NAME _____

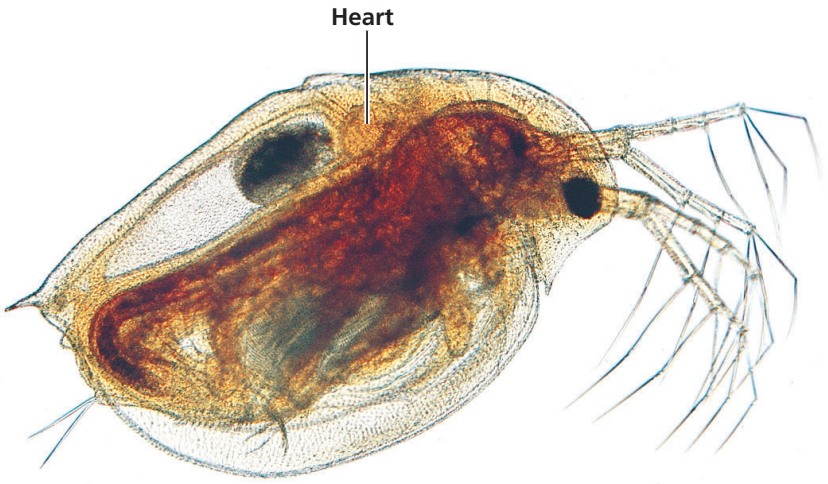
DATE _____

Daphnia Heart Rate

Daphnia magna is a freshwater arthropod commonly found in pools and ponds throughout Canada and the northern and western parts of the U.S. Contractions of its heart are clearly visible through its transparent body. In this activity, you will measure the heart rate at room temperature and then investigate whether the heart rate responds to temperature changes.

Get a thermometer and a stopwatch.

With a pipet, collect a *Daphnia* and place it in the well of a concavity slide. Observe it at 40×. Locate your specimen's heart. If you have trouble identifying it, refer to the *Daphnia* Anatomy sheet. Do not confuse the beating of the heart with the motion of the antennae.



One lab partner counts heartbeats while another keeps time. Count the heartbeat for 15 seconds. Record the count and temperature in the data table. One way to count is to tap a pencil or marker point on paper for each beat and then count the marks.

Heart Rate of *Daphnia*

Temperature, °C	Heartbeats/15 sec	Heart Rate, beats/min

You will now find the heart rate of *Daphnia* in water that is either warmer than room temperature or colder than room temperature. Do you think the heart rate will respond to differences in temperature? If so, how?

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Give a reason for your answer.

Go to a workstation to prepare for testing either warm or cold water. Pour room-temperature springwater into a small beaker (cup) until it is about half full. Transfer your *Daphnia* from the slide into the beaker. To test for cold, add ice to a large beaker and then just enough water to float the ice. Set the small beaker inside the large beaker. If the water level in the large beaker does not come up to or past the water level in the small beaker, add water until it does.

To test for heat, fill a large beaker about one-fourth full of warm water. Set the small beaker inside the large beaker. If the water level in the large beaker does not come up to or past the water level in the small beaker, add warm water until it does.

Set the thermometer into the small beaker and wait until the temperature stabilizes. Once it does, transfer the *Daphnia* from the small beaker into the well of a concavity slide. Again count the heartbeats for 15 seconds and record the information in the data table along with the temperature of the water.

Are the results of testing at different temperatures what you expected?_____