

# SOUND BALL

## **Purpose of the Activity:**

Explore the effect of distance from the sound source on the perception of sound. Classify sound sources into natural and artificial sound sources.

## **Transdisciplinary Theme:**

Where we are in place and time



**CURIOUS  
BOX** 



# INQUIRY CYCLE

## TUNING IN

Let's Spark  
Curiosity



## FINDING OUT

Let's Start  
Exploring! / Video



## SORTING OUT

What Should  
Little  
Scientists  
Explore?



## GOING FURTHER

For the  
Inquisitive Minds,  
Scientific  
Explanation, What  
Else Can We Do?



## TAKING ACTION

Question of the day?



## MAKING CONCLUSIONS

What Did We  
Discover / Activity  
Pages / Exit Card



# SOUND BALL

## Let's Spark Curiosity

A poster titled "Can You Sing in Space?" is hung in the classroom. The following questions are asked to students:

- Do you know what sound is?
- How is sound created?
- Can you distinguish between loud and soft sounds?
- 

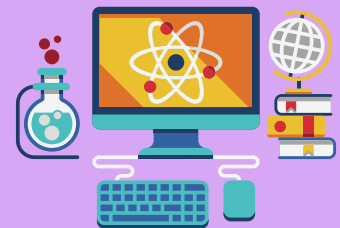
"Imagine the chirping of a bird. If that bird moves a little farther from you, how would its sound reach you? Have you ever thought about why sound changes as it moves away from its source? How does sound seem when it's close? When sound is close and very intense, the energy of the sound can interact with an object, causing it to vibrate and move. Let's see what we can discover together in today's activity." is said. Students are asked to examine and take out the materials for the activity.

**Note:** Don't forget to get some double-sided tape or adhesive before the activity!

## Let's Start Exploring!

The activity video is watched by pausing. The set contents are checked before starting the activity. All unboxing steps are carried out together with the students.

Watch the video by pausing!



### Set Content

- |  |   |
|--|---|
| <input type="checkbox"/> Sound bomb roll<br>.....        | <input type="checkbox"/> "Sound Sources" activity sheet<br>.....  |
| <input type="checkbox"/> Perforated lid<br>.....         | <input type="checkbox"/> "Can You Sing in Space?" poster<br>..... |
| <input type="checkbox"/> Balloon<br>.....                | <input type="checkbox"/> Target<br>.....                          |
| <input type="checkbox"/> Sound bomb cover label<br>..... |   |

## How Do We Do It?

1. Take the sound bomb cylinder and perforated lid.
2. Place the perforated lid vertically inside the cylinder to make it easier to fit.
3. Twist the lid into place inside the cylinder.
4. Take the balloon and stretch it a little with your hands to make it easier to attach to the cylinder.
5. Turn the cylinder and attach the balloon, adjusting the balloon edges.
6. Peel the adhesive on the label and stick it onto the cylinder.
7. Attach the legs of the scorecard.
8. Pull the balloon back and try to knock down the scorecards.
9. Experiment with different distances to compare the effect of distance.

## What Little Scientists Should Explore?

**The following questions are asked to students:**

- Does every sound have a source?
- What are some sound sources? Can you give examples?
- Can sound move an object?

### **What is Sound?**

From the moment we're born, we use sounds to communicate with our surroundings. Simple vibrations that the ear can hear are called sounds. Sound is created when materials vibrate. Many things produce sound, like car horns, birds, people's voices, and the sound of rain. Things that can produce sound are called sound sources.

Sound from a source spreads out like ripples when a drop of water falls on still water. Sound travels in waves through the air and is invisible. Sound doesn't travel in an airless environment. . Sound travels in waves through the air, as well as through water and solid objects. Sound travels the fastest through solids, then through liquids, and the slowest through gases. Sound doesn't travel in an airless environment , so it doesn't travel in space.



### Can Sound Move an Object?

Sound waves, like vibration waves, can cause objects to crack, move, or break without physical contact. In short, objects can be moved by waves when their natural frequency is used. Also, the closer the sound waves are, the better we hear. As the sound source gets closer, the sound's intensity increases, and as it moves away, the intensity decreases.

**Note:** Light travels faster than sound, which is why we see lightning before hearing thunder.

### What are Sound Sources?

Some sounds we hear are natural, while others are artificial. Sounds that occur naturally are called natural sound sources, like thunder, the sound of wind, waves, and water. Sounds created by humans are called artificial sound sources, such as sounds from musical instruments, vehicles, and technological devices like televisions and phones.

