

Short Performance Assessment: **MS-ESS3-1**

Grade Level: **Middle School**

Adapted from [SNAP](#)¹

Title	Is your Penny Copper or Zinc		
Designed by	Paul Andersen	Course(s)	Middle School
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Performance Expectation	<p>MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.</p> <p>Clarification Statement: Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock)</p> <p>Assessment Boundary: none</p>
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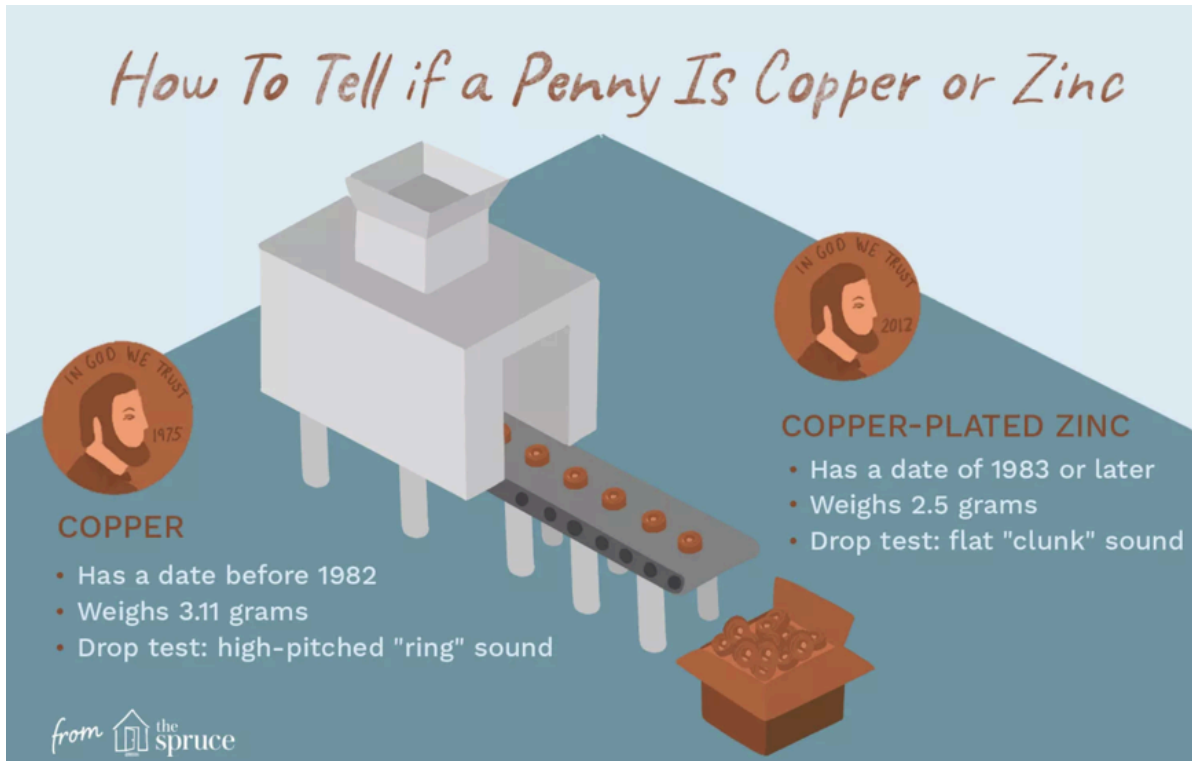
Science and Engineering Practice	<p>Constructing Explanations</p> <ul style="list-style-type: none"> Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
Disciplinary Core Ideas	<p>ESS3.A: Natural Resources</p> <ul style="list-style-type: none"> Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes.
Crosscutting Concept	<p>Cause and Effect</p> <ul style="list-style-type: none"> Cause and effect relationships may be used to predict phenomena in natural or designed systems.

Student Performance	<ol style="list-style-type: none"> Articulating the explanation of phenomena Identifying the scientific evidence to construct the explanation Reasoning
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¹ The Short Performance Assessment (SPA) and the Assessment Rubric adapted from the Stanford NGSS Assessment Project <http://snapgse.stanford.edu/>



Name _____



“If your Lincoln Memorial penny has a date before 1982, it is made of 95% copper. If the date is 1983 or later, it is made of 97.5% zinc and plated with a thin copper coating. For pennies dated 1982, when both copper and zinc cents were made, the safest and best way to determine their composition is to weigh them. Solid copper pennies weigh 3.11 grams (+/- 0.130 g.), whereas the copper plated zinc pennies weigh only 2.5 grams (+/- 0.100 g.).

Back in the early 1970s, the rising price of copper was pushing the cost to make a penny over its face value of one cent. Fortunately, the price of copper dropped and production continued. Unfortunately, the increasing price of copper in the early 1980s forced The United States Mint to change the composition of the penny permanently. This was to prevent a melt off of pennies. It has been the past experience in the United States that when the melt value of a coin exceeds its face value, people will melt the coins in order to sell the raw metal and make a profit.”

