

Effects of Environment on Memory

<http://www.accessexcellence.org/ae-bin/view.cgi?id=96bbrown>

By **Brenda Brown**

Type of Entry:

- Lesson/class activity

Type of Activity:

- Inquiry Lab

Target Audience:

- Integrated Science, level 1,2

Notes to Teacher:

You can alter the variables to make the lab longer or shorter; for example, food, room temperature, etc.

Questions for Students to Answer:

This activity helps students answer the question: what effect does environment have on memory. It can help students analyze their own study habits and draw conclusions about their work behaviors.

Preparation Time Needed: 30 minutes

Class Time Needed: One hour

Abstract

As an introduction to the human nervous system, I have created a lab to encourage students to assume the role of research scientist. Cooperative lab groups are established, and students investigate the varying effects of changing environment conditions on their capacity to remember increasing lists of words. A control capacity level is established under normal class conditions. The ability to

remember lists is tested. Conditions include loud music, cold, and light vs. darkness. Students compare the results for individual subjects under the varying conditions, and class data is collected, and analyzed as well.

Project

Purpose: To determine the effects of a variety of environmental factors on the ability to remember increasing lists of words.

Procedure: Classes are divided into groups of three. Each student will assume a role. One student is the data collector, one student is the subject, and one student is the experimental researcher.

Materials needed:

- vocabulary lists
- lamps
- tape of loud music
- tape player

Control: Baseline capacity is established for the subjects' ability to memorize an increasing series of words. This is accomplished by the researcher repeating a series of words beginning with three and adding one word at a time, until the subject cannot repeat the list. The test is repeated three times, and data are averaged.

Example dialogue:

Researcher: "vague, focus, clear"

Subject: "vague, focus, clear"

Researcher: "vague, focus, clear, hazy"

Subject: "vague, focus, clear, hazy"

Note: Any vocabulary words can be used as long as they have similar numbers of syllables.

Sound: During baseline testing no avoidable extraneous stimuli are present. In order to test the effects of external sound on

memory of lists, the subject is exposed to loud varieties of music during the test. The test is carried out as in baseline testing, (except for addition of music), repeated 3 times, and data are averaged.

Example dialogue:

Researcher: "talk, listen, static"
Subject: "talk, listen, static"

Researcher: "talk, listen, static, roared"
Subject: "talk, listen, static, roared"

Tactile: During the next experimental procedure the student is asked to hold two baggies of ice cubes in each hand. The same procedure for collecting data is followed.

Light vs. Dark: During this test students are tested in both a darkened room (3 times) and in a well-lit room (3 times). Follow original baseline testing procedure-Average Data for light and for dark conditions. Compare.

Number of Words Memorized

Student Data Chart:

Trials	Control	Loud Music	Light	Darkness
1				
2				
3				
4				

Average=_____

Class data collected:

Students	Control	Loud Music	Light	Darkness
Student 1				
Student 2				
Student 3				
Student 4				
Etc....				

Class Average=_____

Analysis of Data: An average capacity for memorizing data is completed. For each subject a histogram is drawn for the number of words memorized. Class data is collected for all student subjects and analyzed to determine if there is any correlation between the capacity to remember words under different environmental conditions. Class discussions enable students to analyze class results for the effect on study habits and the potential for memory.

Questions to consider upon completion of information collection:

1. graph the individual subject data on a histogram. Graph the class data as well on the histogram.
2. Under which conditions is memory the best? Can you explain reasons for this?
3. Did all students show the same capacity to remember? Explain.
4. Were all students adversely affected by environmental stimuli or darkness? Explain.
5. Were the results you obtained surprising to you?
6. Does loud music interfere with memory? Do you study listening to music?

7. What conclusions can you reach on the effects of environmental stimuli on learning?

Method of Assessment/Evaluation

Evaluation for this lab is the student write-up of the lab.

Extension/Reinforcement/Additional Ideas

Students should keep a log of their homework assignments. Repeat the most effective