



Field Trip Lesson Plan: Observing Animal Behavior at the Dallas World Aquarium

Goal: Students will observe many species of animals while at the Dallas World Aquarium and will select one animal on which to conduct observations.

Objectives:

1. Students will participate in a discussion on animal behavior, ethograms, and animal observational study.
2. Students will select and observe an animal and will use an ethogram to collect data while at the Aquarium.

Science TEKS: High School Aquatic Science/High School Biology –
1.B, 2.B, 2.C, 2.D, 3.A, 3.B, 4.A
High School Biology – 4.C

(1) Scientific and engineering practices. The student, for at least 40% of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to:

(B) apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems.

(2) Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to:

(B) analyze data by identifying significant statistical features, patterns, sources of error, and limitations;

(C) use mathematical calculations to assess quantitative relationships in data; and

(D) evaluate experimental and engineering designs.

(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:

(A) develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;

(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats.

(4) Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. The student is expected to:

(A) analyze, evaluate, and critique scientific explanations and solutions by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student.

(C) research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field in order to investigate STEM careers.

Materials:

- Dallas World Aquarium Animal Behavior Observation Data Sheet
- Dallas World Aquarium Animal Observation Data Analysis & Conclusions
- Tote bags/small backpacks
- Stopwatches
- Clipboards with pencils attached with string

Introduction/
Background:

1. Explain to the students that their upcoming field trip to the Dallas World Aquarium will allow them to observe incredible animals from all over the world.
2. Share that scientists around the world are curious about animals and interested in their behavior. They spend a lot of time watching animals and logging what they see. This allows them to better understand what the animals are doing and in what contexts the behaviors are seen.
3. Explain that animal behavior scientists often use an ETHOGRAM when conducting observational research. An ethogram is a list of all the behaviors a species might do, along with definitions of each of the behaviors.
4. Mention that while ethograms are usually thorough and include many behaviors, an animal may engage in a behavior not listed on the ethogram. For this reason, ethograms also include “other” as an option. They also include an “out of view” category in the event the animal is not visible during an observation period.

5. To help the students better understand ethograms, develop a hypothetical ethogram for dog behavior as a class. Invite the students to think of dog behaviors. Generate a list that all students can see (such as on a SMARTboard). Include “other” and “out of view” on the list.
6. Next, explain that the definitions for the behaviors should be clear and concise. They should be understandable to anyone, including someone who has never seen the animal before. They must also be objective descriptions of what the behavior looks like rather than subjective interpretations of what the behavior means.
7. Ask the students to share their ideas for definitions of the listed dog behaviors. When the class agrees on a definition, include it next to the behavior on the board/screen.
8. Explain that observing animals and using an ethogram to identify behaviors allows scientists to create ACTIVITY BUDGETS for animals. An activity budget shows approximately how much time an animal spends doing different behaviors throughout the day (and night).
9. Ask the students how a researcher might use an ethogram and observations to build an activity budget for a dog. Invite them to share their thoughts.
10. Explain that one of the ways scientists study animal behavior is through INSTANTANEOUS SAMPLING of a FOCAL ANIMAL. This involves observing a single (or focal) animal on regular intervals (for example, once every minute for an hour) and logging what that animal is doing the instant the stopwatch indicates it is time to observe.
11. Share that there are many important things to consider when scientifically observing animals. You want the results of your research to accurately reflect what the animals are doing. Ask the students to think of ways scientists can ensure their research is done right.

Example responses: Take observations of multiple animals to get an idea of how the species behaves as a whole, take a lot of observations to decrease the likelihood you observe an unusual day in the life of the animal, stay out of sight so your presence does not affect the behavior of the animal, take observations across different times of day/seasons as behavior can be different at different times.

12. Explain that during the field trip to the Dallas World Aquarium, each student will select an animal to observe. They will use instantaneous sampling every 30 seconds for a 5-minute period using a pre-created ethogram and data sheet and a stopwatch.

13. Tell the students that they can select any animal, but they should pick one that is easy to view. This is something they can determine once at the Aquarium.

14. Display the Dallas World Aquarium Animal Behavior Observation Data Sheet on the screen. Explain how the observations will work and how the students should fill out the data sheet. Emphasize that they will need to select only one behavior per observation. This means that if their animal is doing more than one behavior, they should select the behavior seen first and/or best describes what the animal was doing at the time.

Directions:

1. Have students carry a tote/small backpack containing a clipboard attached to a pencil on a string and the data sheet while on the field trip. They should keep the clipboard in the bag until it is time to do the observations to decrease the likelihood that anything accidentally drops into an exhibit.

2. After arriving at the Dallas World Aquarium, remind the students to enjoy watching all the animals but to make sure to allow themselves time to complete their observational research.

**Wrap-Up/
Discussion**

1. Upon returning to school, distribute the Dallas World Aquarium Animal Behavior Observation Data Analysis and Conclusions worksheet. Allow the students time to complete the worksheet.

2. End the lesson with a discussion about the observational research experience. Ask the students to share their thoughts on the following questions:

- *Do you think it would be interesting to do animal behavior research? Why or why not?*
- *Did you encounter any challenges while doing your observations? What were they?*
- *What might you do differently if you were to repeat your observations?*

Assessment:

Comprehension of concepts will be evaluated based on observations of the students during the field trip, participation in discussions, completion of the observational activity, and the answers to the questions on the worksheets.

Modifications:

- To limit the spread of germs (such as the COVID-19 virus), you could have the students wear masks while at the Dallas World Aquarium.
- For students with visual impairment, you could ask an assistant or chaperone to carry and present items for the student to touch that mimic the hair, skin, or feathers of animals like those found at the Dallas World Aquarium.
- For students with sensory sensitivities, you could reach out to the student or the student's parent/guardian for tips to help the child with sensory overwhelm while on the field trip.

Extension
Activity:

1. "Who Lives at the Dallas World Aquarium?" crossword puzzle

This fun crossword puzzle is a great way to generate excitement for the upcoming field trip. It includes many of the different animals the students will see at the Dallas World Aquarium. *Crossword puzzle and answer key included.*