Fishy Business

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Grade Level: 4th and 5th
S.C. Science Standards: 4th Grade - II.A.2.b
5th Grade - II.B.4.a

OVERVIEW: Students will work in groups to investigate how temperature affects the rate of respiration in a fish. They will complete recording sheets.

TEACHER BACKGROUND: Goldfish and Beta fish are hardy species of fish. I recommend you use this type of fish in the investigation. Monitor the students as they complete the activity. This should not be harmful to the fish. Also, please consider what you will do with the fish after the investigation is over. Fish are pleasant classroom pets. If you do not wish to keep them, please find a good home for them.

FOCUS QUESTION: How does temperature affect living organisms?

MATERIALS FOR EACH GROUP:
Clear bowl
Water
1 goldfish or Beta fish
Ice cubes that are uniform in size
Stir stick
Thermometer
Recording sheet

TIME FRAME: One 1-hour class period

CULMINATING ASSESSMENT: The teacher will score each student's Recording Sheet using the following rubric. Share the rubric with the class prior to the investigation.
### FISHY BUSINESS RUBRIC

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Use</td>
<td>Always used materials properly</td>
<td>Used materials properly most of the time</td>
<td>Did not use materials properly</td>
</tr>
<tr>
<td>Cooperation</td>
<td>Always cooperated with group</td>
<td>Cooperated with group most of the time</td>
<td>Did not cooperate with group</td>
</tr>
<tr>
<td>Answers</td>
<td>All answers are correct/reasonable</td>
<td>2 answers are correct/reasonable</td>
<td>0-1 answer is correct/reasonable</td>
</tr>
</tbody>
</table>

### PROCEDURE:

1. **Ask students how they handle temperature changes.** What do they do when they are cold? How about when they are hot? Tell them they will be working in groups to see what happens to fish when the surrounding temperature lowers.

2. **Assign groups of 4 to work together.** There should be a Temperature Tender, a Timekeeper, a Recorder, and a Reporter. Describe each job. The Temperature Tender will add the ice cubes and read the temperature. The Timekeeper will tell when to add the ice cube and when to start counting the gill movement of the fish. The Recorder will write down all the data collected and count the gill movements. The Reporter will report to the class what the group found out and will count the gill movements.

3. **Go over the Recording Sheet with the class.** Make sure they understand that the stirring is only to melt the ice cube and disperse the cooler water and should not touch the fish at all. Ask if there are any questions. As the students get started, the teacher should walk around and assist as needed.

4. **After the investigation, the teacher may want to discuss the data by having the recorders in each group share the information.** As an extension, the teacher may want to combine the data and see if the conclusions that were drawn are still reasonable with the combined data.
FISHY BUSINESS DIRECTIONS SHEET

MATERIALS FOR EACH GROUP:
Clear bowl
Water
1 goldfish or Beta fish
Ice cubes that are uniform in size
Stir stick
Thermometer
Recording sheet for each student

1. Place thermometer in the bowl and take the initial temperature. Record on table.

2. Count the number of breaths the fish takes in one minute by watching the gill movement. Count for 2 minutes. Record the data on the table for TRIAL 1.

3. Add one ice cube. Stir gently to melt ice cube. Take the temperature of the water and record. Count the gill movement for 2 minutes. Record the data for TRIAL 2.


5. Add the 3rd ice cube. Stir gently until cube is melted. Take the temperature and record. Count the gill movement and record data for TRIAL 4.

6. Each group member should copy data down on table. Answer questions 1-3.
FISHY BUSINESS RECORDING SHEET

<table>
<thead>
<tr>
<th></th>
<th>Trial #1</th>
<th>Trial #2</th>
<th>Trial #3</th>
<th>Trial #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Breaths in 2 Minutes</td>
<td></td>
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</table>

1. What happens to the number of breaths as the water temperature decreases?

2. Why do you think this happens?

3. How do fish benefit from this?