Science Fair Log Book

October 28,2024-Ms.Schulte and Ms.Kale inform me about the science fair.I get home and start my log book and start to explore my science fair topic choices.I pick the question “Does listening to music affect a human being’s memory?”I also pick the genres I will use which will be:pop,rap,classical,and Punjabi.

October 29,2024-I decided to change the Punjabi genre to rock and roll because if I did Punjabi the results would vary between races.

October 30,2024-I start on my hypothesis.

Nov.1,2024-I finish my title,question,and hypothesis.

Nov.2,2024-I go to Dollarama and get the construction paper needed for my tri-fold.I finalize on the fonts for my writing and write my materials and procedure.

Nov.3,2024-I pick my construction paper colors.

Nov.6,2024-I make the memory test with my sister’s flashcards

Nov.20,2024-I do the background research

Nov.21,2024-I do the experiment on Meher and Roop

Nov.22,2024-I print the charts for Roop and Meher’s results

Nov.24,2024-I convert my information to google slides.

Nov.25,2024-I set up my variable slide and I put my slides in order. I go to Science Club for the first time.

Nov.26,2024-I look through templates but decide to keep the slides basic and decorate the tri-fold instead. I write my purpose slide and decide to change my variables slide.I also pick my photos and change my font size.

Nov.27,2024-I write my variable slide and introduction slide. I browse layouts for my tri-fold

Nov.28,2024-I start on my data results slide

Dec.2,2024-I go to Science Club and browse through templates.

Dec.3,2024-I finish my experiments and record the data along with my analysis slide

Dec.4,2024- I do my graphical results and my conclusion slide.

Dec.5,2024-I proofread all my slides and do my abstract slide

Dec.8,2024-I finish editing and typing

Dec.9,2024-I send my typed information to Ms.Kale and get it printed at Science Club.

Dec.10,2024-I start to cut out all of my slides.

Dec.13,2024-I finished cutting and finalizing the layout for my slides.

Dec.16,2024-I go to Science Club and read through my slides on a laptop.

Dec.17,2024-I start to glue my slides to construction paper and finalize the colors of construction paper.

Dec.26,2024-I finished gluing my slides to construction paper.

Jan.4,2025-I glue half of my slides onto the tri fold.

Jan.6,2025-I go to Science Club and listen to Ms.Kale's expectations.

Jan,11,2025-I finished gluing all my slides to the tri fold.

Jan.13,2025-I go to Science Club and watch the videos of the CYSF that Ms.Kale shows us.

Jan.15,2025-I put the finishing touches onto my tri fold and practice presenting

Jan.17,2025-I present my project to my parents and in front of the mirror multiple times until I have memorized it.

Jan.19,2025-I practice presenting again but this time to my sister and cousins.

Jan.20,2025-I take my tri fold to school and present it to Ms.Kale in Science Club.

Jan.21,2025-The school science fair takes place and I present.

Jan.24,2025-It is announced that I'm going to CYSF

Jan.27,2025-I go to Science Club and I start to fill out my Ethics Form and Basic Information Form.

Jan.30,2025-I finish my forms.

Feb.2,2025-I get the email that my forms got accepted and I am officially in CYSF.

Feb.3,2025- I go to Science Club and: fill out my Declaration Form,get my participant image,header image,and project image done then fill out the Presentation Form. Once I get home I type my Introduction and Question.

Feb.4,2025-I type out my hypothesis,clearly stating that I think no music will have the worst effect while classical music will have the best effect.

Feb.5,2025-I type up my research and state my sources.

Feb.6,2025-I go to Science Club and Ms.Kale shows me a CYSF project. I type my variables.

Feb.9,2025-I type my procedure,materials,and take a few pictures.

Feb.10,2025-I do my experiment on Hannah and Gurneet.

Feb.13,2025-I create the charts for Hannah and Gurneet's results.

Feb.14,2025-I do my experiment on Khushneer,Mehakdeep,Meher,and my mom. I make the charts for their results.

Feb.15,2025-I start writing my Observations.

