Name_____ Period _____Date_____

Observing GloFish®:
Making Biological Observations and Drawings

Objective

The learner will make detailed observations of a unique biological specimen: GloFish® fluorescent fish.
The learner will prepare appropriately labeled drawings of the biological specimen.
The learner will use observations and drawings to identify specific specimens.

Introduction

Careful observations are important in the study of living organisms. The success and value of an experiment relies heavily on accurate observation. Detailed observations allow thorough analysis, enable replication of the experiment, and can be helpful when determining sources of error. The data collected when making observations can be written, recorded in data tables, or documented using drawings. The ability to make careful observations requires diligent and focused practice. In this activity, detailed observations of GloFish will be made and recorded.

The purpose of a biological drawing is to make a detailed record of the observed features or characteristics of a biological specimen. Consider the following suggestions when making observational drawings:

- The specimen should be viewed from every available angle prior to beginning.
- Refer back to the specimen frequently while drawing.
- The drawing should be on unlined paper and made large enough to easily represent the features of the specimen.
- The features of the specimen should be clearly labeled and the drawing should be appropriately titled.
- The scale or magnification of the specimen should be noted.
- Be sure to include your name and the date on the sketch.

National Standards Addressed

Science as Inquiry A—Abilities necessary to do scientific inquiry

Materials Per Group

4 GloFish® of the same color
4 clear plastic cups or 200 mL beakers
Unlined paper
800 mL or larger beaker
Pencils
Rulers

Safety Precautions

Students should be careful when transferring fish from one container to another to make sure the fish are not damaged during the transfer.

Procedures

Part A: Making Detailed Observations

1. Obtain a 200 mL beaker or clear plastic cup containing aquarium water and a single GloFish® fluorescent fish.

2. Observe the common features of the GloFish. You may want to lower your head or raise the container to view the fish at eye level. Carefully look at the fish from the side, then facing forward, from underneath, from the tail end and from above. Be sure to view it from every angle.

3. Fill in Table 18.1 with the information you gathered while making your observations.

4. List the features that make the fish you are observing different from other GloFish of the same color. Record your observations in Table 18.2.

Part B: Making a Biological Drawing

1. Obtain an unlined piece of paper and a pencil.

2. Create a detailed drawing of the GloFish observed in Part A.

3. Using a textbook as a reference, label the dorsal fin, anal fin, caudal fin, operculum, eye and mouth of your drawing. It may be helpful to use a ruler or a straight edge to add labeling lines.

4. Observe the specimen closely for any significant physical features (such as stripes or any kind of distinguishing mark); include these in your drawing. Look for anything that would make it easier to recognize the GloFish after it is placed in a container with other fish of the same color.

Part C: Using Observations and Drawings

1. All lab group members should now combine their fish in a single larger container such as an 800 mL beaker or small aquarium.

2. Observe the fish carefully to identify the GloFish you observed in Part A. Do not point out your fish to the lab group at this time.

3. The members of your lab group should exchange data tables and use the distinguishing features written to locate the GloFish® originally described by each lab member.

4. Once you think you have identified the fish described by the other lab group member, verify its identity with that lab partner.

5. Track the number of lab group members that were able to correctly identify a lab partner's GloFish based on the information provided in the data tables. Record this information in Table 18.3.

6. Share data with the class regarding the number of lab group members that were able correctly identify another group member's GloFish. Record this information in Table 18.3.

Table 18.1: Observing a GloFish®	
Body Color	
Number of fins	
Location of fins (describe)	
Number of stripes	

Table 18.2: Distinguishing Features of a Single GloFish®	
1.	4.
2.	5.
3.	6.

Table 18.3: Number Correctly Identified	
Number of Lab Groups Correct	Number of Class Members Correct

Discussion Questions:

1. Why is making careful observations important?

2. How were you able to identify your GloFish® after it was placed into a group of fish of the same color?

3. What percentage of your lab group members were able to locate their GloFish after it was placed into the container with the other fish?

4. Was Data Table 18.1 or 18.2 more helpful in the identification of a specific fish in Part C? Explain your answer.

5. What percentage of your lab group members were able to identify a fellow group member's GloFish? What percentage of the entire class was able to identify another class member's GloFish?

6. A student is getting ready to make a biological drawing of a GloFish. What two tips or suggestions would you share with that student?

Elaborations and Extensions

Students could calculate error percentage using the following formula:

$$\frac{\text{\# of correct students - \# of students in class}}{\text{\# of students in class}} \times 100\%$$

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Answer Sheet

Intended Grade Level
9th, 10th, and 11th

Teacher Information
These activities will require each lab group to have four GloFish® fluorescent fish of the same color.
If plastic cups are used during the observation activities, make sure to have completely transparent (not translucent or opaque) cups to allow for easier viewing.
Students may benefit from seeing professionally illustrated scientific diagrams of fish. A wide variety can be found on the internet, in text books, or in laboratory manuals.
You will need to coordinate sharing of the numbers of students who were able to correctly identify another class member's GloFish in Part C. Students will need class data in order to calculate their answers for question number 5.

Discussion Questions and Possible Answers

1. Why is making careful observations important?

   Observations made during experiments allow others to repeat the experiment, can be used to determine sources of error, and help with the analysis of results.

2. How were you able to identify your GloFish after it was placed into a group of fish of the same color?

   Students who have made careful observations will have recorded specific features such as stripes, coloration patterns and marks that will allow a specific GloFish to be identified.

3. What percentage of your lab group members were able to locate their GloFish after it was placed into the container with the other fish?

   Students should calculate percentage able to locate their own GloFish by dividing the number correct by the size of the lab group and then multiplying by 100. This value will likely be 100% when students are asked to identify the fish that they observed.

4. Was Data Table 18.1 or 18.2 more helpful in the identification of a specific fish in Part C? Explain your answer.

   Data Table 18.2 contains traits that are specific to a single fish which are more useful in the identification of a specific fish among a group.

5. What percentage of your lab group members were able to identify a fellow group member's GloFish®? What percentage of the entire class was able to identify another class member's GloFish?

   Students should calculate the lab group's percentage by dividing the number of students correct by the size of the lab group and then multiplying by 100. The class percentage should be calculated by dividing the number correct in the class by the total number of students in the class and then multiplying by 100.

6. A student is getting ready to make a biological drawing of a GloFish. What two tips or suggestions would you share with that student?

   Tips should include suggestions such as: observe the GloFish from every available angle, refer back to the specimen frequently whiling drawing, draw on unlined paper, make the drawing large enough to show specific features, a title should be included, straight lines should be used when labeling the diagram.