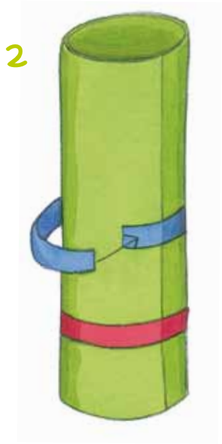
Jumping drum

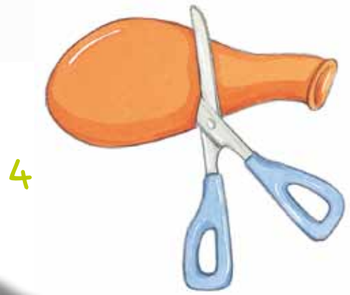
You will need:
- Card
- Stick of glue
- Colored sticky tape
- Two balloons
- Scissors
- A little rice

1 Cut the card the size you want to make the sound tube. Then roll it up, trying to make a perfect circle (about the size of a kitchen towel roll) and secure it with glue.



2 Decorate the tube with colored sticky tape, which will also help it to stick: A clever trick!

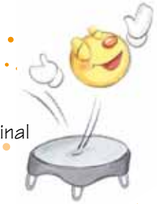
3 Strengthen both ends of the tube with more sticky tape; you could even apply several layers. Stick the tape so that the tube is as strong inside as outside. If you like, you can decorate it with different tapes.



4 Take a balloon and cut it in half, to make a beheaded balloon! In the next step, we will only use the widest part. Do the same with the other balloon.

5 Place one of the balloons over one of the holes in the tube, making a membrane covering the hole. Place the other balloon on the other end, covering both holes well. It is better to ask for help for this part, because it's quite hard to stop them jumping off!

6 Try it out!
Place a little rice on one of the membranes. Warm your hand and hit the bottom membrane up and down. Don't get carried away tapping, otherwise you won't see jumping rice effect.



Why does it happen?

Sound is movement; it is a longitudinal wave. And what does that mean? The vibration produced is always conveyed forwards. When you tap the bottom membrane, the sound is transmitted through the air, as if the air particles were dominoes standing in a row and you make them fall one on the other. Each particle touches the one next to it and transmits the vibration received. The air impact reaches the upper membrane, and by causing it to vibrate, the rice also vibrates and is made to jump.

Traveling sound

You will need:

- Three small bottles or similar containers
- Water
- Flour or sugar
- Lentils or rice
- A spoon
- A funnel (optional)

1 Take the empty bottle and the spoon. First place the bottle near your ear, as if you were making a sandwich between your head and the spoon! Tap the bottle with the spoon to see what happens and what you hear.

2 Now fill this bottle to the top with dried lentils.

3 Place it next to your ear and tap it again with the spoon. Does it sound the same? Now take another bottle and do the same thing, but using the flour. What does it sound now?

4 Fill a third and final bottle with water. Don't drink it yet! Use a funnel to fill it and avoid spilling it on the table. Place the bottle next to your ear and tap it again. Does it sound like the others?

5 Tap the three bottles containing lentils, flour and water one after the other and compare the sound to find out what tone each substance gives. If you want to go a step further, place a bottle next to each ear and gets somebody else to tap them: It sounds like a song!

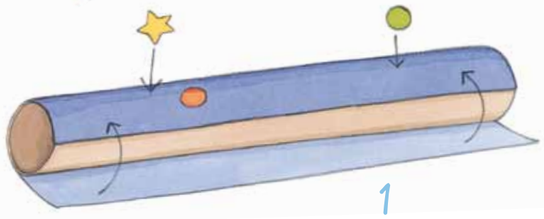
6 Try it out!

Try to fill more bottles with different things you have at home, at school or in the park: Soap, sand and screws... The interesting thing about this experiment is discovering that the bottles sound different depending on what you put inside them. You'll be surprised.

Why does it happen?

They sound different because sound is not transmitted in the same way through all mediums. It passes through water much faster than through air and if there were no air, we wouldn't even be able to hear it, as happens in space. So, **sound needs a medium,** a vehicle **in order to be transmitted** and depending on its qualities, you can hear stronger or weaker. Dolphins and whales communicate over long distances through the water, over dozens of kilometers! Imagine that a friend could hear you over such a great distance!

Rain stick!

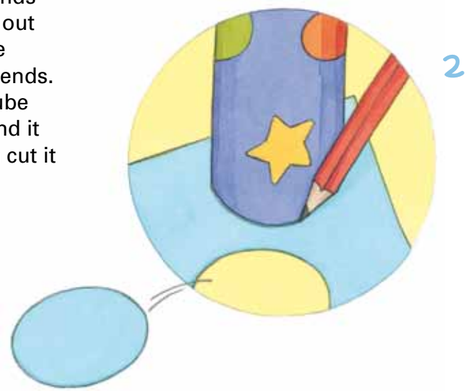


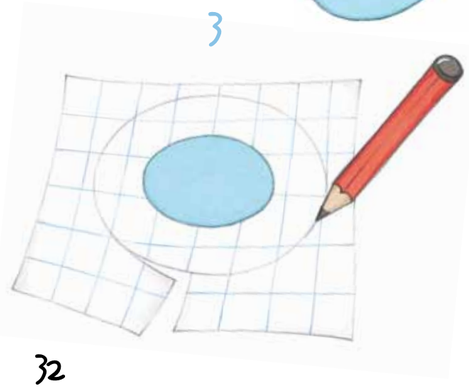
1 Decorate the tube nicely! Cover it with colored paper, securing it with a little sticky tape. You can also use different colored paper, making a collage or add stickers!

You will need:

- A cardboard tube
- Sticky tape
- Scissors
- Piece of card
- Clear adhesive covering
- Rice
- Colored paper
- Elastic bands
- Pencil

2 You must seal the ends of the tube. How? Cut out two circles of card, the same size as the tube ends. It's best to place the tube on the card, draw round it with a pencil and then cut it out. Make two!





3 Place one of the circles on the transparent cover and draw a circle two fingers larger that the card. Cut it out and do the same for the other one. Remove the paper and place the circles in the middle, sticky side up, otherwise you'll stick it to the table!

4 Stick one of the cover circles on one end of the tube to cover the hole. The cover must be stuck around the tube well. So that it holds better, secure it with an elastic band.

5 Turn the tube over and pour some rice in the other end, very carefully! Fill the tube a quarter of the way (half of halfway!). If you don't fill it enough, the rain won't last very long; and the same will happen if you fill it too much! Then cover the other end as before.

Why does it happen?

When heard together, the sound made by each grain of sand as it rolls down the tube is called white noise. **White noise** is the sum of many small sounds of different frequencies. Each grain of rice makes a different sound and when you hear them together a characteristic sound is made. You hear white noise when the rain falls on the leaves or on the ground, at the beach when the waves hit the sand or when the ventilator moves air molecules, etc.

6 Try it out!

Stretch out your arms, tilting the tube downwards, making the rice fall to the other end. What happens? It's started raining! Do the same thing turning it upside down. If you do so at different speeds, you will obtain different intensities of rainfall!