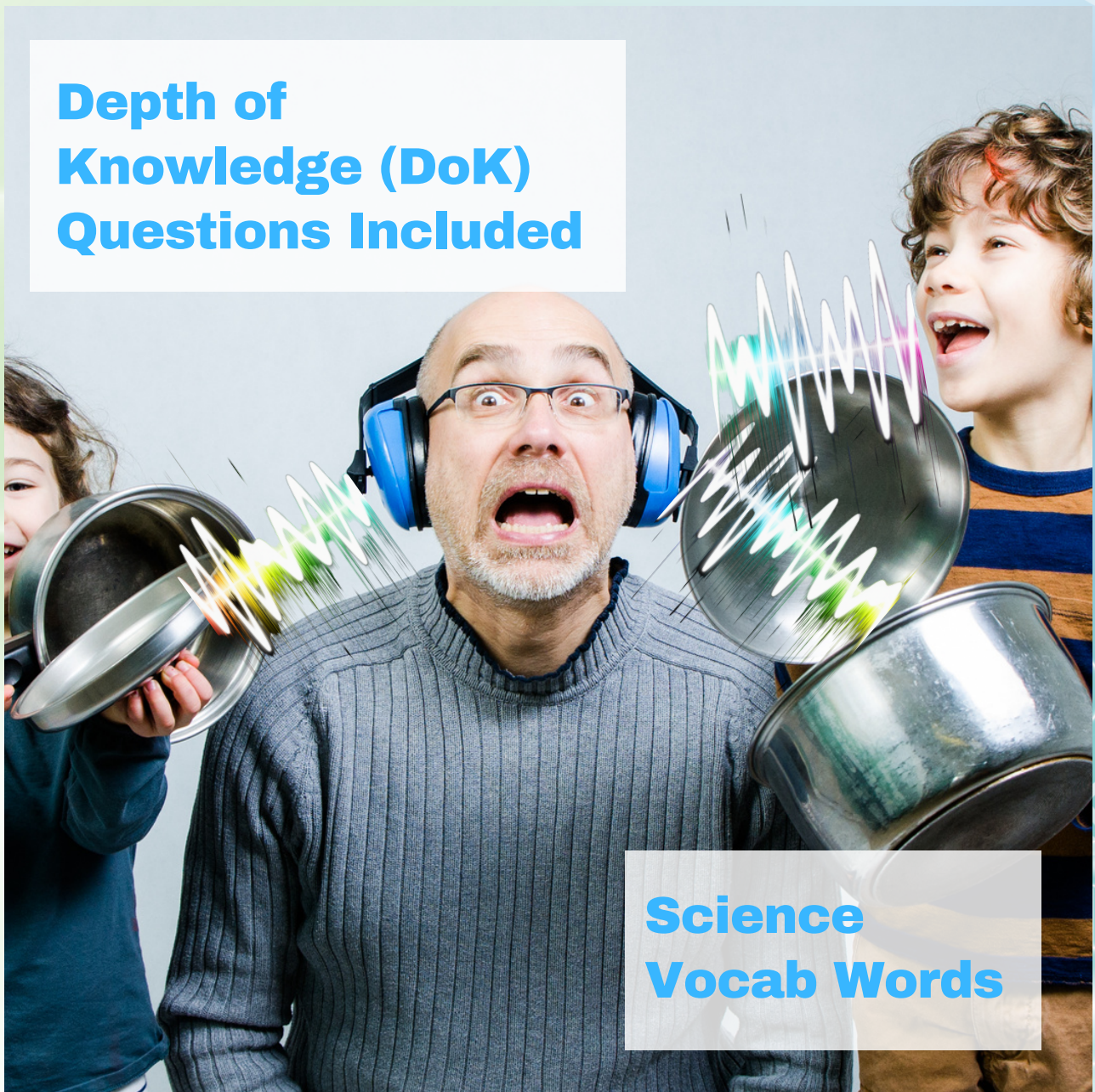


# THE AMAZING WORLD OF SOUND AND VIBRATIONS: A TALE OF DISCOVERY

STEM ED TODAY SCIENCE STANDARDS-BASED STORY

**1-PS4-1** Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.

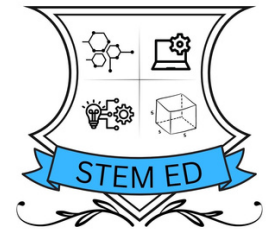
**Depth of  
Knowledge (DoK)  
Questions Included**