Feb.16,2025-I finish my Observations and Analysis

Feb.17,2025-I write my Conclusion,Application,Sources of Error,and Acknowledgements.

Feb.19,2025-I input my charts.

Feb.22,2025-I take pictures and input them.

Feb.24,2025-I go to Science Club and get my medal and certificate for the school science fair.

Feb.26,2025- I moved all my information to docs.

Feb.28,2025- I redo my background research and organize it better.

Mar.2,2025- I make my presentation video and upload my log book to the CYSF platform.

Mar.5,2025- I go to Science Club and show all of my information and get my slides printed out by Ms.Kale.

Mar.7,2025- I cut out half of my slides

Mar.10,2025- I finish cutting out my slides and put them all on construction paper.

Mar.12,2025- I go to Science Club and try to memorize my slides

Mar.13,2025- I cut out my title and glue my slides onto the trifold.

Mar.14,2025- I put the finishing touches on my tri fold.

Mar.16,2025- I continue to memorize my information.

**Background Research**

**What different parts of the brain connect to music and how?**

* The corpus callosum make sure both sides of the brain communicate
* The motor cortex handles movement
* The prefrontal cortex manages behavior and decisions
* The nucleus accumbens and amygdala handle emotional reactions to music
* The sensory cortex processes touch
* The auditory cortex listens and understands music
* The hippocampus handles music memories
* The visual cortex is used when a musician reads sheet music or a dancer watches their own performance
* The cerebellum aids movement and emotion.

<https://www.kennedy-center.org/education/resources-for-educators/classroom-resources/media-and-interactives/media/music/your-brain-on-music/your-brain-on-music/your-brain-on-music-the-sound-system-between-your-ears/>

**What are the different types of memory and how are they processed in the brain?**

Short term memory remembers information for a short period of time. It often uses the prefrontal cortex.Long term memory holds information for a long period of time. It uses the hippocampus to work. Episodic memory holds memories of events. It uses the hippocampus and surrounding structures in the temporal lobe. Semantic memory is for facts. It uses the medial temporal lobes to work.

<https://www.verywellmind.com/different-types-of-memory-and-their-functions-5194859#:~:text=Memory%20is%20the%20ability%20to>

<https://memory.ucsf.edu/symptoms/memory#:~:text=The%20hippocampus%20and%20surrounding%20structures,implicated%20in%20episodic%20memory%20functioning>.

**What are the key components of musical perception,and how does the brain process music in comparison to speech or other sounds?**

Musical perception involves rhythm,melody,and harmony. Auditory regions handle sounds while motor regions handle movement. Both music and speech use tone and timing.

Music often sparks strong emotions. A sad song can make us cry while a humorous song can make us laugh. Music's effect on the brain is broader than speech. Speech mainly lights up our language centers.

<https://www.ucf.edu/pegasus/your-brain-on-music/#:~:text=%E2%80%9CProfessional%20musicians%20use%20the%20occipital,to%20music%2C%E2%80%9D%20Sugaya%20says>.

**What is the concept of "musical imagery," and how do people use music in their minds to recall or reinforce memory?**

Musical imagery is like hearing music in your head. People use this to bring back memories like past relationships. Maybe a song brings you feelings of love or sadness. This shows how music and memory are closely linked and can be a trigger for memories.

<https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2019.01904/full>

**How do cultural differences influence how people perceive and relate music to memory?**

Cultural differences deeply influence musical perception. The same songs invoke different feelings throughout cultures.For example,in most Western societies, lullabies help lull babies to sleep. Although, in other cultures lullabies can be seen as unusual and unsettling. This affects memories. Take national anthems. In some countries they are seen as patriotic. In other countries, people might not value them as much. Music and memory are universal and are filtered through our cultural lens.

<https://pmc.ncbi.nlm.nih.gov/articles/PMC4321137/>

**What are the therapeutic uses of music and what mechanisms are believed to underlie these effects?**

Music helps lots of people with memory challenges. This includes people with Alzheimer's disease and dementia. Music can also help lift spirits. Music's impact is linked to how the brain works. Areas of the brain tied to music often stay active. This is true even when other areas are damaged. Music unlocks feelings and moments from the past. This includes childhood events or someone special. Music can offer a sense of comfort and connection.

