

Item	Conducts Electricity	Does Not Conduct Electricity
House Key		
Rubber Band		
Coin		
Wooden Toothpick		
Metal Fork		
Plastic Spoon		
Aluminum Foil		

Suppose that you have one of the items from the list that you believe conducts electricity, and that you also have a battery, several wires, and a light bulb.

Explain how you could use these things to do a test to find out if the item you chose from the list does conduct electricity. Draw a picture to help explain your answer.

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## Scoring Guide

Score & Description
<b>Complete</b> Student draws and/or describes how a battery, wires, and a light bulb could be used to test for electrical conductivity.
<b>Partial</b> Student describes some elements of a complete circuit, but does not clearly describe how the circuit could be modified to test for electrical conductivity (e.g., "hook up the wires to the battery and light bulb"), or student draws a partially correct picture or diagram, or draws an incorrect diagram but specifies that the lighting of the bulb would indicate conductivity.
<b>Unsatisfactory/Incorrect</b> Student is unable to describe an electrical circuit or to explain accurately how to test an item for electrical conductivity.

### Complete - Student Response

- 1 Suppose that you have one of the items from the list that you believe conducts electricity, and that you also have a battery, several wires, and a light bulb.

Explain how you could use these things to do a test to find out if the item you chose from the list does conduct electricity. Draw a picture to help explain your answer.



get some wires to connect to the item and if the electricity flows through it and lights the bulb it is a conductor

- 1 Suppose that you have one of the items from the list that you believe conducts electricity, and that you also have a battery, several wires, and a light bulb.

Explain how you could use these things to do a test to find out if the item you chose from the list does conduct electricity. Draw a picture to help explain your answer.

you attach the wires onto the light bulb and then to the battery, then you make a gap between the wires then you place the object there and see if the light bulb lights up.

Scorer Comments:

The first response provides a correct drawing of a complete circuit, and the second response describes a complete circuit. Both responses explain how the circuit can be used to determine the electrical conductivity of an item.

**Partial - Student Response**

- 1 Suppose that you have one of the items from the list that you believe conducts electricity, and that you also have a battery, several wires, and a light bulb.

Explain how you could use these things to do a test to find out if the item you chose from the list does conduct electricity. Draw a picture to help explain your answer.



Run 2 wires from the battery to a coin. Then run a wire from the coin to a light bulb. if it lights up then it conducts electricity

- 1 Suppose that you have one of the items from the list that you believe conducts electricity, and that you also have a battery, several wires, and a light bulb.

Explain how you could use these things to do a test to find out if the item you chose from the list does conduct electricity. Draw a picture to help explain your answer.

Hook the battery and wires together and then hook them to the object. Hook one of the wires to the light bulb and see if it lights up

Scorer Comments:

Neither response is credited for drawing or describing a complete circuit because the first response includes an incorrect diagram of a circuit, and the second response includes an unclear description of a circuit. Both responses receive partial credit for specifying that the lighting of the bulb would determine that an item conducts electricity.

**Unsatisfactory/Incorrect - Student Response**

Suppose that you have one of the items from the list that you believe conducts electricity, and that you also have a battery, several wires, and a light bulb.

Explain how you could use these things to do a test to find out if the item you chose from the list does conduct electricity. Draw a picture to help explain your answer.



You put a wire to the light Bulb and hook it to the battery the connect the other wire to the wire the hook that wire to the key.

Suppose that you have one of the items from the list that you believe conducts electricity, and that you also have a battery, several wires, and a light bulb.

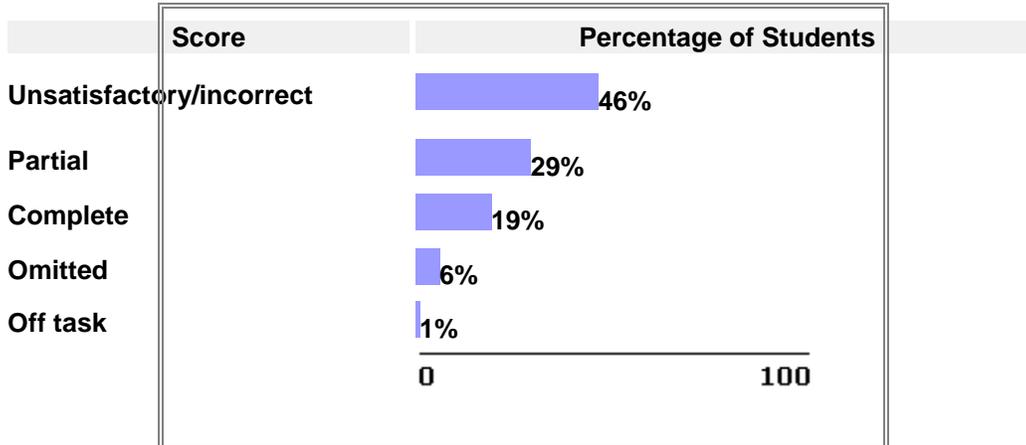
Explain how you could use these things to do a test to find out if the item you chose from the list does conduct electricity. Draw a picture to help explain your answer.

I would connect two wires to the battery & to the light bulb. Then when I would put the wire to the metal fork it would conduct electricity.

Scorer Comments:

The first response includes an incorrect drawing of a circuit, and the second response includes an incorrect description of a circuit. Neither response describes how the circuit could be used to determine the electrical conductivity of an item.

**2005 National Performance Results**



Note:

- These results are for public and nonpublic school students.
- Percentages may not add to 100 due to rounding.

**The Fields of Science:** *Physical Sciences* (Sub content classification: *Energy and Its Transformations*)

**Knowing and Doing Science :** *Scientific Investigation*

## **The Fields of Science**

### ***Physical Sciences***

This question measures basic knowledge and understanding of the following:

## **Knowing and Doing Science**

### ***Scientific Investigation***

Scientific investigation probes students' abilities to use the tools of science, including both cognitive and laboratory tools. Students should be able to acquire new information, plan appropriate investigations, use a variety of scientific tools, and communicate the results of their investigations.