**Science  
Vocab Words**

LEAD BOOK DEVELOPER: KIRK STEIN

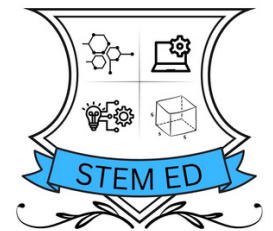
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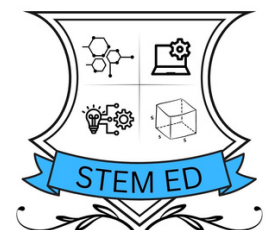
Developed by Kirk Stein, STEM Ed Today creator and editor. Certified in STEM Education from the National Institute for STEM Education.

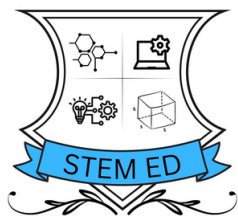


The following materials utilized the National Institute for STEM Education NCST approach and were intended to align with the content covered in the National Certification for STEM Teachers.



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# Welcome!

Dear Readers,

Welcome to STEM Ed Today! We are committed to providing high-quality STEM education resources, including engaging lessons, hands-on STEM kits, and up-to-date news and information on the latest developments in STEM education. At STEM Ed Today, we believe in the four key pillars of education, which are:

1. **Knowledge Acquisition:** We believe that education should focus on acquiring knowledge and skills that are crucial for personal and intellectual growth. This includes learning traditional academic subjects such as science, technology, engineering, and mathematics (STEM), as well as developing critical thinking, problem-solving, and analytical skills.
2. **Practical Skills Development:** We believe that education should also focus on developing practical skills that are necessary for success in the workplace and everyday life. This includes vocational and technical training, as well as opportunities for hands-on learning such as internships, apprenticeships, and project-based learning.
3. **Social and Emotional Learning:** We believe that education should promote social and emotional learning, which includes developing empathy, understanding, and respect for others. This involves learning about different cultures and perspectives, as well as developing the skills and attitudes needed to work and interact with others effectively.
4. **Personal Growth and Self-awareness:** We believe that education should also focus on personal growth and self-awareness, which includes developing one's own identity, values, and beliefs. This involves reflecting on one's roles and responsibilities as a member of society and cultivating ethical and moral values that align with one's personal beliefs and values.



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# Vibrations Make Sound



A group of curious 1st grade students set out to investigate the fascinating world of sound and vibrations. They began by playing with their toys and found that hitting a drum made a **sound**. 🙌

They wondered how that was possible and realized that the drum was **vibrating**, which created the sound they heard.



## Sound

Sound is something we can hear with our ears. For example, when you clap your hands, it makes a sound.



## Vibrating

Vibrations are when things shake back and forth very quickly. For example, when you shake a toy rattle, it makes a sound because of the vibrations.



## DoK: Recall

What did the children learn about sound? How was sound is created?

# Sound Travels in Waves



As they continued to **investigate**, they learned that everything that makes a sound vibrates. They clapped their hands, tapped on the table, and even sang, feeling the vibrations with every motion.

They also discovered that sound travels through the air in waves, and the faster the waves vibrate, the higher the **pitch** of the sound.



## Investigate

Investigate means to look for clues or answers. When you investigate, you try to find out more information about something. For example, if you see footprints outside and want to know who made them, you can investigate by looking for more clues.



## Pitch

Pitch is a way we describe how high or low a sound is. Imagine a bird chirping and then imagine a lion roaring. The bird's chirp is high pitched, like a squeaky toy, while the lion's roar is low pitched, like a big, deep rumble.



## Comprehension

How do different materials affect the way sound travels?



# Whatever Makes Sound Vibrates



The children's curiosity led them to investigate further, and they found that different materials can affect the way sound travels.

They hit a metal pan, and it made a loud, ringing sound, while a rubber ball made a softer thud. They realized that materials vibrate differently, creating unique sounds.



## Application

Can you think of another experiment the children could conduct to investigate sound and vibrations?



