

Staying Healthy

LESSON 5: WB 6.7.20

I CAN PLAN A SCIENTIFIC ENQUIRY

I CAN RECORD, REPORT AND PRESENT RESULTS.

Key Vocab:

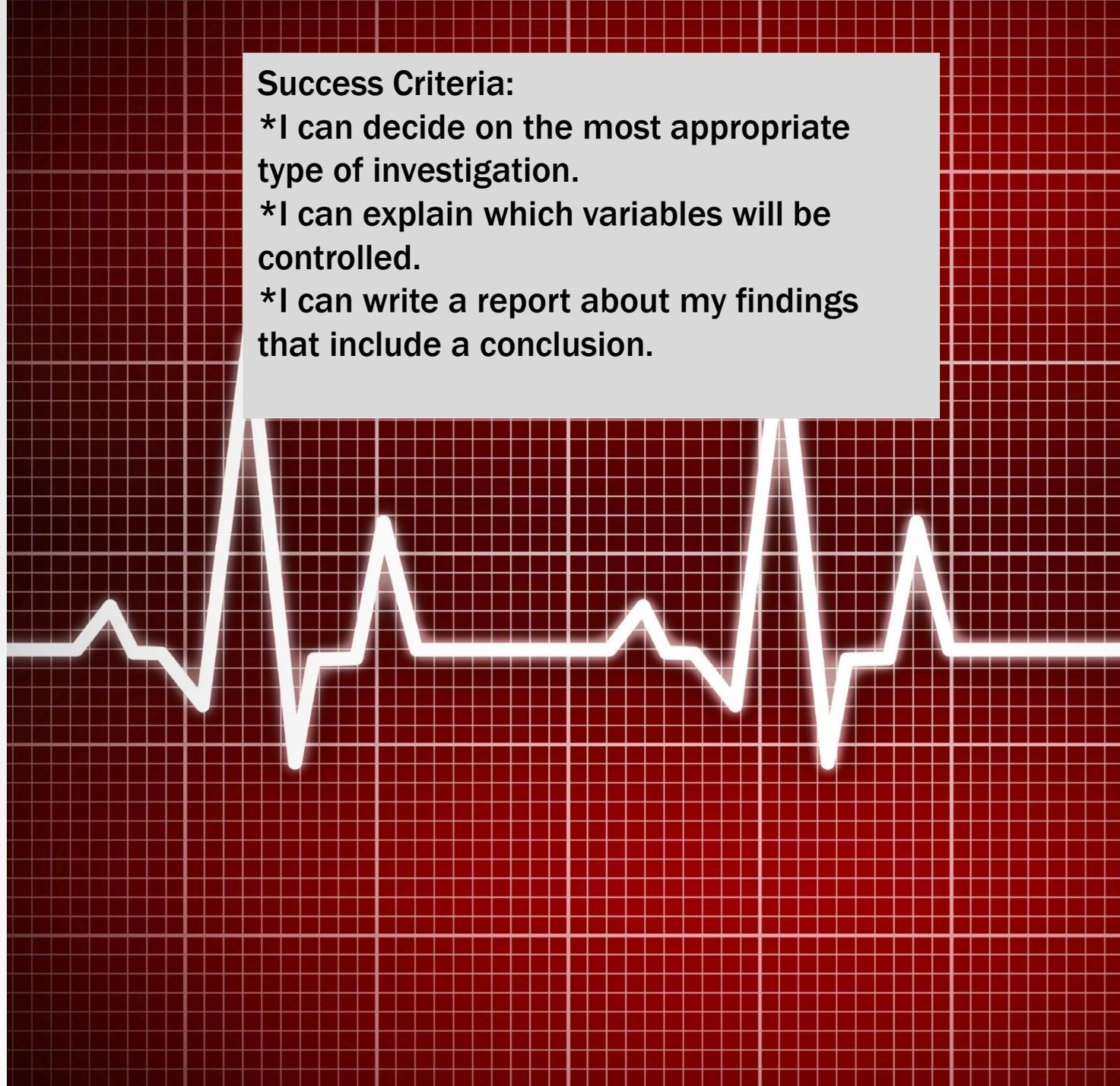
Exercise, fitness, healthy, unhealthy, types, pulse, heart rate, investigation, results, record, table, graph, chart, report, degrees of trust

Success Criteria:

*I can decide on the most appropriate type of investigation.

*I can explain which variables will be controlled.

*I can write a report about my findings that include a conclusion.



Exercise

What Counts?

How much can you recall about what exercise is and the different types of exercises?

Exercise is physical activity that

There are two main types of exercise:



Exercise Investigation

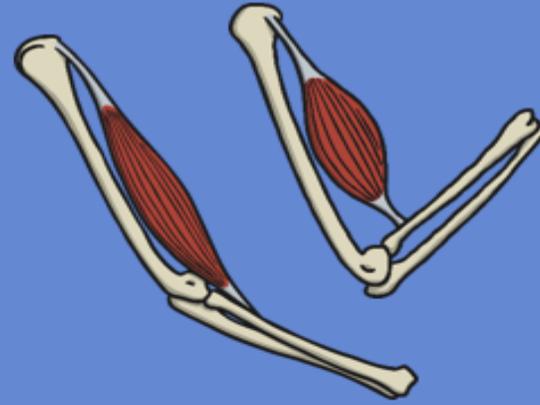
You will be creating an investigation about exercise. Before you start - look at the definition of exercise:



Requires effort



Raises your heart rate



Works your muscles

Of these three, only one, the heart rate, can be measured accurately.

