

# Science Fair Logbook

**Dec 26, 2023.**

Science fair ideas

- Honey the medical miracle
- Can fidget tools make you smarter?
- What is the effect of noise on the memory cycle?
- What is the best filtration material?
- Can taste affect smell?

## **Overall Question**

What is the effect of noise on the memory cycle?

1. What groups of people are being used?
2. What puzzle is being used?
3. Which age groups are being used?
4. What type of memory cards are being used?

**Dec 27, 2023.**

I am using at least 5 different age groups with 2 people in each age group.

This experiment does not work on a hard surface because it is hard for the people to flip the memory cards. I then had to switch to a soft surface like a carpet.

**Dec 28, 2023.**

Ideas for the different types of cards

- Mix n' match
- Memory cards

I need a room that is loud and a quiet room.

Hard surfaces do not work. I need a soft surface area for this experiment to work

**Dec 30, 2023.**

**Hypothesis:**

Humans can focus better without distractions such as noise which improves their memory cycle.

**Things that I am using in my Experiment:**

- Logbook
- Memory cards
- Stopwatch
- People (Participants)

**Dec 31, 2023.**

The noise I am using is crowd noise because it is one of the most common types of noise.

The surface area I am using is a carpet because it makes it easier for the participant to flip the cards.

**Jan 4, 2024.**

## **Testing My Hypothesis**

Gather my Materials: Make a logbook, Print it out

Write a procedure: Write down the steps and instructions.

Identify my variables: Independent variable, Manipulated variable, Controlled variable.

Testing: Do the experiment more than once.

Collecting my data: Organize my data into tables, charts, and graphs

Science Journal: Record observations, Collect the research, Draw and label them.

Right Tools: The right tools and materials.

Tables, charts, and diagrams: Keep track of data and always have labels.

Accurate and neat: I am going to print it out so the judges can read it.

Use the right graphs: Pie charts, bar graphs, line graphs.

The conclusion tells what happened in the end.

**Jan 5, 2024.**

## **Questions to research**

### **Why do loud noises affect the memory?**

The brain is wasting resources on the noise so the brain has less capacity to perform other tasks.

### **How does no noise affect the brain?**

The silence tells the brain that there is no tension. It also relieves stress.

### **How does constant noise affect the brain?**

If you are always in commotion with lots of noise it triggers Stress and Anxiety it eventually becomes normal for the brain to hear constant noise.

Some Noise helps people focus such as white noise.

The memory is stored in the frontal cortex.

Long-term memory lasts forever but short-term memory is limited.

The sound is processed through the auditory cortex.

The sound is stored in our primary auditory cortex.

### **How does frequency relate to memory?**

## What is frequency?

Frequency is the rate at which something occurs or when it is repeated.

**Jan 6, 2024.**

Next Research

1. Frequency
2. Auditory cortex
3. Memory

Noise →

Primary Cortex: located in middle.

Noise →



Frontal cortex: located at the front.

**Ear:** Where the noise enters our brain

**Frontal Cortex:** Where the noise and memory are processed through.

**Primary Frontal Cortex:** Where the memory has stored

These types of noises can be stored: low pitch, high pitch, hair cells, auditory nerves, and sound waves.

**Jan 7, 2024.**

Research

How the sound goes to the brain

Source: makes noises

Sound waves: Travel through the air

Outer ear: Goes through

Ear Canal: Has a narrow passage

Eardrum: Vibrates the membrane

Three bones: malleus, Incus, and Stapes Increase the vibration.

Cochlea: Filled with fluid. Sound Vibrations make the fluid Ripple

Steriacolia: A part of the inner ear

Hair Cells: Vibration rides through them.

Ions: A part of the inner ear

Auditory cortex: Reaches its point where the brain can recognize the noise.

**Jan 8, 2024.**

**Research**

**How do sound waves relate to the memory?**

**Jan 9, 2024.**

Variables

Manipulated Variable: The manipulated variable was the frequency the noise was playing at and the memory cycle kept on changing because of the sound waves.

Controlled variable: The controlled variable was the type of cards I was using and the type of noise I was using to conduct the experiment.

Dependent Variable: The responding variable was the time that I was observing.

**Jan 10, 2024.**

Materials

1. Logbook
2. Stopwatch
3. Memory Cards
4. Sound Canceling Headphones
5. Participants (People)

## Procedure

Step 1- Make the memory cards for the experiment.

Step 2- Get the participants to do the experiment.

Step 3- Set up the cards in columns and they must be upside down.

Step 4- Get a stopwatch to test the participants on how long they take, with noise and without noise.

Step 5- Make the stopwatch start and tell the participant to begin.

Step 6- Do this three times with a day in between.

Step 7- Record the data on a computer and print it out.

**Jan 11, 2024.**

## **Research**

Sound is a wave of vibration.

Sound travels through solid liquid and gas.

Sound travels by movement which vibrates the molecules and also causes other molecules to vibrate.



This causes all the molecules to vibrate, which helps sound travel.

When there are more sound waves that pass through a fixed place at a given time that means the frequency is high.

When the waves become less that means the frequency is low.

The human ear is capable of hearing 20HZ to 20,000HZ.

### **Jan 12, 2024.**

Scientists know that memories cause chemical changes in the neurons (nerve cells) in the brain.

The chemical change creates what are called memory paths. these paths can remain in the brain for seconds or a person's entire life.

Scientists also think that there are different types of memory. These include motor skill memory, factual memory, and emotional memory.

Motor skill memory tells people how to do physical things that they have done before.

Factual memory is the storage of facts it can be short-term or long-term memory.

Emotional memory is the memory of emotions. it is always long-term memory.

### **Jan 13, 2024.**

## **List**

- Make an application.
- Get pictures.
- Finish writing my research.
- Make graphs and tables.
- Make a conclusion.
- Write down what I learned.
- Get the printouts at the library.

**Jan 14, 2024.**

### **Application**

This question helps people by proving that different people have different learning skills and in the future people can use this to learn better.

**Jan 15, 2024.**

### **Conclusion**

In conclusion, I have figured out that people who have been living in noise exposure their whole life have changed their frontal lobes. These people took more time to match the cards in no noise than in noise. But some people focused better without noise.

This long-term noise exposure can affect a person's frontal lobe by causing stress and anxiety for the person.

Loud noise can create physical and psychological stress. It reduces productivity and interferes with communication and concentration skills. The most common health problem it causes is Noise Induced Hearing Loss (NIHL).

Exposure to loud noise can also cause high blood pressure, heart disease, sleep disturbances, and stress. These health problems can affect all age groups, especially children.

**Jan 16, 2024.**

## **Citation's**

### **NIH**

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6901841/#:~:text=In%20particular%2C%20noise%20increases%20the,seem%20to%20affect%20performance%20speed.>

### **BMC**

<https://behavioralandbrainfunctions.biomedcentral.com/articles/10.1186/1744-9081-6-55>

### **Brittanica**

<https://www.britannica.com/science/environmental-noise>

### **SCI AM**

<https://www.scientificamerican.com/article/ask-the-brains-background-noise/>

