

Name _____

Date _____

How does temperature affect organisms?

What effect do you think temperature has on organisms? In this experiment, you will discover some ways that zooplankton and yeast respond to temperature.

Part 1: Zooplankton

Before you begin:

What do you think will happen to *Daphnia magna*, a species of zooplankton, under different temperature conditions? Explain your thoughts:

Note: Daphnia magna will die above 40° C. Be sure to keep this in mind when designing your experiment.

Materials:

| | |
|----------------|----------------|
| Water | Petri dishes |
| Ice | Pipette |
| Hot plate | Microscope |
| Thermometer | Stopwatch |
| <i>Daphnia</i> | Concave slides |

Procedure:

1. Decide how you will determine the response of the daphnia to temperature. What signs will you look for? _____

2. Decide what temperatures you will use to test the *Daphnia* :

3. Decide how long you will place the *Daphnia* at each temperature: _____
4. Decide how many *Daphnia* you will use: _____
5. Obtain approval from your teacher before proceeding.
6. Set up your experiment.
7. Write down your observations and results, and create a graph of your results to share with the class.

Results:

Discussion questions:

1. What did you observe during your experiment?
2. At what temperature did you notice the largest change?
3. What do you think would happen to other aquatic organisms at higher and lower temperatures?
4. Based on this experiment, what can you infer about the impact of global warming on aquatic ecosystems?

Part 2: Yeast

As a class, you will set up an experiment to test the effects of different temperatures on yeast. Yeast are unicellular fungi, and most reproduce asexually through budding. They require oxygen to grow and give off carbon dioxide during respiration. You will be watching to see how much carbon dioxide is captured in each balloon at different temperatures. Before you begin, write down what you think will happen to the respiration of yeast at higher and lower temperatures:

Write down your observations as the experiment progresses:

| Water Temperature | Time | Size of balloon |
|-------------------|------|-----------------|
| | | |
| | | |
| | | |
| | | |

Based on this experiment, at what temperature do yeast respire the most?

Were you able to see an upper extreme temperature at which yeast can survive? If so, what is that temperature? How does that relate to what you know about *Daphnia magna*?

How does this experiment relate to global warming?
