

# The Power Of Music



## FILM

- ▶ **Space Rocks!**
- ▶ **Elli's Little Corona Lesson- Totally Mad!**
- ▶ **Knietzsche and Grief**
- ▶ **Knietzsche and Health**
- ▶ **Sci-PY Reporter - Be Happy Stay Healthy**
- ▶ **Youth and Corona**

## KEY OBJECTIVES

- 1 **Understanding the connection between music and our brain.**
- 2 **Test our brain's ability to respond to different types of music and analyze if it affects our temperament.**

## INTRODUCTION

Music has been scientifically proven to have a powerful effect on the brain. Research shows that music can help in many aspects including pain relief, stress relief, memory etc. Music can also affect our emotions, our response to situations, consumerism and also our identity.

How does it work: When music system puts out vibrations that travel through the air and get inside the ear canal, these vibrations are picked up by the eardrum and are transmitted into an electrical signal that travels through the auditory nerve to the brain stem. Here it is reassembled into something we perceive as music. Music is processed in our auditory cortex (listening), motor cortex (physical response), visual cortex (reading the music, watching dance moves), cerebellum (movements, emotional response), hippocampus (memory of a tune) to name a few.

Most people have different musical interests, but the taste in the type of music is not a significant factor– the emotional connection is. When a song that a person seems to enjoy is playing, the limbic system (the

### TOPICS

Music emotional health  
mental wellbeing hobby  
neuroscience

### KEYWORDS

Sound sound wave music  
emotions emotional response  
auditory nerve brain vibrations  
pitch frequency neurotransmitters

### LEVEL

Primary School Secondary School

### RESOURCE TYPE

Experiment Activity

### INTENDED AUDIENCE SIZE

25-30

### MODE OF DELIVERY

Large venue setting small group  
live online

### TIME FOR ACTIVITY

30 min.

# The Power Of Music

part of the brain that controls emotion) responds to this activity. As a result, music that evokes emotion can have a direct effect on one's mood.

## GUIDING QUESTIONS

- What is sound? - Sound is defined as vibrations that travel through the air or another medium as an audible mechanical wave.
- What is music? - Music is composed of sounds with a fundamental frequency and overtones.
- What is noise? - Noise is what we think is unwanted-sound considered unpleasant, loud or disruptive to hearing.
- Have you ever felt that different types of music appeal differently to you? Do some types of music seem just like noise?
- Does any particular music put you to sleep faster, make you feel more energetic or gets you agitated?
- What happens in our brain to trigger such changes?
- Does listening to music in the womb have any effect on the baby?



## MATERIALS / PREPARATION

### FOR THE STARTER ACTIVITY:

- 4 similar glasses or mason jars
- Water- about 500ml
- A spoon or a fork

### FOR THE MAIN ACTIVITY:

- a device to play music
- a sheet of paper
- pencil/pen
- earphones or headphones (optional)

## TASKS/PROCEDURE

### PART 1 – STARTER ACTIVITY: LET'S MAKE OUR OWN MUSIC

Keep four similar glasses or mason jars on a table. Use a metal spoon or a fork to tap against each of the glasses. Do they sound same or different? Now, pour different amounts of water in each of them. You may make it more fun by adding different food colouring in each of them to make it look like a rainbow. Use a spoon or a fork to tap against the glasses again. What do you hear? Is the sound different in each glass? Why?

What is happening: Sound is a disturbance that travels through a medium as a wave. In this experiment, tapping on the glasses with the spoon disturbs the particles of the jar causing them to vibrate. The vibrations in the jar are transferred to the air surrounding the jar, creating a sound wave. When the jars are all empty, the vibrations and the sounds are all the same. Adding different amounts

# The Power Of Music



of water to the jars causes the vibrations (and sound) to change.

You can change the pitch of the sound produced by the amount of water you put in the glass. Pitch is how high or low the sound seems to a person and it depends on the frequency of the sound wave. When you add more water to the glass, the pitch is low. This is because the high volume of water in the glass makes it more difficult for the glass particles to vibrate, so the vibrations of the glass are slower and they have a lower frequency. When you add less water to the glass, the pitch is high. This is because the low volume of water in the glass allows the glass particles to vibrate more easily, so the vibrations of the glass are faster and have a higher frequency.

## PART 2 – MAIN ACTIVITY: LET'S LISTEN TO SOME MUSIC

Now that we know what sound is, let's listen to some music. The Educator plays the tunes (Google slide link attached below) without mentioning the emotion connected to the tunes.

### Points to be noted:

- 1 Do not give any clues on the kind of music that is going to play.
- 2 Ask the children to close their eyes and listen to the music. Earphones/ headphones can make this experience better.
- 3 Play the first tune and ask the children to follow the steps a), b) and c), mentioned below while they are listening. Repeat the same with all the 5 tunes.
- 4 You do not need to play the whole song. 1-2 mins is sufficient.
- 5 Google slide link for the songs:

### Ask the children to:

- a Draw what they imagine while listening to each tune. (Let them listen to the tune for about 1min with their eyes closed and then open their eyes to draw what they imagined.) It could be a simple doodle or they could use paint/colours to make a more elaborate drawing.
- b Write the emotion that connects to the music – it could be a word, a descriptive sentence or a scenario.
- c When would they like to listen to this type of music? Eg. When they are dancing, when they are sad, when they are exercising etc.

## PART 3 –MAIN ACTIVITY: LET'S CONNECT MUSIC AND EMOTIONS

- 1 Ask the children to draw 6 columns as shown below in a book/a sheet of paper.
- 2 Play the songs again, one by one (slide 8 to 12). This time the children may keep their eyes open and watch the slide to help make a connection between a song and an emotion.
- 3 Make sure the Educator does not tell/ express in any way the emotions of the song out aloud.

### Ask the children to:

Mark each song in the columns they feel it belongs to. They can number the songs in the order they listen to. Please note that they are free to mark each song in more than one column. If marking a particular song in the 'other' column, please ask them to name the emotion they feel.

# The Power Of Music



HAPPY	SAD	NOSTALGIC	UPLIFTING	ANGRY	OTHER

## FOSTERING DISCUSSIONS

- 1 Did you feel a connection between music and emotions?
- 2 Did you feel that your emotions can be controlled by music – eg. listening to calming music made you feel less agitated?
- 3 Is your column different from your friends? Understanding that each person perceives it differently makes us more accepting of people and teaches us tolerance. Sometimes you might find that your best friend might have a totally different analysis and that is completely alright.
- 4 If the same experiment was conducted on adults, do you think the results would be different? If so, what do you think would be different? Test it out on your parents/carers.
- 5 Music has always served as morale boosters for the astronauts in the International Space Station. Why do you think that is? Does it have an effect on their mind?
- 6 Have you observed how music has been used in films and videos to set the mood? Can you picture a film with no music or sound effect at all? Would you like that experience?
- 7 Have you heard of music therapy – the use of music to accomplish targeted goals? Can music make people more productive? Do you think it will work for you?

## SAFETY INSTRUCTIONS

If using earphones/headphones, ensure the volume is not too high.

## POSSIBLE EXTENSIONS

- 1 What are neurotransmitters and how does it affect our emotions? Can listening to music boost the production of dopamine, serotonin and other chemicals in our brain?
- 2 Try this out- Can appropriate music make you tolerate certain tasks better – Eg. Listening to music while doing your chores, hanging up the laundry or washing the dishes?
- 3 To explore more sound based activity.

## AUTHORS AND SOURCES

Designed and submitted by Yoshida Menon and Preveena Nandakumar, Science Educators, India