Mission Possible: The Fishflop Detective

Science Module
Grades 5-6

by
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Moberly School District

Central Regional MAP Center
Mission Possible: 
The Fishflop Detective

**Purpose:** This module contains open-ended constructed response items and a performance event. In the open-ended constructed response items, students are required to name different elements of an experiment, to draw inferences based on data, and to draw a four energy-level food chain. The performance event requires students to apply the process of scientific inquiry in determining the effect of the environment on fish in an aquarium.

**Show-Me Standards addressed:**
- Knowledge: S4, S7, S8
- Performance: 1.1, 1.2, 3.8

**Grade level:** 6-8

**Subject area:** Science

**Materials needed:** Module packet (containing the student response sheets, the student prompt, and the scoring guides) and a pencil

**Time needed:** one or two 45-60 minute periods

**Instructions for Administration:** Give students the response sheets, the student prompt, and the scoring guides that do not give clues to the correct answers. Make sure the students understand the directions. Go over the scoring guides so students know what is expected for quality.

**Pre-Assessment Instructions:** The teacher may want to review the scientific method with the students prior to administration of this module. Additionally, students should have adequate experience designing, performing, and writing experiments using the 5 basic steps of the scientific method. Students need to have knowledge of the basic requirements for living organisms, including fish, and the effect that changes in the environment can have on their survival.
Mission Possible:  
The Fishflop Detective  
Student Response Sheet # 1

Jill entered a fishing contest in which the goal was to catch the most number of fish for the day. She decided to experiment with 4 fishing lures to see which was the best for catching fish. She chose to try the glow worm, fly-n-bite, whirligig, and mighty minnow lures. Using the same pole, casting each lure into the same area 25 times for a total time period of two hours, she decided to use the whirligig lure for the contest.

1. What was the independent variable for Jill’s experiment?

_______________________

2. Name two of the constants for Jill’s experiment.

_______________________  ________________________

3. Jill did some research on fish and found they were vertebrates and one of the 5 major animal groups. Based on her research which factual statement could Jill make?

   a. All fish are carnivores.  
   b. All fish have cells.  
   c. All fish have must be in water at least 37 degrees Fahrenheit.  
   d. All fish must have clean, unpolluted water.

4. How could Jill change another variable in her experiment in order to improve her chances of winning the contest?

__________________________________________________________________________

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5. Recently, studies have shown that the fish populations in the local lake are declining. What are some possible factors that could be contributing to the declining fish population?
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6. Draw a 4 energy-level food chain that could be found in a local lake or pond. Write the name of each plant or organism.
Mission Possible:
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Student Prompt

Your science classroom has a 10 gallon fish tank, but each time 10 aquarium fish are placed in it, they mysteriously die. Your teacher has hired you to become the class detective to try to solve the mystery of the dying fish. Design one scientific experiment you would do during your investigation to determine the cause of the dying fish. Following the scientific method, explain each step you would follow, including how you would set up the experiment. Be sure to identify your independent and dependent variable, control variable, and include at least 3 constants of your experiment.
Mission Possible:
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Design one scientific experiment you would do during your investigation to determine the cause of the dying fish. Following the scientific method, explain each step you would follow, including how you would set up the experiment. Be sure to identify your independent and dependent variable, control variable, and include at least 3 constants of your experiment. Use this sheet to plan your experiment.

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Item 1: Constructed Response

Correct answer: fishing lures

1 Point: correct answer
0 Points: other

Item 2: Constructed Response

Possible answers: same pole, number of casts, area, fishing time, time period, water, location, day, weather conditions

2 Points: Any two of the answers
1 Point: Any one of the answers
0 Points: Other

Item 3: Constructed Response

Correct answer: b

1 Point: correct answer
0 Points: other

Item 4: Constructed Response

Possible answers: She could change her pole.
She could fish at different times of the day.
She could change her fishing location.
Any other acceptable change that Jill could make.

1 Point: One version of an acceptable answer.
0 Points: Other

Item 5: Constructed Response

Possible answers: overpopulation, change in weather conditions, pollution, too many predators, overfishing, loss of habitat, any other appropriate factor that would cause a decline in the fish population

1 Point: One version of an acceptable answer.
0 Points: Other

Item 6: Constructed Response

Possible answers: Accept any 4 energy-level food chain that could exist in a local lake.

2 Points: The response includes an appropriate 4 energy-level food chain. The energy arrow is in the correct direction and all four animals have been correctly labeled.
1 Point: The response includes an appropriate 3 energy-level food chain. The energy arrow is in the correct direction and all three animals have been correctly labeled.
0 Points: Other
<table>
<thead>
<tr>
<th>Mission Possible: The Fishflop Detective</th>
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<tbody>
<tr>
<td>Performance Event Scoring Guide</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Choice of experiment</th>
<th>3 Points</th>
<th>2 Points</th>
<th>1 Point</th>
<th>0 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The student has chosen an appropriate experiment for the intended purpose.</td>
<td></td>
<td></td>
<td>The student has chosen an experiment that is not appropriate for this purpose.</td>
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</table>

<table>
<thead>
<tr>
<th>Problem Statement</th>
<th>The response includes a well-written problem statement that is appropriate for the experiment.</th>
<th>The response includes a problem statement that fits the experiment.</th>
<th>The response includes a problem statement that is unclear or not accurate.</th>
<th>The response includes an inaccurate problem statement or no problem statement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>The response includes a suitable hypothesis that clearly states the prediction.</td>
<td>The response includes a suitable hypothesis.</td>
<td>The response includes a hypothesis that is unclear or difficult to understand. It may or may not be suitable.</td>
<td>The response includes an inaccurate hypothesis or one that cannot be understood.</td>
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</tbody>
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<tr>
<th>Steps in experiment</th>
<th>The response includes steps that are in logical order and are clearly explained.</th>
<th>The steps are in logical order and are explained.</th>
<th>Some steps are out of order and/or some steps are not clearly explained.</th>
<th>Many steps are out of order or not explained.</th>
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<tbody>
<tr>
<td>Variables</td>
<td>The response includes the independent variable, the dependent variable, and the control variable. Each is correctly identified.</td>
<td>The response includes any two of the specified variables and both are correctly labeled.</td>
<td>The response includes one of the specified variables and it is correctly labeled.</td>
<td>The response includes none of the specified variables.</td>
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| Constants            | The response correctly uses and identifies the three constants. | The response correctly uses and identifies two of the constants. | The response correctly uses and identifies one of the constants. | The response does not correctly use or identify any of the constants. |

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