

Honors Physiology Music & Memory Lab

Name: _____

Background: "My music helps me concentrate!"

This argument has been repeated, no doubt, in countless households. The question is: Who is right? Does music actually help you study? Can it affect your concentration, and in a positive or adverse way? This experiment tests just that. Test subjects will be asked to listen to music of their choosing- music they might play while accomplishing a separate task- while completing such a task. They will also be asked to complete the same task, with minor modifications, without music

Objective:

This lab addresses a perennial argument between parents and children: is it okay to listen to music while you are studying? The purpose is to test the effect of music on memory and whether or not listening to music affects the ability of a person to concentrate on a simple task.

Materials and Equipment

- Computer/ device with Internet access
- An iPod or other personal music device
- Pencil and paper to take data
- (35+) Students to act as test subjects



Research Questions:

- How does music affect concentration?
- How does music affect memory retention?
- What effect does music have on the brain?

Important Terms and Concepts:

Memory, neuropathy, synapse, music, demographic, genre (musical), retention, short-term memory, long term memory, linear processing, parallel processing

Experimental Procedure:

1. Choose your first test subject. (You or your partner)
2. Sit him or her at a computer/device.
3. Go to <http://www.play.vg/games/52-Concentration.html>
4. Allow the test subject to play the game twice - the reason for doing this is because people naturally get better at tasks early, and less later. You want your test subjects to be decent at the task, without having enough time to get bored of it.
5. On the **third time**, allow the test subject to wear headphones and play music *of their own selection*. Have them play the game, and record their completion time in a data table.
6. Have them do the game one more time, but without music. Record their completion time in your data table.

7. Repeat the above steps for the second partner. At the end of the lab we will compare the class data of all student results.
8. Compare both 'with music' and 'without music' times for all subjects. Which was better? Did certain people do better and others worse? What might age or gender mean in this experiment? Answer these questions in your **conclusion**.
9. Find a way to graph your **data**, so people understand the results of your experiment!

Notes:

- You should take show all the data you took during the experiment in a table form. (This includes you and your partner's data *and* the compiled class data.
- You should include a graph that compares the class data in at least one way. Make sure your graph is detailed, completely labeled, and accurate (and on graph paper).
- In your conclusion, be sure to describe what your data showed and/or did not show, what takeaways or further steps that could be taken, and what experimental error there may have been (and how might you fix these?)
- Your lab report (typed or handwritten) needs to include the following 4 sections:
 - Data (individual, partner, and class)
 - Analysis (graph of data)
 - Detailed conclusions drawn from the data acquired in this lab
 - Answers to the following discussion questions

Discussion Questions: When answering these questions think not only about the results of this lab, but also our Nervous System Unit, *This is Your Brain on Music*, and the documentary "Alive Inside."

1. Many people find that a certain sound, smell or sight brings back a childhood memory very strongly (such as the smell of a food that your mother often cooked when you were young). Why do you think this is? How has this affected you? Give an example.
2. How is it that a person can no longer recognize his family, or even speak, but upon hearing familiar music from his youth, will awaken? (Think about Henry, from "Alive Inside")
3. What are the benefits of playing personalized music during memory experimentation? How might the results of this lab differed if we were all listening to a specific genre, song, etc.?
4. What is the difference between long-term and short-term memory? How does music affect one or both of these, and is the effect different? Think about your personal experience, this lab, the book and the documentary.
5. Chapter 9 of *This is Your Brain on Music* discusses evolution of humans and the long-lasting survival of music through the process of natural selection. How has music been a beneficial trait or characteristic of human beings? (In other words, why is music beneficial to our ability to survive and reproduce? – Think about 'fitness' based on natural selection)