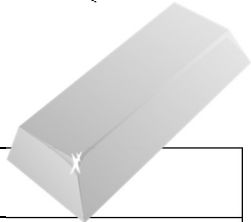
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**BONUS:** Pewter is an alloy. Alloys are combinations of metals and other elements. (The other elements do not have to be metals themselves.)

Research the alloys listed to help you complete this chart.



Alloy	Elements that Make It
Sterling Silver	
Steel	
Brass	
Bronze	
Rose Gold	

## Pewter and Its Elements, page 1

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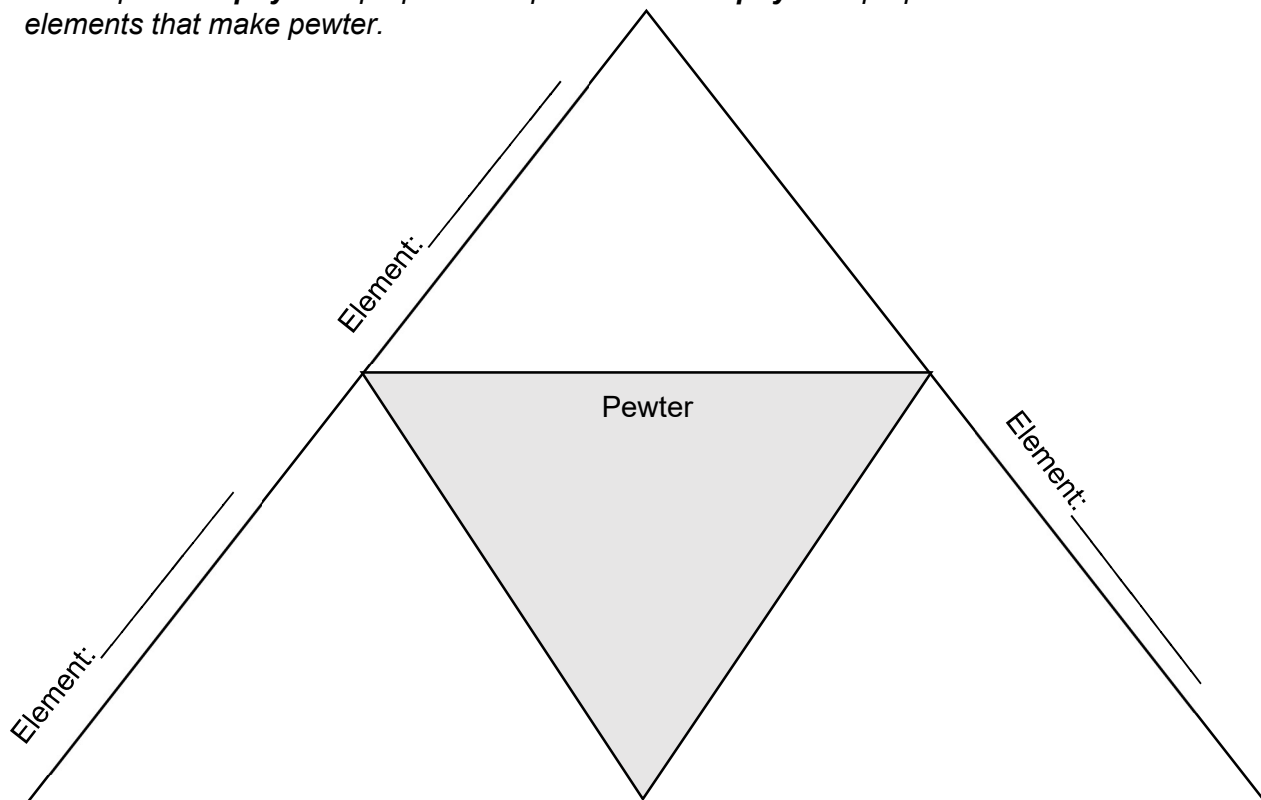
Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

In the video, you saw the three elements that are combined to make the compound pewter.

1. Use a Periodic Table to complete the chart below for the three elements.

Element	Symbol	Atomic Number	Atomic Mass

2. Compare the **physical** properties of pewter with the **physical** properties of the three elements that make pewter.