[https://www.sciencedirect.com/science/article/abs/pii/S014976341930243X#:~:text=Some%20of%20the%20 proposed%20 mechanisms,facilitation%20of%20motivation%20and%20reward%2C](https://www.sciencedirect.com/science/article/abs/pii/S014976341930243X#:~:text=Some%20of%20the%20proposed%20mechanisms,facilitation%20of%20motivation%20and%20reward%2C)

**How do personal associations and familiarity with music influence how people recall memories tied to certain songs or pieces of music?**

Music deeply affects us because of personal connections. A song from your high school days can instantly trigger memories. Hearing familiar music can bring you a sense of comfort. This is because your brain links music to happy and safe times. These emotional links to music create stronger memories. The association makes a memory much more vivid. You might remember exactly who you were with or what you felt at a certain moment. Music acts as a powerful memory trigger.

[https://pmc.ncbi.nlm.nih.gov/articles/PMC10466948/#:~:text=Similarly%2C%20Ford%20et%20al.,but%20only%20 in%20 young%20 adults](https://pmc.ncbi.nlm.nih.gov/articles/PMC10466948/#:~:text=Similarly%2C%20Ford%20et%20al.,but%20only%20in%20young%20adults).

**What are the cognitive benefits of music training, and does learning to play an instrument affect memory abilities?**

Learning a musical instrument gives the brain many advantages. Music lessons can sharpen memory skills. Playing music needs focus and this practice increases attention spans. People learn to block out distractions and they also improve concentration. Playing an instrument uses many parts of the brain. Reading music, moving fingers, and hearing tones all happened at once. These activities strengthen connections between brain areas. Improved brain function leads to better thinking.

<https://www.pennmedicine.org/news/news-blog/2017/january/playing-an-instrument-better-for-your-brain-than-just-listening#:~:text=And%20the%20best%20news%3A%20While,of%20memory%20and%20cognitive%20function>.

**Experiment Results and Information**

**Genres and the Songs used for those Genres.**

Pop- Girls Just Want To Have Fun by Cyndie Lauper.

<https://www.youtube.com/watch?v=ZtE5EZq0NWI>

Classical- Four Seasons by Vivaldi.

[https://www.youtube.com/watch?v=GRovE mo 3HA](https://www.youtube.com/watch?v=GRxofEmo3HA)

Rock & Roll- Hotel California by the Eagles.

<https://www.youtube.com/watch?v=TPDjqZaJmjE>

Rap- Rolex by Ayo and Teo

[https://www.youtube.com/watch?v=LYNK uSe DDI](https://www.youtube.com/watch?v=LYBKuSe1DDI)

**Experiment Results**

**Hannah:**

No Music- 5

Pop -5

Classical- 6

Rock & Roll- 6

Rap- 5 (said Rap music was distracting).

**Gurneet:**

No Music- 5

Pop- 7

Classical- 6

Rock & Roll- 6

Rap- 7

**Meher:**

No Music- 4

Pop- 7

Classical- 5

Rock & Roll- 5 (said Rock & Roll music was distracting)

Rap- 6 (tightly clamped one of her hands over her ear when Rap music was playing)

(Continuously asked me to repeat the colors).

**Mom:**

No Music- 4

Pop- 5

Classical- 5

Rock & Roll- 4 (said Rock & Roll music was distracting)

Rap- 4 (said Rap music was distracting)

**Mehakdeep:**

No Music- 7

Pop- 8

Classical- 8 (stated that since Classical music was boring, she was able to focus better).

Rock & Roll- 5 (said that Rock & Roll music was distracting).

Rap- 6 (said that Rap music was distracting).

**Khushneer:**

No Music- 5

Pop- 6

Classical- 5

Rock & Roll- 7

Rap- 5 (said that Rap music was distracting).