Pulse Experiment

Irish Heart Foundation

Curriculum Links

Maths

Strand: Number **Strand Unit:** Operations

Strand: Data **Strand Unit**: Representing and interpreting data

SPHE – **Strand:** Myself **Strand Unit:** Taking care of my body (Knowing about my body)

Overview

In this lesson, pupils are introduced to the concept of heart rate and the pulse as a way to measure how fast the heart is beating. Pupils are asked to conduct an experiment to measure how physical activity affects the heart rate by learning to take their own pulse on the wrist or neck and measuring it after different intensity activities.

Learning Outcomes

Through this activity, pupils will be able to identify the pulse and measure their heart rate in beats per minute (BPM). Pupils will use this skill to conduct an experiment to investigate the effect of different types of physical activity on heart rate.

Preparation

Read the *Background Knowledge* page and ensure that you are confident in taking the pulse yourself. Finding the pulse can be challenging and takes some practise, so allow plenty of opportunities for pupils to build this skill before doing the experiment.

Teaching Notes

Begin by asking pupils what the heartbeat sounds like and what they know about it. Use the *Background Knowledge* points to introduce the pulse.

Use the *Taking your Pulse* sheet to guide pupils in learning where and how to take the pulse. You could also show this short How to Check Your Pulse video on the Irish Heart Foundation's YouTube page. Practise this over several days before introducing the experiment.

Give each pupil a *Pulse Experiment* sheet and *Record Sheet,* then follow the instructions for the experiment.

A *Graph* template is also provided for each pupil to display their data. The class could also find the average heart rate for the full group for each activity and plot this on the graph.

Further Activity

Discuss how physical activity is good for the heart and task pupils with making a collage of, or drawing, their favourite physical activities.

Measuring Heart Rate

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Background Knowledge

- When we are active, the heart **pumps** faster to help blood move around our bodies more quickly.
- As the heart beats and pumps blood around your body, you can feel a slight throbbing or thumping in some parts where an **artery** (blood vessel carrying blood from the heart around the body) comes close to the surface of your skin.
- This is called your **pulse**.
- Your **pulse** tells you how fast your heart is beating; this is called your **heart rate**.
- The heart rate is measured in **beats per minute**, sometimes shortened to **BPM**.
- There are two main places where the pulse can be felt; the neck and the wrist.

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Taking Your Pulse

There are two main places where the pulse can be felt; the neck and the wrist.

Note: Make sure to use your fingers to take your pulse and not your thumb.

Neck

- Put two fingers of your left hand onto the side of the windpipe in your throat.
- Push down gently and you will find your pulse which feels like a small 'thump' (you can feel it going up and down).
- It can be a bit tricky to find, so you may have to try moving your fingers around to find the right spot.

Or

Wrist

- Using the pointer and middle fingers of your right hand, slide from the base of your left thumb (the squishy part of your palm) to where your hand meets your wrist.
- You might need to move the fingers around until you find the right spot.

- When you have found the pulse, count how many times you feel it while timing 30 seconds.
- Multiply this number by 2 to calculate your heart rate in beats per minute (BPM).

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Pulse Experiment

How does physical activity affect your heart rate?

You will need:

- A stopwatch, timer or clock with a second hand
- A ball (or scrunched up ball of paper) to throw and catch
- Pencil
- Record sheet

Before completing the experiment you will need to have practised taking your pulse on the neck or wrist.

Step 1: Begin by finding your **resting heart rate** by taking your pulse. This is how fast your heart is beating each minute when not doing physical activity. Set a timer for one minute. Sit down and relax, taking slow deep breaths.

Step 2: Then set a timer for **30 seconds** and take your pulse on the wrist or neck. Record this number in the table below and multiply it by 2 to calculate your resting heart rate in beats per minute. .

Step 3: Jog on the spot for 30 seconds. Set your timer and take your pulse again for 30 seconds. Record and calculate beats per minute.

Step 4: Rest for one minute to allow your heart rate to slow down again.

Step 5: Continue doing the activities named on the record sheet for 30 seconds, taking your pulse after each to find BPM. Ensure you take one minute of rest after each time you take your pulse.

Record Sheet

Name of activity	Length of activity	Beats counted in 30 seconds	Heart rate Beats per minute (BPM) *Multiply by 2 to calculate beats in 60 seconds*
Sitting	60 seconds		X 2 = _____ BPM
Jogging on the spot	30 seconds		X 2 = _____ BPM
Throwing and catching a ball	30 seconds		X 2 = _____ BPM
Stretching	30 seconds		X 2 = _____ BPM
Star jumps	30 seconds		X 2 = _____ BPM
Running as fast as possible on the spot	30 seconds		X 2 = _____ BPM

This is your resting heart rate

- Which actions resulted in the highest heart rate?
- Which resulted in the lowest?
- Why do you think this might be?

