Name_____ Period _____ Date _____

Fish Experiment

STEM Sims

Lesson 2: Does Temperature Affect the Respiration Rate of a Fish?

Most people breathe in and out about 12 - 16 times per minute. A panting dog's breathing rate can be as high as 200 times per minute. Can you find out the normal breathing rate of a fish and see if certain things can affect this rate? Catch your breath and get started on this activity.

Here are some definitions to help you in your investigation.

Breath -	taking in oxygen; one breath is one in and out movement of a fish's gill
Respiration -	the action of breathing in oxygen and exhaling carbon dioxide
Respiration rate -	how fast breathing happens
Temperature -	a measure of the hotness or coldness of something
Celsius (°C)-	a unit of measure of temperature
Variable -	something that can change
Direct relationship -	as one variable increases, the other variable also increases
Inverse relationship -	as one variable increases, the other variable decreases

Doing the Science

1. Open the Fish Experiment Simulation by clicking on the "Simulation" tab.
2. Move the "Temperature" lever on the bottom of the fishbowl to the far-left position.
3. Note and record the temperature and dissolved oxygen concentration in Table 1.
4. Count and record the number of times the gills on the goldfish move in and out for one minute. This is the goldfish's respiration rate.
5. Slide the "Temperature" lever to the right to about the middle position.
6. Repeat steps 3 and 4.

7. Slide the "Temperature" lever to the far-right position.

8. Repeat steps 3 and 4.

Table 1.

Trial	Temperature (°C)	Respiration Rate (breaths/minute)
1		
2		
3		

Do You Understand?

1. What is the independent variable in this experiment?

2. What is the dependent variable in this experiment?

3. On your own paper, make a graph of temperature versus the goldfish's respiration rate.

4. What is the relationship between temperature and the goldfish's respiration rate?

5. Is the relationship between temperature and the goldfish's respiration rate a direct or inverse relationship?

6. How do the results of your experiment cause concern for the survival of fish if global temperatures continue to rise?