

Sound Motion Detectives

Trace vibrations to explain sound and pitch.

SC.4.P.10.3 "Investigate and explain that sound is produced by vibrating objects and that pitch depends on how fast or slow the object vibrates."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each vibrating object. Circle words that tell how fast it vibrates or whether its sound has a high or low pitch.

Maya's Sound Investigation

- ① During a sound investigation, Maya plucked a rubber band stretched around a box. The band moved back and forth so quickly that her eyes could barely follow it. That motion is called vibration. As the vibrating band pushed and pulled the air, the air carried sound to Maya's ears. When the band stopped moving, the sound stopped too.
- ② Next, Maya gently tapped a metal ruler hanging over the edge of a desk. It made a low sound when a long part of the ruler was free to move. Then she slid more of the ruler onto the desk and tapped again. The shorter free part vibrated faster, and it made a higher sound. Pitch describes how high or low a sound seems.
- ③ To compare pitch, Maya struck two tuning forks, one at a time. A tuning fork with a higher pitch vibrates faster than one with a lower pitch. The faster vibrations make more back-and-forth motions in the same amount of time. Sound needs a vibrating object, but pitch depends on the vibration speed. Slow vibrations produce low-pitched sounds, while fast vibrations produce high-pitched sounds.

2 ANSWER WITH EVIDENCE Use the passage

1 What two observations showed Maya that the rubber band was making the sound?

2 Why did the ruler make a higher sound after Maya made its free part shorter?

3 Compare the two tuning forks. How does the vibration speed of the higher-pitched fork differ from the lower-pitched fork?

4 A vibrating object makes a low-pitched sound. What can you infer about its vibration speed?

3 YOUR TURN Your own words

Choose a safe sound maker not named in the reading, such as a drum. In two panels, draw and label one test that would make it vibrate slowly and one test that would make it vibrate faster. Label the expected pitch in each panel.

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PART 1 • READ AND MARK

Underline each vibrating object. Circle words that tell how fast it vibrates or whether its sound has a high or low pitch. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What two observations showed Maya that the rubber band was making the sound?	The rubber band moved back and forth, and the sound stopped when the band stopped moving.
2	Why did the ruler make a higher sound after Maya made its free part shorter?	The shorter free part vibrated faster, so it made a higher-pitched sound.
3	Compare the two tuning forks. How does the vibration speed of the higher-pitched fork differ from the lower-pitched fork?	The higher-pitched tuning fork vibrates faster than the lower-pitched tuning fork.
4	A vibrating object makes a low-pitched sound. What can you infer about its vibration speed?	It is vibrating slowly.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1: A loose drumhead with motion arrows, labeled “slow vibrations, low pitch.” Panel 2: A tight drumhead with motion arrows, labeled “fast vibrations, high pitch.”

Accept equivalent evidence that sound comes from a vibrating object and that faster vibrations produce higher pitch. For the open task, accept any safe, scientifically reasonable example with both vibration speeds and matching pitch labels.