<https://www.thesprucecrafts.com/penny-solid-copper-or-plated-768853>

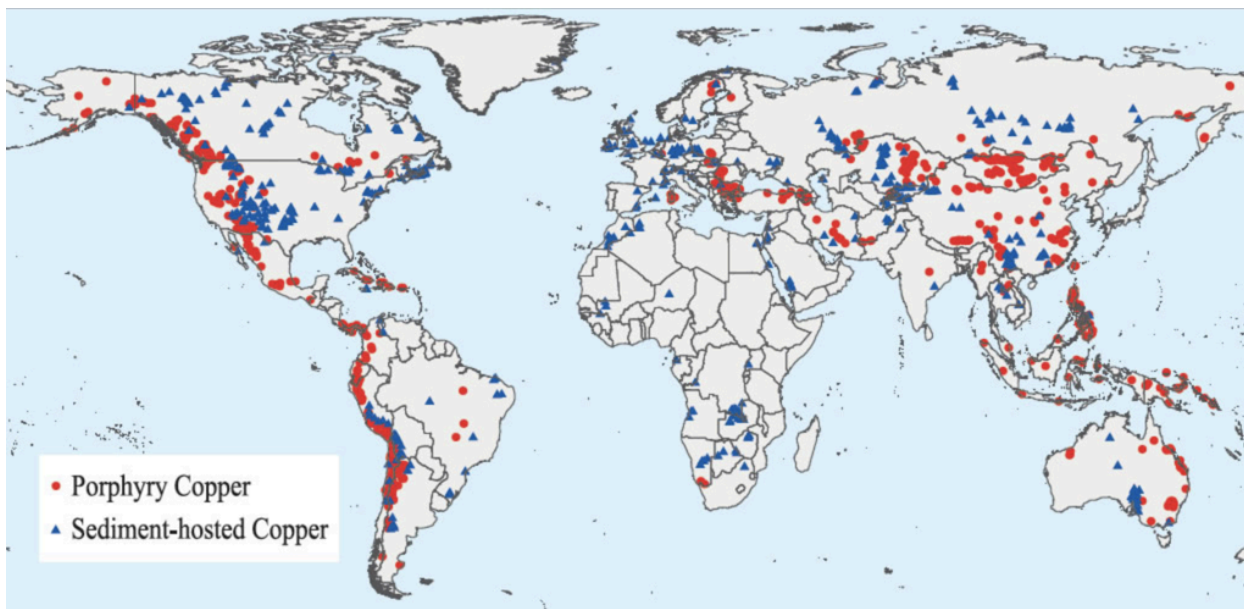
1. Is copper a renewable or nonrenewable resource? Explain.

The following map shows the distribution of copper on the planet.



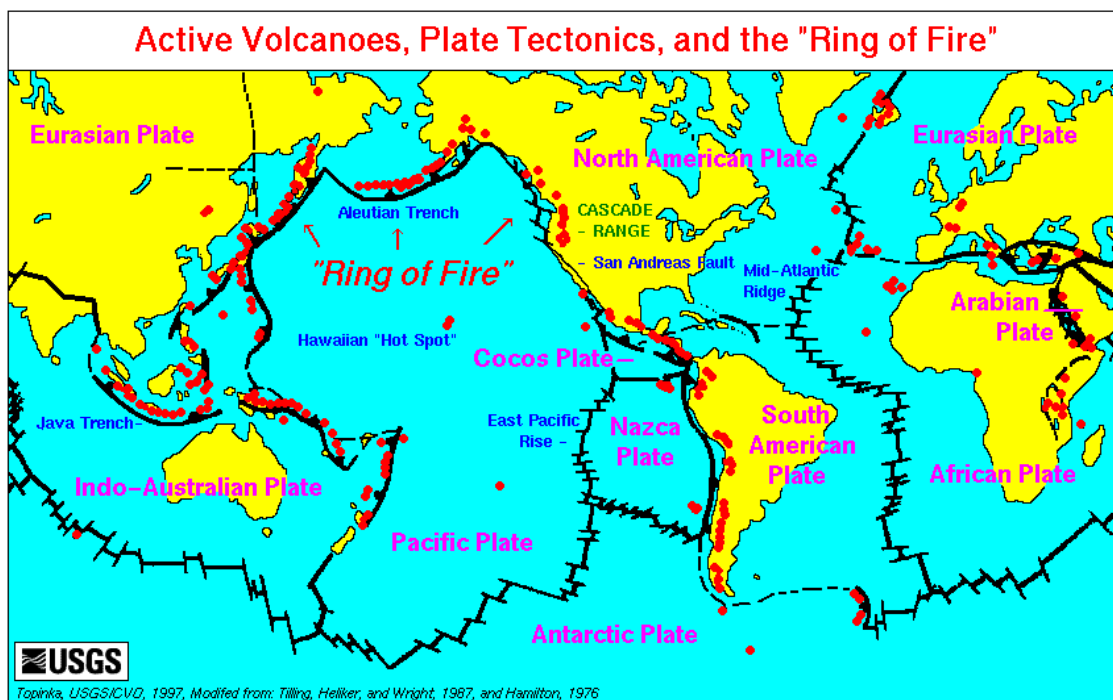
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<https://geology.com/usgs/uses-of-copper/copper-deposits-map-lg.jpg>

The following map shows active volcanoes, plate tectonics and the ring Fire.



https://commons.wikimedia.org/wiki/File:Map_plate_tectonics_world.gif



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2. Construct an explanation with evidence for how the uneven distribution of the Earth's copper deposits are the result of past and current geoscience processes.

- Write a claim for the cause of the uneven distribution of the Earth's copper deposits.
- Support your claim with data from the maps and your knowledge of natural resources and geoscience processes
- Share your reasoning.

CLAIM:

EVIDENCE: (include specific evidence from the maps)

REASONING:



Assessment Rubric* - Question 1

	Emerging	Developing	Approaching Proficiency	Excelling
Description of performance				
Sample student responses				

Assessment Rubric* - Question 2

	Emerging	Developing	Approaching Proficiency	Excelling
Description of performance				
Sample student responses				

Insert additional Assessment Rubrics (if needed) here.

