

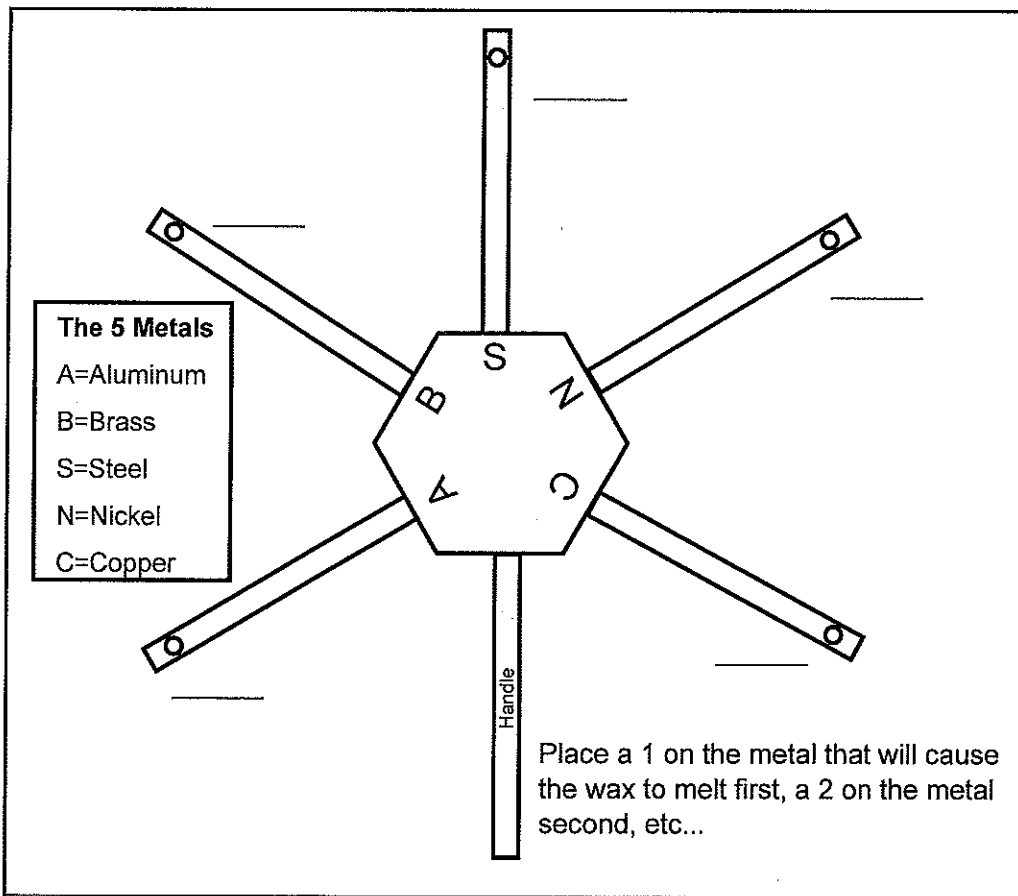
Name \_\_\_\_\_ # \_\_\_\_\_ Per. \_\_\_\_\_

Conduction is the transfer of thermal energy due to the collisions between particles.

Question: Do all metals conduct heat at the same rate? \_\_\_\_\_

Using the conductometer, how can you find out? \_\_\_\_\_

\_\_\_\_\_



## Conductivity of Selected Materials

Substance	Conductivity (cal/secXmeter°C)
Diamond	10,255
Copper	1,633
Aluminum	1,005
Brass	460
Lead	147
Steel	57
Nickel	33
Concrete	5
Glass	3
Water	3
Wood (oak)	0.6
Wool	0.2
Goose Down	0.1
Air & Most Gases	0.1
Foam Polystyrene	0.04

### THINK ABOUT IT

Using the chart above, answer the following questions:

1. Which substance is the best at transferring heat and would be the best conductor?
2. Which substance is the poorest at transferring heat and would be the best insulator?
3. Why does a concrete wall feel cooler than a wood wall in the same room?
4. Of the metals listed on the top of the chart, which would be the best to use when making a frying pan?
5. How are substances with low conductivity rates used in our daily lives?

Name \_\_\_\_\_

## Step 5: Observe, Record, & Analyze Data (Part 3)

Scientific observations need to be recorded in an organized way so the experimenter can analyze the information. All experiments produce data, which are the facts, figures, and other evidence gathered through observations. Making sense of the data is called data interpretation.

Examine the two sets of data below.

