1. A student did an experiment to find out if the size of a marble affects the size of crater formed. She filled a basin with flour, covered the surface with cocoa, and dropped the marbles from 100 cm. She recorded the size of the craters. Look at her data table.

<table>
<thead>
<tr>
<th>Marble diameter (mm)</th>
<th>Dependent variable: Size of crater (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trial 1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
</tr>
</tbody>
</table>

a. What is one conclusion that this student could make about the effect of marble size on the size of crater formed?

__________________________________________________________________________

b. How are the craters and the way they formed in the experiment different from craters on the Moon?

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__________________________________________________________________________
__________________________________________________________________________

2. What was the likely size of the impact object that created a crater 100 km in diameter on the Moon?
   (Mark the one best answer.)

- A  100 km
- B  50 km
- C  5 km
- D  0.2 km
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3. Another student did an experiment to find out how the height at which a marble is dropped affects the size of impact crater formed. He filled a basin with flour and covered the surface with cocoa. He released different-sized marbles from different heights and measured the size of the craters. Look at his data table and conclusion.

<table>
<thead>
<tr>
<th>Marble diameter (mm)</th>
<th>Marble height (cm)</th>
<th>Dependent variable: Size of crater (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Trial 1</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>150</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>200</td>
<td>21</td>
</tr>
</tbody>
</table>

**Conclusion:** The marbles I dropped from higher heights made much bigger craters than the ones I dropped from lower heights. This is evidence that the farther the marble falls, the bigger the crater is.

a. What are some problems with the student’s conclusion?

________________________________________________________________________

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________________________________________________________________________

________________________________________________________________________

b. What suggestions can you give the student to help him improve the design of his experiment?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
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4. The image below shows the surface of the Moon. Identify the lunar feature indicated by each arrow.

![Image of Moon Surface]

a. ____________

b. ____________

c. ____________

d. Looking at lunar features b and c above, which one must have formed first? ________
   How can you tell?

5. Look at the images of two of Jupiter’s moons below, taken from the same altitude. The moons are approximately the same age, but moon X has more visible craters than moon Y. Explain why that might be.

![Images of moons X and Y]