

Ethogram Lesson

At a Glance:

Each lesson assumes a 55-60 minute class period.

There are three lessons that can be done consecutively or inserted as one-day activities

Introduction:

This lesson is designed to inform students about the observational tool called an ethogram. The ethogram is used in animal research to monitor various activities of subjects being observed. The researchers who developed this lesson made preliminary observations of human subjects participating in a professional development workshop. The researchers (who are also middle school teachers) designed an ethogram, and used the tool to answer the question: Does the amount of activity prior to a workshop session affect the participants' alertness during the session? At the conclusion of this lesson, students will be able to develop their own ethogram and answer a question using the ethogram as a data gathering tool.

This lesson will be most effective if the observations can be made of things the students are interested in (i.e. birds on a feeder, a video clip of animals, people in the public, etc.).

OREGON State Benchmarks:

Science:

1. Based on observations and scientific concepts, ask questions or form hypothesis that can be explored through scientific investigations.
2. Design a scientific investigation to answer questions or test hypotheses.
3. Collect, organize, and display sufficient data to support analysis.
4. Summarize and analyze data including possible sources of error.
5. Explain results and offer reasonable and accurate interpretations and implications.

Objectives:

At the end of the lesson, the student will be able to:

1. Evaluate an ethogram for its usefulness in collecting data to answer an inquiry question.
2. Make initial/preliminary observations of a living organism.
3. Demonstrate an understanding of a living organism's behavior by making and using an ethogram to collect data.

Vocabulary:

Ethogram – An observational tool that measures specific behaviors observed over time.

Operational Definition – A clear statement describing the behavior you are observing. (Example: Yawn (the behavior) is operationally defined as “ mouth opened somewhat involuntarily with a prolonged deep inhalation and sighing or heavy exhalation, as from drowsiness or boredom. Once the behavior is operationally defined, all observers using the ethogram know exactly what a ‘yawn’ is.

Protocol – A very specific set of instructions that tell the experimenter EXACTLY what the steps are to follow when carrying out the experiment.

Materials/Resources:

Day 1: Learning about observing behaviors

- Zoo video clips and web cams (<http://www.mnzoo/global/media.asp>)
- Zoo Polar Bear video clips (<http://ties.ohsu.edu/polar.htm>)
- Live and active animals in their natural environment

Day 2: Students Develop and Use Ethograms to Collect Preliminary Data

- Alertness Ethogram Example (provided in this lesson)
- Pencil, paper, clipboard for each student

Day 3: Students Write Ethogram Protocol and Further Data Collection

- Alertness Ethogram Example (provided in this lesson)

Timeline of the Lesson:

Day 1: Learning about observing behaviors

1. Show the class the video clip of some animals in their natural environment or have the class observe animal behavior (in the school or in another setting-zoo, wildlife refuge, bird sanctuary) for 5 minutes. It is best to show the students an animal they are familiar with. If they are observing animals they are unfamiliar with, they most likely will not correctly identify behaviors. Several zoos have live cams on the internet which show several different animals.
2. Identify the primary subject of the observation (the animal they are supposed to be watching).
3. Have students watch the video clip and record the behaviors they see exhibited by the primary subject you identified.
4. At the conclusion of the video clip, divide the class into small groups.
 - a. Have each student share the list of behaviors they observed.
 - b. Each small group should consolidate the list as much as possible to have a common list of behaviors to watch for in the clip. Have them make a data table of those behaviors.
 - c. Instruct the students that you will be showing the same clip and they are to check off the behaviors they came up with in their small groups.
 - d. Show the video clip again and have the students tally the different behaviors. Then, have the small groups share their tally totals.
 - i. The following issues should arise:
 1. Students will have different tallies so they will begin to discuss what each of them meant by the different behaviors. This will lead the group to make up **operational definitions** for the different behaviors (which is a requirement of creating a valid ethogram).
 2. Not all the raters will see the same things – therefore, this leads into a discussion about the importance of training the rater in using observational tools and of doing more than one sampling so an average can be taken.
 3. How often should observations be made? This depends on the type of behavior you are looking for, how many subjects you are observing and how many raters you have.