## Pewter and Its Elements, page 1

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### ANSWER KEY

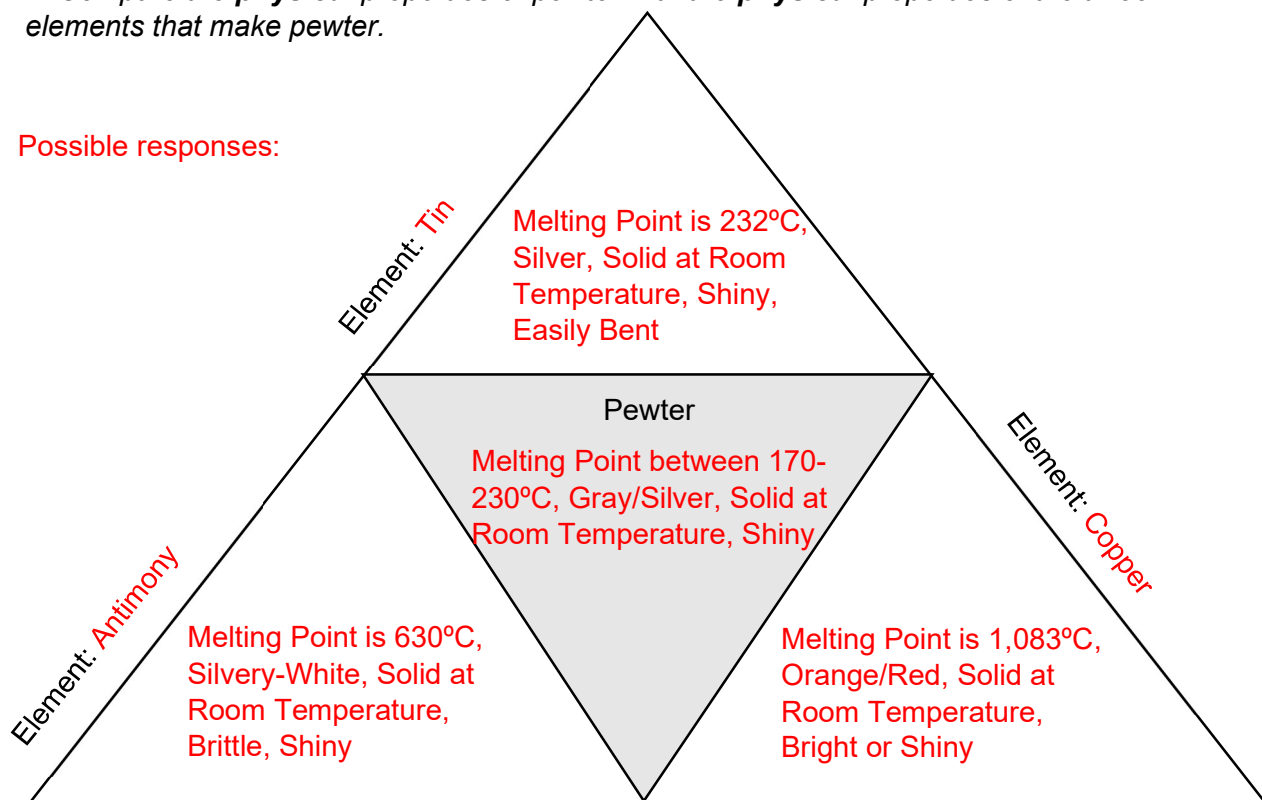
In the video, you saw the three elements that are combined to make the compound pewter.

1. Use a Periodic Table to complete the chart below for the three elements.

Element	Symbol	Atomic Number	Atomic Mass
Tin	Sn	50	118.71
Antimony	Sb	51	121.76
Copper	Cu	29	63.546

2. Compare the **physical** properties of pewter with the **physical** properties of the three elements that make pewter.

Possible responses:



## Pewter and Its Elements, page 2

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### ANSWER KEY

3. Explain how you know a **chemical change** took place in the making of pewter.

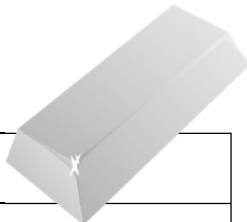
**Answers should be similar to:** "I know a chemical change took place because the color of pewter is different from the colors of tin, antimony, and copper. There was a change of temperature in the making of pewter, so that also helps me know that this was a chemical change. Additionally, it would be impossible to get the elements tin, antimony, and copper back once pewter is made, and this makes this a chemical change."

4. Using the vocabulary terms "atoms", "compound", "elements", and "mass", explain how the video helps exemplify the Law of Conservation of Mass.

**Answers should be similar to:** "In the chemical reaction between tin, copper, and antimony, the compound pewter was formed. The number of atoms in the original elements are the same as the number of atoms in the pewter. Therefore, the total mass of atoms stays the same overall."

**BONUS:** Pewter is an alloy. Alloys are combinations of metals and other elements. (The other elements do not have to be metals themselves.)

Research the alloys listed to help you complete this chart.



Alloy	Elements that Make It
Sterling Silver	Silver and Copper
Steel	Iron and Carbon (Many times includes Manganese)
Brass	Copper and Zinc
Bronze	Copper and Tin (Can also include other elements)
Rose Gold	Gold, Copper, and Silver