

Only Takes A Whisper

Discovering the beauty of India through sound travel

Overview & Purpose

Students have finally completed their travels through India as a team of professionals. Now it is time to communicate and report their findings.

In this lesson, students build a paper cup telephone to investigate the connection between sounds and vibrations. Students will share their findings with their team and will explore sound with their phone creations.

Education Standards

(3.2) Scientific investigation and reasoning

The student is expected to:

(A) plan and implement descriptive investigations including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world;

(B) collect data by observing and measuring using the metric system and recognize differences between observed and measured data.

(3.5) Geography

_____ (A) The student understands the concepts of location, distance, and direction on maps and globes.

(3.6) Force, motion and energy

The student is expected to:

(A) explore different forms of energy, including mechanical, light, sound, and heat/thermal in everyday life.

(3.7) Geometry and measurement

The student applies mathematical process standards to select appropriate units, strategies, and tools to solve problems involving customary and metric measurement.

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Materials Needed

Video (Music for background while students work):

http://bit.ly/SHANTI_MANTRA_India

Paper Cup Telephone Supplies:

Each student will need the following supplies to build a basic paper cup telephone:

- 6 feet of string
- a paper cup
- a paper clip (Use paper clips that are about 1 inch long, NOT jumbo clips. If you have a choice, get coated paper clips like [these \(http://bit.ly/ColorfulPaperClips\)](http://bit.ly/ColorfulPaperClips). You'll be bending the paper clips, and coated ones are easier to bend.)

Students will also have the opportunity to come up with their own experiments with the phone. The list below shows materials they could use. You can get more materials if you like.

- more paper cups, including larger and smaller cups
- construction paper that could be used to make a cup larger
- ribbon, yarn, dental floss, or other kinds of string
- more of the same string you used before
- more paper clips

Handouts:

Each student will need a copy of the Paper Cup Telephone Handout

Heart of India Booklet (from Lesson One)

Teacher Tips Handout (for teacher reference only)

Only Takes A Whisper

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Vocabulary

Energy

Vibrations

Sound

Student Objectives

1. Students will learn about the sounds and sights of India.
2. Students will learn about sound energy & design process.
3. Students will learn about teamwork and working in groups.

Activity

1. *Engage:* Engage students by showing them a quick two minute video on India's rich culture: <http://bit.ly/GuideToIndiaVideo>
 - a. Explain to the team that they will be learning a bit more of India's rich culture by designing their very own method of sound travel.
 - b. Show students the materials and ask for students to share what they think they will be making.
 - c. Group students in teams.
2. *Explore:*
 - a. After grouping students in pairs or small teams, give each team the Paper Cup Telephone handout. Allow time for teams to go through the handout in their teams.
3. *Apply:*
 - a. Have supplies laid out on a table or somewhere where students can have easy access to gather the materials needed.

Only Takes A Whisper

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- b. Students will need to cut a length of yarn/string. Guide them in the process, but allow them to measure and cut. It's part of the learning process and a way to reinforce measurement skills.
 - c. Teams will complete the Paper Cup Telephone Diagram handout together.
4. *Investigate:*
- a. After creating their paper cup telephones, students will **Travel to India**.
 - b. The object is to use the paper cup telephone to share information with the team members on the other end of the phone.
 - c. Each team will be divided into two groups: Voice and Ear.
 - i. "Voice" will guide "Ear" in sharing what they learned about India (refer to Hearts of India booklet).
 - ii. "Voice" will select at least 5 key points from the handout to share to "Ear" via the use of the paper cup telephone.
 - iii. If time permits, they can continue to share other cool facts to each other.
5. *Reflect:*

While students are reflecting on the process, play this video (music) in the background - Sounds of India: http://bit.ly/SHANTI_MANTRA_India

- a. Reflect on the design process, use of materials, and how the team synergized to construct the paper cup telephone.
- b. Reflect on important India facts that were shared. Have each team share at least one cool fact about India that they learned.

Extension

Challenge advanced students to think about ways they could make their Paper Cup Telephone better. What new materials would they use? Long string? Different cups?

