



**COMPLETE INTRODUCTION TO PHYSICS**  
**(GRADES 3–5)**

**KT-PHYSELM**

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Science Foundations Series

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## SOUND

**Sound** is energy that moves using vibration. You can hear the leaves rustling in the wind or your parent calling you because vibrations from those actions travel to your ear. The sounds make small bones in your ear vibrate. Those vibrations then travel to your brain which processes them as sound.

These tiny bones are found in the middle ear and called the malleus, incus, and stapes. Sometimes we refer to these bones as the hammer, anvil, and stirrup.

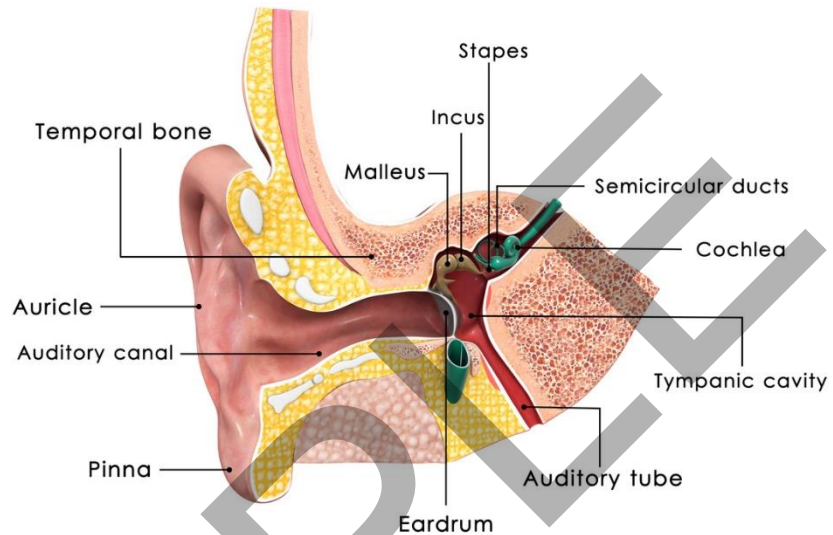


Figure 7. Ear Diagram.

Some sounds are louder than others. Louder sounds have more energy than quieter sounds. If a sound is louder, and has more energy, it can move larger things or move things larger distances. This is why you can hear a louder sound from further away than a quieter sound.

### ACTIVITY #3 - BALL TRAMPOLINE

**FROM THE KIT:** 9-oz cup, medium balloon, steel ball, and tape measure.

**YOU PROVIDE:** Scissors

**NOTE:** Save your ball trampoline for Activities 5 and 6.

1. Cut the neck off of the balloon and discard.
2. Stretch the body of the balloon over the mouth of the cup.
3. Drop the steel ball onto the middle of the balloon from the three heights listed in the table and record your observations in the table on the next page.

## ACTIVITY #8 – RUBBER BAND HELICOPTER

**FROM THE KIT:** Craft stick, rubber band, paper clip, helicopter cutout, 6" plastic propeller with hook and craft stick attachment, and masking tape.

**YOU PROVIDE:** Coloring supplies (optional) and scissors.

1. Insert the craft stick into the attachment on the plastic propeller. Note: It should fit snugly. If not, use a small amount of masking tape to secure it.
2. Slide the paper clip up the exposed end of the craft stick.
3. Tape on longer hook of the paper clip to the craft stick with masking tape, securing it.
4. Hook the rubber band to the unsecured hook of the paper clip and the hook on the propeller.
5. (Optional) Color the helicopter cutout using crayons or colored pencils. Note: Do not use markers or paints as they will make the cardstock too soft.
6. Cut out the helicopter.
7. Tape the helicopter to the craft stick so that the craft stick is two-thirds from the front of the helicopter cabin.
8. Spin the propeller to twist the rubber band. Continue spinning the propeller until the rubber band is double-twisted.
9. Hold the propeller in place and the bottom of the craft stick so the propeller is completely horizontal.
10. Release the propeller and, then one second later, the craft stick.
11. Watch the motion of the helicopter.
12. Repeat Steps 8–11 as many times as necessary to answer the questions below.



Figure 15. Craft Stick Inserted into the Attachment.



Figure 16. Double-Twisted Rubber Band.

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What type of energy does the twisted rubber band have – potential or kinetic? Explain.

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What type of potential or kinetic energy does the twisted rubber band have? Explain.

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<b>Mass on Boat</b>	<b>Speed Observations</b>
0 g	
1 g	
5 g	
10 g	
15 g	
20 g	
25 g	
30 g	
35 g	
40 g	
45 g	
50 g	