NAME _____

DATE _____

Lumbriculus: Contraction Rate of the Dorsal Blood Vessel

Lumbriculus variegatus is a freshwater relative of the earthworm. It is found most often within decomposing vegetation (leaves, logs, humus) in shallow water around the edges of ponds, streams, and ditches throughout North America. In *Lumbriculus*, the blood is circulated by contractions that travel along a dorsal blood vessel. In this activity, you will determine the rate of contraction of the blood vessel at room temperature and design an experiment to test the effect of a substance on the rate of contraction.

Pick up a worm with a dropping pipet, place it on a microscope slide, and add a coverslip. Water should extend to the edges of the coverslip but not beyond. This is to confine the worm completely under the coverslip. If the area under the coverslip is not completely filled, use the pipet to add more water to the edge of the cover. If there is too much water, use absorbent paper to remove the excess.

Examine the slide under 40× magnification and identify the anterior and posterior ends of the worm. Now look for the pulsation of the dorsal blood vessel. Each contraction begins at the posterior of the worm and travels forward. In the following activity, one of you will be the timer/recorder, and the other will count contractions.

Choose a location in the posterior one-third of the worm in which to count contractions. Begin your count at 0 when the vessel is relaxed at that location, and then count the number of contractions that occur at that point for 30 seconds. Repeat for six counts and then average, rounding to the nearest whole.

Repeat this procedure for a point in the middle one-third of the worm and again for a point in the anterior one-third of the worm.

Table 1. Contraction Rate of Dorsal Blood Vessel

Body Section	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Total	Average	Contractions/minute (Average × 2)
Posterior									
Middle									
Anterior									

Is the contraction rate the same for all three regions? Explain.

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List below some things you think might influence the rate of contraction and give a brief explanation of the expected influence.

Choose a factor from your list and develop a question about the rate of contraction that you can answer through experimentation.

The question we will investigate is

State a hypothesis for your experiment. State your hypothesis in the form of "if …, then … because"—i.e., if this specific variable is changed in this specific way, it will produce this change for this reason. A hypothesis is not a guess; it is a predicted outcome based on prior knowledge.

Experimental Procedure

Give a description of the procedure you will use to test your hypothesis. Be specific. Include the materials needed and how they are to be used, the data to be collected and how they are to be analyzed, and the outcomes expected. Once your teacher has approved your plans, conduct your experiment and report your results.

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