NAME:_____

Sea to Shore Thermoregulation Lab Quiz

Instructions: Turn off and stow away all electronic devices. Use the information in the scenario to answer the questions that follow. All questions must be answered *on your own*.

Scenario: A group of researchers investigate whether an insect will move faster as ambient temperature increases. They place 10 insects in 3 different environments: one at 20°C, one at 30°C, and one at 40°C. After 15 minutes, the scientists spend an additional 15 minutes recording how quickly the insects walk around in each environment.

1. Which of the following would be a correct **dependent** variable for this experiment?
   a. insect body temperature
   b. ambient temperature
   c. walking (crawling) speed
   d. insect surface-area-to-volume ratio

2. Which variable should appear on the **X-axis** of a graph of the results?
   a. insect body temperature
   b. ambient temperature
   c. walking (crawling) speed
   d. insect surface-area-to-volume ratio

3. Now suppose the research team designs an experiment to determine whether the insect is a poikilotherm or a homeotherm. Which of the following is the correct **dependent** variable for this new experiment?
   a. insect body temperature
   b. ambient temperature
   c. walking (crawling) speed
   d. insect surface-area-to-volume ratio

Thus far, researchers have used adult insects in their experiment; however, now they're curious to see how their results would change it they used young insects. Young and adult insects are both shaped the same, but young insects are much smaller.

4. At 20°C, young insects would _____ than adult insects because _____.
   a. lose body heat at a faster rate; they have a smaller surface-area-to-volume ratio than the adults
   b. lose body heat at a slower rate; they have a smaller surface-area-to-volume ratio than the adults
   c. lose body heat at a slower rate; they have a greater surface-area-to-volume ratio than the adults
   d. lose body heat at a faster rate; they have a greater surface-area-to-volume ratio than the adults

5. If the researchers wanted to calculate the surface-area-to-volume ratio of each insect in their experiment, they would first determine the surface area (SA) and the volume (V) of each insect. Then, they would calculate ____.
   a. V/SA
   b. V*SA
   c. SA/V
   d. SA*V