

# Make a Stethoscope

## LESSON PLAN

RECOMMENDED FOR YEARS 3 - 5

### Lesson summary

In this lesson, students make their own stethoscopes to explore their heartbeats and learn about the function of the heart. By the end of this lesson, students will be better at measuring their heart rates and explaining how heart rate is affected by exercise.

### Learning objectives

Students can explain the function of the heart.

Students can measure and interpret how heart rates are affected by exercising.

### Possible Australian Curriculum links

Science Understanding / Biological sciences

Health and Physical Education / Movement and Physical Activity / Understand movement

## STARTER

1. Tell students an organ is a part of the human body that performs a specific function and ask them to list as many organs of the body as they can. Choose a student to lay down on a large sheet of butcher paper and trace over the outline of the student's body. Invite the rest of the class to take turns labelling or drawing different organs on the body outline (e.g. brain, heart, liver, lungs, stomach, kidneys, skin etc).
2. Explain to students we are going to learn about the heart. You may like to show students a model of the heart if you have one or images from the internet. Discuss with students what function the heart has in our body (it makes the blood flow to all the other organs and keep them working). Invite students to place their hand over their hearts and see if they can feel their heartbeat.
3. Discuss with students how sometimes our heart beats slowly and other times it beats faster. Using Think, Pair, Share, ask students to identify examples of a moment or activity that results in their hearts beating quickly (such as when they are nervous or angry, or after doing vigorous exercise) and a moment or activity that makes their heartbeat slow down (for example, when they are resting, relaxing or sleeping). Discuss with students why they think the heart beats faster when they are doing exercise or when they are anxious or angry (the body needs the blood to flow faster to make extra energy. By beating faster, more blood can be delivered).

## Resources

- Large butcher paper – large enough for a child to be traced around

Each pair will need:

- A plastic funnel
- A cardboard tube from a paper towel roll
- Duct tape or other strong tape
- A balloon
- Scissors
- Stopwatch/Timer

## Health and safety

Remind students to use care when cutting with scissors. You may also like to introduce some warm-up and cool-down stretches to students to prepare them for vigorous exercise.



## BODY

1. Explain to students how doctors and nurses use a special instrument called a stethoscope to listen to the noises made inside the body. Ask students to recall and share if they have any experiences of having a stethoscope used on them before on a visit to the doctors or hospital. You could show students images of actual stethoscopes from the internet to aid the discussion.
2. Students will need to work in pairs to create their stethoscopes. To build the stethoscope, ask students to insert the narrow end of the funnel into the cardboard tube and tape them securely together using a strip of duct tape. Cut off the top third of the balloon with scissors and stretch it tightly over the open end of the funnel. If necessary, students may need to use a rubber band or tape to hold it in place. To use the



stethoscope, students need to place the funnel flat on the chest of another student, on the left side roughly where the heart is, and place the end of the cardboard tube against their ear. It may be difficult to hear the heartbeat if the classroom is noisy, so you may wish to ask pairs to spread around the room or to find quiet spaces outside.

3. Ask students to firstly find each other's heartbeats by taking turns using the stethoscope. Ask students to calculate their heart rates by counting the number of beats per 30 seconds (using the stopwatch or timer) and doubling this number. Have students record this on the activity sheet in the table next to 'at rest'.
4. Next, ask students to repeat the experiment, but this time after exercising vigorously (e.g. doing jumping jacks or jogging on the spot) for at least 30 seconds. Remind students that they will need to start the measurements and count their heartbeats instantly after exercising. Ask students to record their results down in the table next to 'exercising'.
5. Ask students to use their calculated heart rate from the table to make a bar graph of their results. Invite pairs to share their findings with the rest of the class. Discuss whether the heart rate stayed the same, increased or decreased with physical activity.

### Question prompts

What is an organ? Can you name some organs in the human body?  
 What is the main function of the heart in the body?  
 What is the main function of blood in the body?  
 How does the heart rate change when you exercise?



## PLENARY

Invite students to share their heart rates for 'at rest' and 'exercising'. Use this information to discuss the variations of heart rates among the class and determine if there are any trends (for example: Are girls' heart rates faster than boys'? Does age make a difference?). Have students calculate the average heart rate for the class, for both 'at rest' and 'exercising'. Ask students to predict whether they think an adult's heart rate is going to be faster or slower than theirs, and why. Test the students' predictions by having them measure their teacher's heart rate or another adult's in school. You may also like to extend this plenary activity by having students measure the heart rates of younger students (e.g. Pre-Primary or Year 1 students) to investigate whether age does make a difference.

## THE SCIENCE BEHIND THE ACTIVITY

A stethoscope is a medical instrument used to listen to sounds produced inside the body. The small disc placed on the body picks up small sounds and amplifies them, by being guided to the listener's ears through an air-filled tube. Stethoscopes are often used to listen to sounds produced by the heart and lungs or of blood flowing in blood vessels. When a doctor listens to your heartbeat with a stethoscope, they are actually listening for two sounds – a longer, low-pitched sound; and a shorter, higher-pitched sound. The lower-pitched sound is caused by the closing of the two heart valves when blood is flowing out of the heart, and the higher-pitched sound is made by the two other valves when blood is flowing into the heart.

