Case of the Sleeping Frog

The following statements describe an investigation carried out by a life science student named Laura. Number the steps in the correct order. Place the number 1 next to the statement that describes the first step of the scientific method. Put the number 2 beside the next step and so on. Answer the questions at the bottom.

Laura obtained two large jars and place a living frog in each. She inserted a thermometer through a hole in the screened lid of each jar. Next she placed each of the jars inside a larger jar. Laura filled one of the outer jars with ice cubes. The ice cubes surrounded the jar that held the frog. Laura did not put any ice cubes in the other jars.

Laura went to the library to find information about hibernation. She read several articles on the Internet and in textbooks concerning the topic.

Laura noted that in the jar surrounded by ice cubes, the frog began to move more slowly and finally seemed to go to sleep. The frog’s rate of breathing became slower as well. These changes did not occur in the frog in the jar lacking ice cubes. When the ice was removed from the first jar, the frog gradually became more active.

Laura wondered why frogs hibernate during the winter.

Laura recorded the temperature inside each of the two smaller jars containing the frogs every 30 minutes. She also recorded the breathing rate of the frogs and made other observations about the frog’s appearance and behavior.

After researching the topic of hibernation, Laura made an educated guess. She predicted that she could make a frog hibernate by exposing it to colder temperatures.

Questions:
1. Name a qualitative observation Laura made:

2. Name a quantitative observation Laura made:

3. Identify the independent variable:

4. Identify the dependent variable:

5. Describe the control:

6. What conclusions do you think Laura made in her experiment?

7. How could she increase the validity of her experiment?