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Pulse Experiment: Graph

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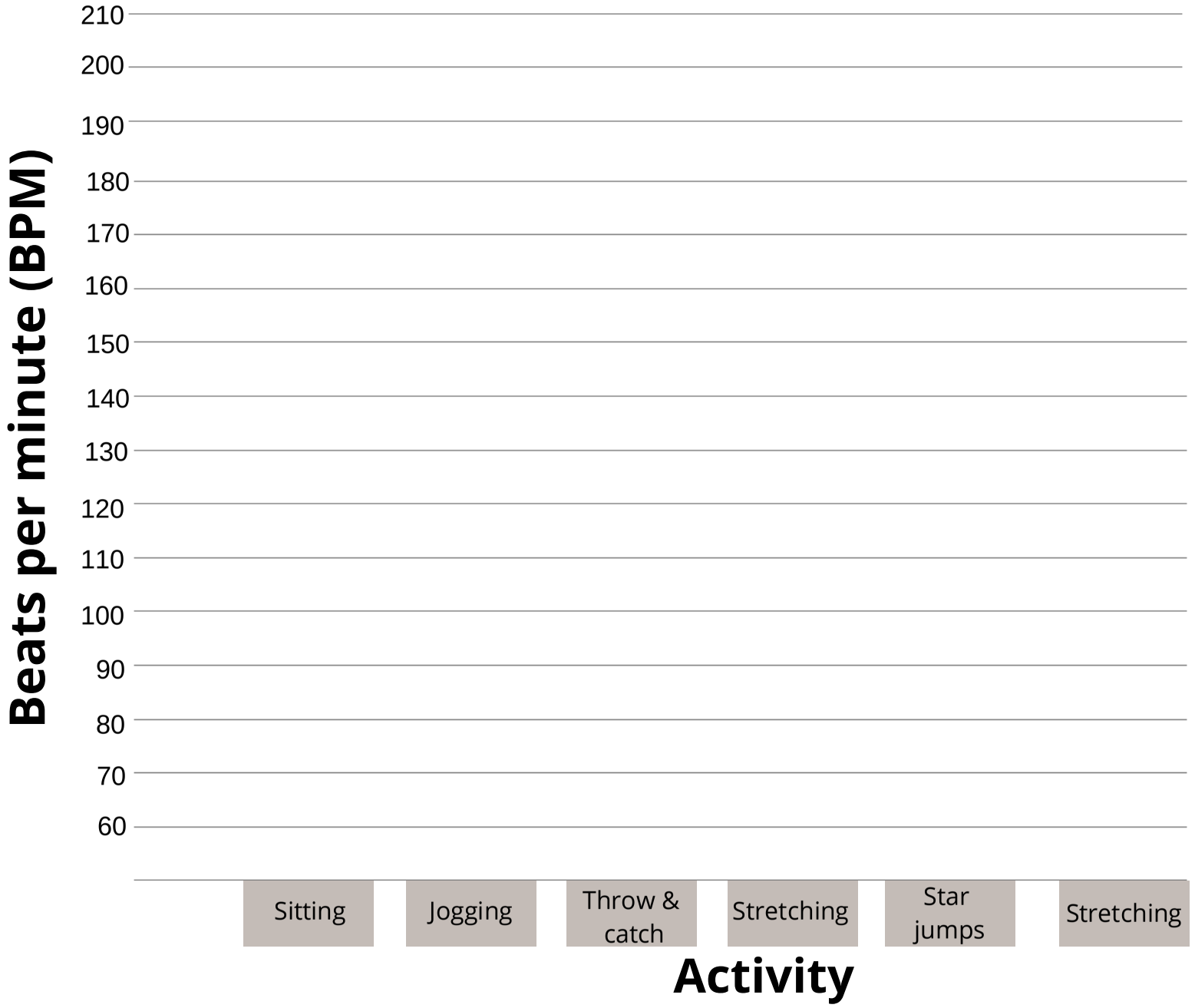
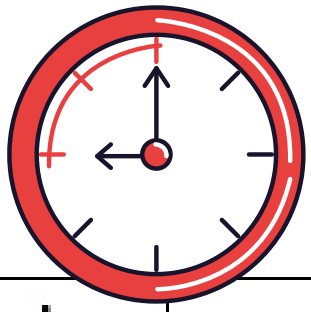


Beats Per Minute Maths

In the above experiment, we timed 30 seconds each time and multiplied by 2 to get the total in 60 seconds.

When taking your pulse, there are many different durations that you can set a timer for and multiply by.

What would you have to multiply each of the following by to calculate beats per minute?



60 seconds	x ___ = 60 seconds
30 seconds	x ___ = 60 seconds
20 seconds	x ___ = 60 seconds
15 seconds	x ___ = 60 seconds
10 seconds	x ___ = 60 seconds
6 seconds	x ___ = 60 seconds

When taking your pulse you could use any of the timings from 6 seconds to 60 seconds, as long as you multiply it by the correct number to convert to minutes.

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