### Data Set #1

Five pots were planted with pea plants. Pot #1 received no fertilizer and grew to 2 cm. Pot #2 received 5 ml of fertilizer and grew to a height of 10 cm. Pot #3 was given 10 ml of fertilizer and grew to be 17 cm. Finally, Pot #4 grew to a height of 12.5 cm after receiving 15 ml of fertilizer.

### Data Set #2 (Data Table)

The effect of different amounts of fertilizer on plant height

Amount of Fertilizer (ml)	Height of Plant (cm)
0	2
5	10
10	17
15	12.5

1. Which data set communicates the information more clearly? \_\_\_\_\_

Explain.

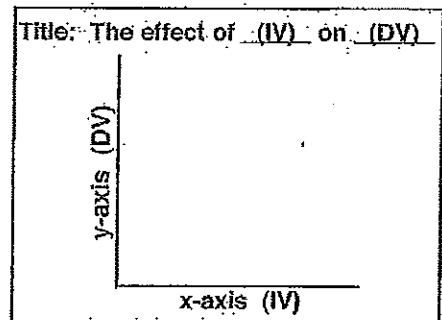
When you create a data table, you should usually use this form to write a title: "The effect of the independent variable (IV) on the dependent variable (DV)." Place the IV in the left column of the table and the DV in the right column.

On a separate sheet of paper, create a data table for each set of data below. Remember to include a title.

- Seeds were planted at different temperatures. The height of the plants was measured after one week.  
8°C = 4 cm    12°C = 7 cm    16°C = 9.5 cm    18°C = 11 cm    22°C = 16 cm    24°C = 12 cm
- Every other month, bears in the state park were counted.  
January = 45 bears    March = 50 bears    May = 56 bear  
July = 53 bears    September = 48 bears    November = 42 bears
- Different kinds of balls were dropped from a desktop. The height of each ball's bounce was measured.  
Baseball = 10 cm    golf ball = 60 cm    basketball = 48 cm  
Ping-pong ball = 22 cm    football = 8 cm
- A student investigated how the amount of study time affected scores on a math test.  
0 hours = 51 points    1 hour = 68 points    2 hours = 72 points  
3 hours = 75 points    4 hours = 80 points    5 hours = 91 points

After making a data table, scientists look for patterns in their data. Often it is easiest to detect patterns once the data is put into graph form. You must decide whether a line graph or bar graph is appropriate for your data. To decide which type of graph to use, look at your IV. If the IV represents the passage of time or change over time, make a line graph. If the IV represents separate types of things, make a bar graph.

A graph should have a title, usually written in the form "The effect of the IV on the DV." The IV is always written on the graph's x-axis (horizontal axis), while the DV is placed on the y-axis (vertical axis). You must label each axis with its variable.



Use the four data tables you created for items 2-5 above and, on a piece of graph paper, make a graph for each data table. Remember to give each graph a title and label each axis.

## Writing a Conclusion For the Conductometer

Name \_\_\_\_\_ # \_\_\_\_\_ Period \_\_\_\_\_

### Written conclusion:

- 1<sup>st</sup> paragraph:
  - Telling if your hypothesis is right or wrong
  - Fully explaining the data
- 2<sup>nd</sup> paragraph:
  - Identifying the independent variable & dependent variable
  - Listing all controlled variables
  - Listing all variables that could not be controlled

### 1<sup>st</sup> Paragraph: (Please use only the information from the 5 materials you selected)

1. Your hypothesis: IF I test different metals ( \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ ), THEN \_\_\_\_\_ will conduct the heat the fastest.

2. My hypothesis was:      correct                      incorrect      and here is the data that shows this:

- My chosen metal was \_\_\_\_\_. This metal transferred the heat to the wax in \_\_\_\_\_. The other metals transferred heat in this way:  
\_\_\_\_\_ in \_\_\_\_\_; \_\_\_\_\_  
in \_\_\_\_\_; \_\_\_\_\_ in \_\_\_\_\_;  
\_\_\_\_\_ in \_\_\_\_\_.
- This data shows that (you **MUST** include DATA in your answer!):

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### 2<sup>nd</sup> Paragraph:

1. The variables used for this experiment were:

- IV \_\_\_\_\_
- DV \_\_\_\_\_

2. What controls were used? (While you didn't set up this experiment, there were controls, list 2)

- \_\_\_\_\_
- \_\_\_\_\_

**Data Table: Create a proper scientific data table**


**Graph: Create a proper scientific graph**