Day 2: Students Develop and Use Ethograms to Collect Preliminary Data

1. Students should list the things they learned yesterday about observing live subjects.
2. Define the terms **operational definition** and **ethogram**
3. Have the students (in pairs or small groups of your choice) develop an ethogram for live subjects (animals on a video, other student groups) you are having them study.
4. The students should collect some preliminary data today, compare their results, and finally, develop an investigative question they can use the ethogram to answer.

Day 3: Students Write Ethogram Protocol and Further Data Collection

1. Discuss how the students moved from making preliminary observations to an actual ethogram.
2. Define **protocol** and have the students write their own for their observation time. Use the example provided on the example ethogram page.

3. Students should work on answering their investigative question using their ethogram to gather more data while observing their subjects.

Assessment Options: Depending on the level of your students, you may want to assess differently. These are some options. Students should now have an understanding of the vocabulary and use of the ethogram, so you could have them form an inquiry question using ethograms and do a formal science work sample.

1. A scientific lab write up or report can be completed on the abbreviated ethogram investigation.
2. A formal science question and work sample can be produced and scored.
3. Quiz on vocabulary
4. Create a scenario (show a clip, take students to observe animals) and have them create their own ethogram including the vocabulary from the lessons.
5. Once the ethogram is made, collect data as a class or provide the class with data “previously” collected and have the students create a data table and graph and interpret their results.

Modifications:

Several of the lessons are done in small groups, so the instructor can cluster students or mix the levels depending on their preference and knowledge of the students.

SPED:

Give a blank data table that the student can fill in – so he/she does not have to create one from scratch. Also, the time intervals while making observations might need to be longer.

TAG:

Students should work to create their own inquiry using an ethogram. See the attached example of an inquiry to get started. This example could be used to compare alertness between different groups of students (classes).

Extension of this Lesson:

Using the example ethogram provided, the teacher and/or students could design some experiments related to observing alert behavior in classes. It is suggested that the ethogram be used over several class periods and used anonymously (observing the class as a whole) so as to not embarrass students. Some examples of questions one could answer:

- Does activity level before a class affect the students’ alertness during the class?
- Does the type of lesson (lecture, group work, video) affect the alertness during the class?
- Does the subject matter (math vs. science) affect class alertness?

Researcher Name _____ Period _____

ALERTNESS ETHOGRAM EXAMPLE

Ethogram Observation Information

Date (mm/dd/yyyy)	
Time Frame (: to :)	
Location (building/room number)	
Room Temperature (°F)	

BEHAVIORS:

Not Alert

- (-) **Yawn**- mouth opened somewhat involuntarily with a long deep inhale breath and sigh or heavy exhale breath indicating drowsiness or boredom
- (-) **Head on hand**- head supported by hand(s), at an angle < 90°, body may be leaning to one side or appear slouched
- (-) **Eyes closed**- eyes are momentarily drooping or closing
- (-) **Distraction**- attention is occupied by activity other than presentation indicating boredom

(0) **Neutral**- moderate alertness is being indicated by the absence of the listed negative (-) or positive (+) behaviors

Alert

- (+) **Writing notes**- notes and diagrams are written or drawn while speaker is talking documenting ideas and concepts presented
- (+) **Nodding**- head nods at appropriate times in presentation indicating agreement with or understanding of speaker's statement
- (+) **Questions**- hand is raised to ask a question, or question is being asked at an appropriate time demonstrating interest or clarifying understanding

● **ETHOGRAM PROTOCOL:** Observe the behavior of your ethogram subject for 10 minutes and record **behaviors/states** you observe every 20 seconds in the ethogram table below. Yawns and questions are considered **events**. Record them every time they are observed, and make any other observations or notes in the space under the table.

STATE - behavior that lasts for the whole observation interval (20 seconds)

EVENT - behavior that happens in a shorter time than observation interval (i.e. a yawn lasts 2-3 seconds of the 20 second observation interval)

ETHOGRAM SUBJECT:

(individual/group of individuals/area of classroom)

TIME (min:sec)	BEHAVIORS (STATES)							EVENT
	- Y	- H	- E	- D	0 N	+ W	+ N	+ Q
0:20								
0:40								
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NOTES: _____

