

# S U M M A R I E S

## **INVESTIGATION 1: Sounds and Vibrations**

In Investigation One, you explored the concept of how a sound is heard. During this Investigation, you:

1. plucked a ruler placed at different lengths and observed the results.
2. observed the results when a tuning fork is activated.

Through these experiments, you found that:

1. the ruler vibrated differently at different lengths.
2. the vibrations of the ruler made a sound.
3. the sound made by the plucked ruler changed when placed at a different length.
4. the activated tuning fork vibrated, which could be felt.
5. the vibrations of the tuning fork made a sound.

## **INVESTIGATION 2: Sound and States of Matter**

In Investigation Two, you explored how sounds travel through the states of matter. During this Investigation, you:

1. activated a tuning fork, held it in the air, and listened to the result.
2. activated a tuning fork, placed its handle on a table, and listened to the result by placing an ear on the table.
3. activated a tuning fork, placed its prongs into water, and listened through a funnel and tubing placed in the water.

Through these experiments, you found that:

1. the vibrations of the tuning fork made a sound that could be heard through the air, water, and table.
2. the vibrations of a sound can move through the three states of matter – gases (air), liquids (water), and solids (table).

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**INVESTIGATION 3: Sound and Volume**

In Investigation Three, you explored volume, a property of a sound. During this Investigation, you:

1. listened to several objects struck with a tuning fork.
2. tapped tubing against a table connected to a funnel held over your ear. To test if the sound could be muffled, a piece of cotton was added into the funnel.
3. listened when a string held tight was plucked. To test if the sound could be amplified, attached funnels to the ends of the string.
4. listened to the volume of a sound when objects are struck together.

Through these experiments, you found that:

1. how loud or soft the volume of a sound is can vary.
2. a sound can be muffled or amplified.
3. the volume of a sound can be changed by changing how hard the objects are hit or rubbed together.

**INVESTIGATION 4: Exploring Pitch and Sound**

In Investigation Four, you explored pitch, a property of a sound. During this Investigation, you:

1. listened to the sounds made by striking a beaker as water was added.
2. blew across the tops of different lengths of straws.
3. plucked rubber bands of different lengths and widths, and tensions.
4. listened to a meter stick plucked at different lengths.

Through these experiments, you found that:

1. As water was added to the beaker, its pitch became higher.
2. The longer straws made a sound lower in pitch.
3. The longer rubber bands made a sound lower in pitch.
4. The wider rubber bands made a sound lower in pitch.
5. The more tightly the rubber band was held, the higher its pitch.
6. As the meter stick became longer, its vibrations became slower and lower in pitch.

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**INVESTIGATION 5: Applying the Properties of Sound**

In Investigation Five, you explored how to apply what you have learned about sound and its properties. During this Investigation, you:

1. observed how to construct a set of drums.
2. tested how to change the volume and pitch of a drum.
3. constructed a musical instrument.

Through these experiments, you found that:

1. volume can be changed by changing how hard the drum was hit.
2. pitch can be changed by changing where the top of the drum was hit.
3. by applying the properties of sound, a musical instrument can be made that changes in volume or pitch or can be muffled or amplified.