Kayla is talking on the phone with her best friend, Tiffany. She is also enjoying an afternoon snack: a big bowl of ice cream. As she talks, her ice cream melts faster than she can spoon it into her mouth! Kayla is annoyed: she really wanted cold, hard ice cream, not warm, mushy stuff! She wondered if a different bowl or container would keep her ice cream from melting so fast.

Kayla checks the freezer. Yes, her mother has plenty of ice cream to experiment with. She finds several bowls: plastic, china, and Styrofoam. She gets out the vanilla ice cream to use in her experiment. She thinks the ice cream will melt the slowest in Styrofoam because she has seen her dad use a Styrofoam cup to keep his coffee hot when they go for trips in the car. Kayla figures the Styrofoam will also help keep something cold.

Kayla puts two scoops of ice cream into each bowl. She times how long it takes for each bowl to melt completely. She repeats the melting time measurement three times and takes an average to be sure she has an accurate count of the minutes needed for melting. You can see her data in the data table that follows.

<table>
<thead>
<tr>
<th>Container</th>
<th>Average melting time in minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic</td>
<td>51 minutes</td>
</tr>
<tr>
<td>China</td>
<td>60 minutes</td>
</tr>
<tr>
<td>Styrofoam</td>
<td>71 minutes</td>
</tr>
</tbody>
</table>

**Your task:**

**Answer the following in complete sentences.**

1. What is Kayla's problem?

2. Write a hypothesis for Kayla's experiment.

3. What is the independent variable (the variable that Kayla changes)?
4. What is the dependent variable (or the responding variable)?

5. Did Kayla collect quantitative or qualitative data? How do you know?

6. Write a conclusion for Kayla’s experiment.

**GRAPH** Kayla’s data using the data table on page 1. Be sure to:
   a. start with a pencil to help keep your work neat
   b. use a ruler
   c. have a title
   d. label the X and Y axes correctly
   e. use most of the graph paper
   f. use the correct type of graph
Billy forgot to eat his ice cream while he was watching television, and it melted. He thought the ice cream melted because it was in the light. Billy decided to do an experiment to find out. Here's what he did.

As soon as it got dark, Billy put one scoop of chocolate chip ice cream into two identical bowls. He put one bowl outside where it was dark and put the other in the kitchen where a light would shine all night. Billy got up at dawn and discovered that the ice cream outside was still solid but the ice cream in the kitchen had melted.

"Aha," said Billy, "light makes ice cream melt!"

Do you think Billy's experiment was good? Explain why or why not.
A student was interested in studying how a lifeboat's shape affects its ability to carry passengers.

<table>
<thead>
<tr>
<th>Boat</th>
<th>Size of aluminum foil before shaping into a boat</th>
<th>Shape of boat</th>
<th>Passengers needed to sink the boat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 cm x 30 cm</td>
<td>rectangular</td>
<td>23 passengers</td>
</tr>
<tr>
<td>2</td>
<td>10 cm x 30 cm</td>
<td>oval</td>
<td>24 passengers</td>
</tr>
<tr>
<td>3</td>
<td>20 cm x 30 cm</td>
<td>square</td>
<td>32 passengers</td>
</tr>
<tr>
<td>4</td>
<td>20 cm x 30 cm</td>
<td>triangular</td>
<td>31 passengers</td>
</tr>
</tbody>
</table>

Do you think she designed a controlled experiment? Why or why not?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

What would you do the same and what would you do differently?

________________________________________________________________________

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