When a person exercises or participates in any kind of physical activity, their heart beats faster in order to pump more blood and oxygen to the muscles being used. In this activity, the closing of the heart valves produces a sound that causes the stretched balloon to vibrate. This vibration makes the air in the tube vibrate, which then carries these sound vibrations to your ear.

At the Telethon Kids Institute, our researchers recognise the importance of physical activity for kids and the many health benefits it brings, including developing healthy bones, maintaining a healthy weight and improving cognitive and social-emotional development. [Our Child Physical Activity, Health and Development team](#) works to uncover the best environments, policies and programs to improve children's physical activity levels, health and development to support lifelong health and wellbeing.

[The PLAYCE Policy Project](#) is our flagship three-year project which commenced in 2019. The project aims to develop, implement, and evaluate early childhood education and care (ECEC) specific physical activity related policy and programs. One of the Project's highlights include the [PLAYCE 2 School Study](#), which follows up over 2000 children's physical activity behaviours from early childhood years to now as they commence full time school.

Have you checked out the **Telethon Kids Discovery Centre**? Enrich this lesson with an excursion to our interactive Discovery Centre, full of fun games designed to get kids excited about science, health and research. Check out [our website](#) or [send us an email](#) for more information and to book your next school visit!

# Make a Stethoscope

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Build your stethoscope by placing the funnel into the cardboard tube and securing it with tape. Cut off the top third of the balloon with scissors and stretch it tightly over the open end of the funnel. You may need to secure the balloon with a rubber band or tape to hold it in place.

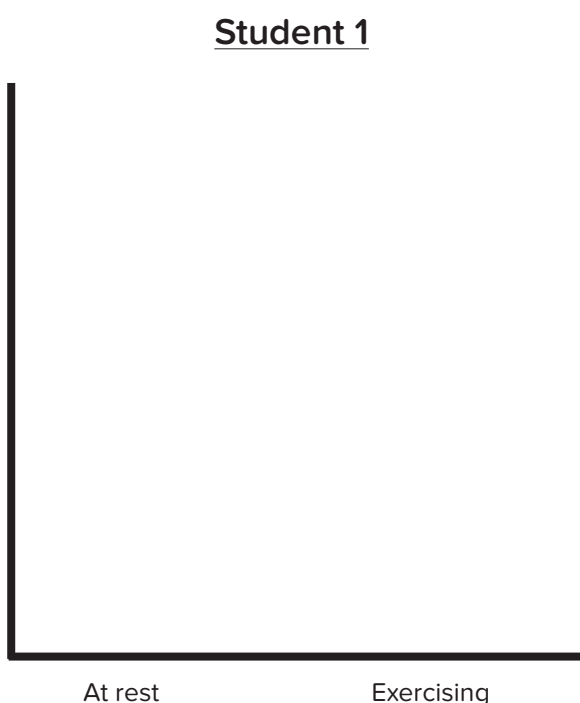
Choose who will be measured first. Use your stethoscope to count the number of heartbeats heard in 30 seconds. Double this number to get your beats per minute (bpm) and record this in the table (decide who will be Student 1 and who will be Student 2).

Activity Level	Student 1	Student 2
	Number of beats per minute (bpm)	
At rest		
Exercising		

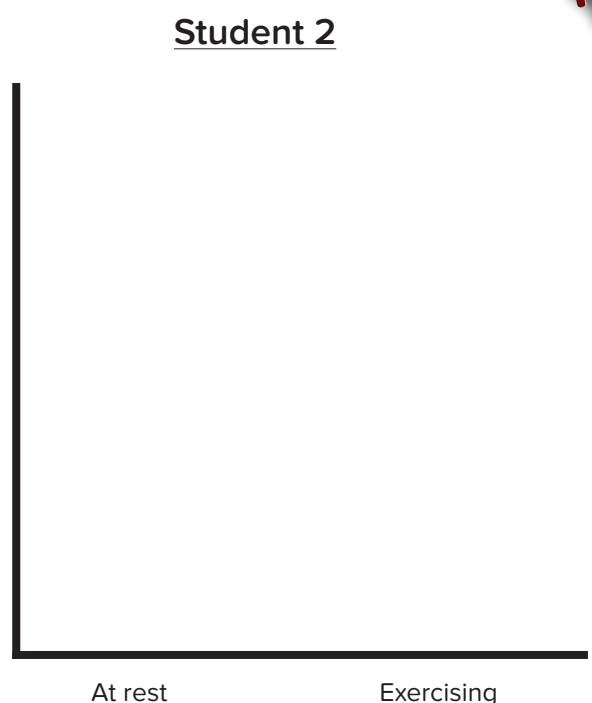


Use the calculated heart rate (in bpm) from the table to create bar graphs on the axes below.

Student 1



Student 2



Which activity level made your heartbeat faster?

At rest

Exercising

What was the difference between your heart rate when you were at rest and when you were exercising (in bpm)?

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