# Sound Experiments



Excited to learn more, the children tried out more experiments. They filled jars with water and tapped them with a spoon, noticing how the level of the water affected the sound. They even created their own instruments, like a guitar made out of a shoebox and rubber bands.

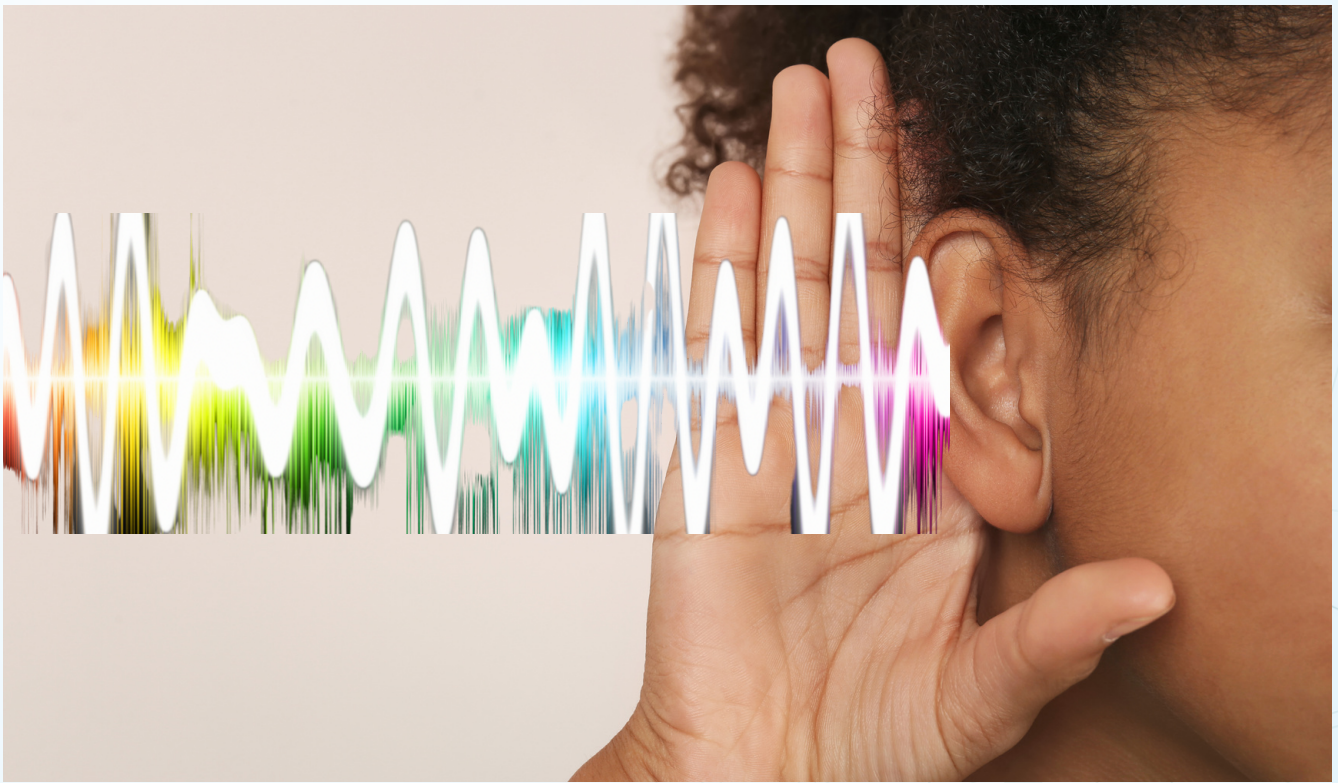
By tightening or loosening the bands, they could make different sounds and investigate how vibrations work.



## Analysis

How do vibrations create sound, and how do sound waves travel through the air?

# Sound Is Caused By Vibration



Their adventure taught them that vibrations make sound and that sound can make materials vibrate. They also discovered that they could investigate sound and vibrations by experimenting with different materials and seeing how they vibrate. And whenever they heard a sound, they knew that it was caused by something vibrating.

The world of sound and vibrations is an incredible one, full of wonder and discovery. And as the children continued to explore, they knew that there was always something new to learn about the way our world works.



## Synthesis

If you could create your own musical instrument, what materials would you use, and how would you use vibrations to create sound?

# GLOSSARY



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