## Scientific Explanation for the Curious Ones

### The question is asked to students:

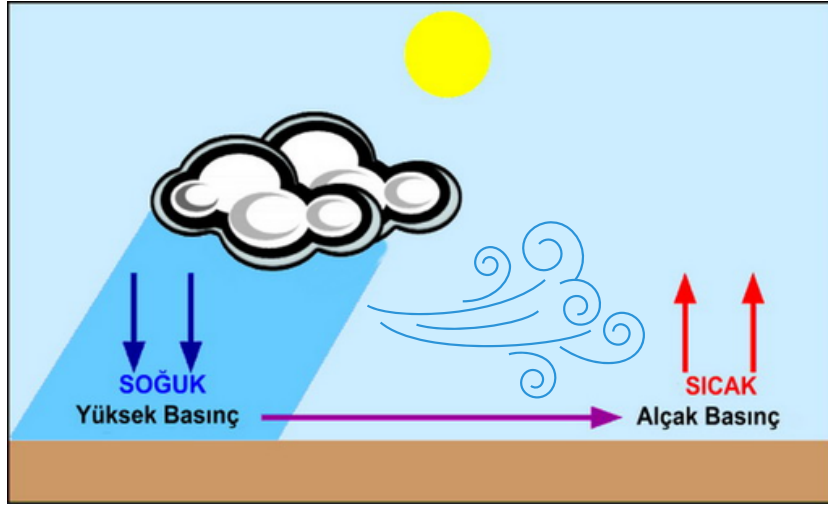
- How did the sound bomb make objects move?

Inside the sound bomb cylinder is full of air. It works by using the air volume in the cylinder and the shape of the edges of the container to create a circular effect.

When the balloon is stretched on the sound bomb, it increases the air volume inside the container. When the balloon is released, the air volume quickly decreases. Air slows down at the center of the sound bomb, and some of the moving air hits the edges, slowing down further. The air in the center keeps moving quickly, creating a circular air vortex.

The air vortex travels a certain distance and can be felt of its energy when it hits a person or object. This moving air is powerful enough to move lightweight objects like paper pieces. The amount of movement depends on the incoming energy.

When the wind blows things around, we see the power of the air. Wind forms as a result of a pressure difference between two points (regions). This pressure force is the power that creates wind. The greater the difference, the stronger the wind force.



There is a similar principle in the sound ball as well. The more the balloon is stretched, the more air fills inside. Due to the difference in air pressure between the center and the edges of the cylinder, a force is created in the outward direction. Objects around it move according to the amount of this force.

## What Else Can We Do?

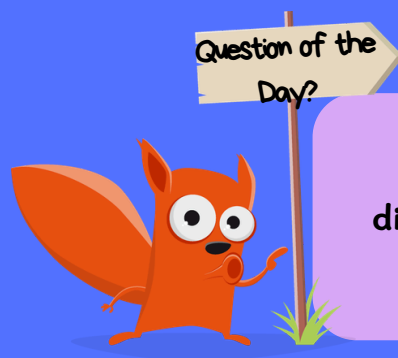
Dear Teacher,

You have discovered the importance of our distance from a sound source in hearing it with future scientists. To reinforce the topic, you can do try the following activity:

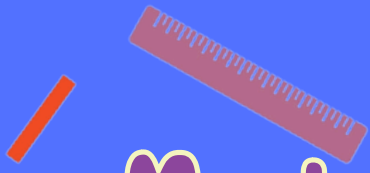
- Choose a student with a strong voice.
- The student loudly says “future scientists” from the front of the board.
- The same student, with the same tone, speaks from the back of the classroom.
- Finally, the student says it once more from the hallway with the same tone.
- Discuss with students how the sound intensity varies.

## What Did We Discover? / Exit Card

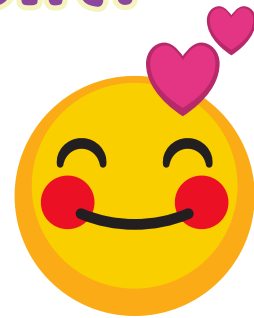
“Today, we made a sound ball and explored sound waves and the properties of sound propagation in an enjoyable way. How did you feel during this activity?” is asked. “Sound Sources” activity sheet and the exit card are completed.



**Sound reaches us in a series of different tones and frequencies. Do you think it could have colors?**



Mark how you feel with  
this experiment!



# CURIOUS BOX



miniskop

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