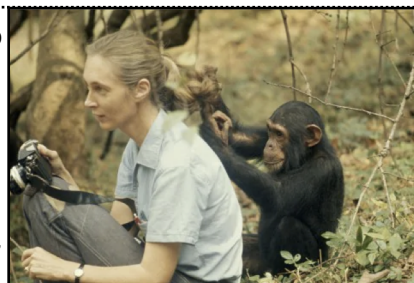


Design an Animal Behaviour Lab



Animals are constantly interacting with their environment, and it is possible to design and conduct experiments to learn more about in what ways, why, and how they respond.

Behavioural biologists study the ways in which animals respond to different conditions in their environment. Often, behavioural biologists spend many years 'in the field' observing their research subjects, such as primates or birds, in order to be able to identify responses and behaviours. For example, Jane Goodall spent decades in the rainforest observing and studying chimpanzees to understand more about how they are adapted for success in their environment.



Jane Goodall treated the chimpanzees she studied as individuals.
This one was named with Freud.
(Derek Bryceon/National Geographic Creative)

In contrast, other behavioural biologists set up experiments in the laboratory, where they carefully alter and control conditions to observe how the organisms, such as rodents or insects, respond to the changes. Plant biologists also carefully observe how plants respond to different changing stimuli in the environment, both in the field and in the laboratory.

With this activity, you will have the opportunity to practice the research skills of a behavioural biologist by designing an investigation about behavior. You will choose which organisms' responses to stimuli you would like to observe and develop a method to study this behaviour.

For example, would you like to see how different insects respond to different smells or sounds? Or how mice respond to the presence of UV light? Perhaps you would like to learn if a cat depends more on its sense of sight or sense of smell in order to locate food...

Once you have decided the subject of your research, think about the type of stimuli and response you would like to investigate. Then, design an investigation into your chosen organism's response to the stimuli. Remember, ethical treatment of living things is part of being a good scientist; therefore you must be sure to design an investigation that avoids any harm or damage to living things.

You will use the investigation-design guidelines in order to help you design the experiment. You will submit a typed report that includes all sections outlined in the guidelines. Since you are not actually executing the experiment, you will simply submit the blank data tables and sample graphs in your desired format.

How does animal behavior connect to our unit on evolution? Well, just like physical structures, behaviours have also evolved in a way to make an animal well-suited to its environment. In his 1963 paper "On aims and methods of Ethology" Nikolaas Tinbergen defined four major areas of consideration when exploring an animal behavior:

Mechanism

aka causation

Why does this behaviour occur? This can include physical morphology (structure), internal biological factors, or external stimuli.

Ontogeny

aka development

How does this behaviour develop over an animal's lifetime? How much can this behaviour change through learning?

Adaptive Value

aka function

How does this behaviour contribute to an animal's ability to survive and reproduce?

Phylogeny

aka evolution

What is the evolutionary history of this behaviour? Which ancestor first possessed the trait? What selective pressures in the past have shaped this behaviour?

Design an Animal Behaviour Lab

...continued

Investigation-design guidelines (ROUGH WORK ONLY)

Problem or question for investigation (*Strand i*)

Hypothesis (*Strand ii*)

Variables (*Strand iii*)

Type of variable	What will be manipulated	Rationale	How to manipulate
Independent			
Dependent			
Controlled			

Materials (*Strand iv*)

List all the materials and equipment you will use.

Quantity	Materials/Equipment	Description of the equipment (if necessary)

Design an Animal Behaviour Lab

...continued

Investigation-design guidelines (ROUGH WORK ONLY)

Method (*Strand iv*)

What steps will you take? Write them out in present tense.

Control group (*Strand iii*)

What is your control group? Why?

Special Considerations

Any special considerations for your lab?

Think about timing, needs of the animal, etc.

Data:

What will you collect? Why are you choosing to collect this?

Tables for raw/processed data:

How will you set up your tables? What will the rows and columns be labelled?

Visual data:

What types of graphs will be used to present your data? Why?

Works cited or bibliography:

Include any sources and cite them in APA format.

Criterion B: Inquiring & Designing

Level	Level Descriptor	Task-Specific Clarification
0	The student does not reach a standard described by any of the descriptors below.	Add your own expectations here!
1-2	The student is able to: <ul style="list-style-type: none"> i. state a problem or question to be tested by a scientific investigation, ii. outline a testable hypothesis, iii. outline the variables, iv. design a method, with limited success. 	
3-4	The student is able to: <ul style="list-style-type: none"> i. outline a problem or question to be tested by a scientific investigation, ii. formulate a testable hypothesis using scientific reasoning, iii. outline how to manipulate the variables, outline how relevant data will be collected, iv. design a safe method in which he or she selects materials and equipment. 	
5-6	The student is able to: <ul style="list-style-type: none"> i. describe a problem or question to be tested by a scientific investigation, ii. formulate and explain a testable hypothesis using scientific reasoning, iii. describe how to manipulate the variables, describe how sufficient, relevant data will be collected, iv. design a complete and safe method in which he or she selects appropriate materials and equipment. 	
7-8	The student is able to: <ul style="list-style-type: none"> i. explain a problem or question to be tested by a scientific investigation, ii. formulate and explain a testable hypothesis using correct scientific reasoning, iii. explain how to manipulate the variables, explain how sufficient, relevant data will be collected, iv. design a logical, complete and safe method in which he or she selects appropriate materials and equipment. 	