

THAT'S A SOUND IDEA!



TEACHER GUIDE

WONDER



PLANNING

Here's a suggested schedule for this kit! The activities should be completed in order, but you can choose when the lessons take place over time.

ACTIVITY INFORMATION	SECTION (S)	TIME REQUIRED	DAY/ LESSON
ACTIVITY 1: ON THE BALL It's the battle of the tuning fork vs. the ping-pong ball. What will happen...and why? Time required: 45 min	<input type="checkbox"/> Use the Fork	45 minutes	Day 1
ACTIVITY 2: PEPPER PARTY It's the battle of the tuning fork vs. pepper. What will happen? Time required: 1 h 45 min	<input type="checkbox"/> Jump Around	30 minutes	Day 2
	<input type="checkbox"/> Back and Forth	30 minutes	Day 3
	<input type="checkbox"/> Loud		

ACTIVITY 3: M...

Full schedule available with purchase

? Question 3: What do you think was making the ball move?

Answer: Answers will vary.

How to Help: Accept any reasonable answers, including “the sound,” “waves,” “buzzing,” etc. • However, ensure that the student understands that it is not simply the force of moving against the ball because the tuning fork was not moving very much when the two objects touched.

? Question 4: What are two questions you have about what happened?

Answer: Answers will vary.

How to Help: Press for questions that ask what would happen if certain things were changed, like the type of ball, the type of tuning fork, the length of the string, how hard the fork was hit, and more.

2

activity

PEPPER PARTY

Your student just saw the tuning fork make the ping-pong ball move with just sound. Now, they will make pepper move with the tuning fork without even touching it! This activity will lead into reading about and discussing vibration and sound as energy.

✓ LEARNING GOALS:

I can provide evidence that vibrations cause sound, and that sound causes vibrations.

2

JUMP AROUND

WARNING: Be careful with a tuning fork. Never touch it to teeth, glasses, or windows. It can break those things!



✓ PREPARATION AND SUPERVISION

- Help your student do a short hands-on experiment in which they will see the tuning fork make pepper move around on a piece of plastic stretched across a cup.
- They might need help getting the bag to be tight across the cup (this step is crucial for the success of the experiment).

💡 THINK ABOUT IT!

? Question 1: Write or draw what happened with the tuning fork and pepper.

Answer: The tuning fork made the pepper bounce around or glide along on the plastic membrane-like surface.

How to Help: Your student can write this, verbalize it, or draw it.

• If they draw it, they might find it easier to do before-and-after drawings that show the positions of the pepper pieces when looking top-down at the plastic.

? Question 2: You didn't touch the tuning fork to the pepper, so what do you think made the pepper move?

Answer: Your student hasn't learned about energy or vibration yet, so accept any reasonable guess. They might offer an explanation involving pushing the pepper around with the sound.

**? Question 1: Draw a picture of your best string-and-cup-phone design.**

Answer: Their drawing should have at least two cups and a string. Some students might also add a person at each end, or maybe even the attached paper clips.

How to Help:

- *Drawing a picture is like making a model of the system of phones they constructed.*
- *Your student's drawing quality will be affected by both their drawing ability and how well they can translate an actual system to a model on paper.*
- *You can support them by reminding them to draw every piece they see in their design onto their paper.*

? Question 1a: Label the picture with what type of cup and string you used.

Answer: You can have them write this or tell it to you verbally. Answers will vary depending on the materials used.

How to Help:

- *It's important that they recognize what materials worked best because it's an example of the structure of a solution determining how well it functions.*
- *Structure determining function is a common theme in science and engineering, and this is an engaging, hands-on way for them to practice the concept.*

? Question 1b: Write or draw on the picture where a sound, like a whispered message, would start.

Answer: The student should write or draw a person or message going into one of the cups in their drawing.

? Question 1c: Draw arrows or lines to show how sound moves from one cup to the other.

Answer: Their drawing should show sound entering a cup, going down the string, and going out the other cup into a person's ear.

How to Help: This is a way for you to find out if your student understands that sound moves from one place to another.

? Question 2: Explain how vibration helps a friend hear your message in the other cup.

Answer: They might have some or all parts of the complete sequence, which is:

- 1) Vocal cords of Person 1 vibrate (this wasn't mentioned in the student text, but they might make the connection.)
- 2) Person 1 makes a sound (a whisper or talking)
- 3) The sound makes the cup vibrate (a sound wave)
- 4) The cup makes the string vibrate
- 5) The vibrations in the string reach the other cup and make it vibrate
- 6) The vibrations of the cup cause sound that reaches the ear of Person 2
- This will help you determine whether your student understand that vibrations cause sounds and sounds cause vibrations.
- If they're missing a piece, focus on the energy transfer aspect.
- For example, if they say that Person 2 hears a sound but they don't mention the string vibrating, you can say, "Sound is energy. Where did that energy come from? And how did it get from one cup to another?" or point them to the evidence of the string quickly moving back and forth if a loud sound is made on one end.



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