The amount of effort spent on an activity is subjective; it will depend on the activity and will differ from person to person.

While we can use specialist equipment to identify which muscles are being worked during exercise, we can not easily measure how well the muscles are working.

Heart rate, on the other hand, can be easily measured by taking our pulse.

It will be your heart rate we will investigate as this is the type of exercise we can actually measure.

Pulse

You can measure your heartbeat by measuring your pulse. Your pulse is also known as your heart rate. It is the number of times your heart beats in a minute. You can measure it by taking your pulse for a minute, or count for 30 seconds and multiply by 2.

Tips for finding your pulse:

- Use your index and middle fingers to find your pulse.
- Press gently and lightly. If you press too lightly or too firm you will not be able to detect your pulse.
- Do not use your thumb. Your thumb has its own pulse that you may feel which would affect your results.

1. Find your pulse in your neck by pressing your fingers on the side of your neck. This should be the soft hollow next to your windpipe.
2. Find your pulse in your wrist by holding out one of your hands with your palm facing upwards and your elbow slightly bent. Put your fingers on the inside of the wrist at the base of the thumb of the hand facing outwards.



Before you begin your investigation, you will need to take a resting heart rate. Your pulse without any exercise.

Planning Your Investigation

You will need to think of a question to answer and to predict what you think will happen. In order to carry out the investigation you will need to choose which type of investigation is the most appropriate to answer your question.

You could carry out..

a practical enquiry (a simple practical enquiry is one where you just observe what happens)

or

a fair and comparative test

In a fair and comparative test you have to:

- record observations/measurements;
- compare results;
- spot patterns.

You also need to make your test fair by only changing one thing (variable) each time.

Be clear too about which variable you will measure.

To make sure you really are testing the variable that you change each time, all other variables should be kept the same. (These are the variables which are controlled.)

Planning Your Investigation

You need to create an investigation on increasing your heart rate.

What would be your question?

For example:

- Which activate movements increase your heart rate the most?

Use the scientific method to help you along your investigation.



Hypothesis

Scientific Question: What are you going to find out?



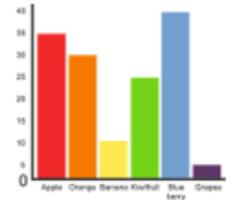
Prediction

What do you think will happen? Why?



Equipment

What will you need to test your hypothesis?



Method (with a diagram)

How are you going to carry out your investigation?



Results

Time it, measure it, observe it. Record what you have found. Use a table, bar chart, line graph?



Conclusion

Look at your hypothesis, what have you discovered? Use your results to support your answer. How could you do it better next time? Did anything surprise you? Why?



Conducting Your Investigation

Think about how you will record your results.

What is the best way to do this?

What categories do you need?

While you conduct your investigation you may need to make changes and adjustments. Make a note of these.

Make sure you take a resting heartbeat! This is one before any exercise has been taken. If you are conducting a fair test this will be your control.

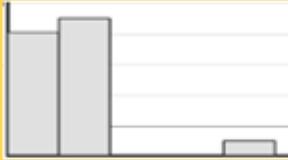
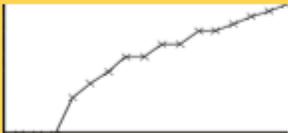
One of the problems with comparing exercises is that, if you do it too soon after the previous activity, the heart rate will already have been increased. This will affect your results. Be sure to leave enough time between exercises for your subject to return to their resting heartbeat.

Repeating the results: Repeating results ensures that your results are more precise. By repeating the investigation you can check if the results were precise the first time around. If the results are very different then it would indicate a problem with how you conducted your investigation.

If you repeat your results you will need to decide how to record this.

Present Findings

Now that you have your results you need to decide how to present them.
There are a number of different ways to show your data using graphs and charts.

Type of graph or chart	Illustration	Uses of the graph or chart
Bar Graph		Uses bars to show how many. Allows for easy comparison between two categories.
Line Graph		Shows changes over time
Scatter Graph		Compares data to see if there is a relationship between the independent and a dependent variable – i.e. a positive or negative correlation.
Pie Chart		Shows both the parts and the whole picture of the data. Used to represent percentages.

Go back to your data and decide which graph is most appropriate for your data.

Degree of Trust

Scientists conduct lots of investigations that have a big impact on living things. For example, scientists conduct investigations that tell us what type of food humans should eat and what chemicals are safe to use on plants.

Because we act on scientific data, we need to make sure that we have a high degree of trust in it before making our conclusions. This is particularly true if we are going to recommend that others act or behave in a particular way based on our results.

How can we ensure there is a high degree of trust in our results?

Degree of Trust

Be **Objective**: have you reported the results honestly? Have you included all the results even when they did not match your prediction? Did you have a control group?

Accuracy: was your measuring equipment accurate?

Reproducibility: can your investigation be repeated? Have you repeated your results? Did you get the same or very similar results?

Consensus: this does not mean that all the data has to show the exact same results, but if the majority of other investigations show results that are the same or very similar then we can have a higher degree of trust in our results. If your results are completely different to all the other datasets for similar investigations, then it is necessary to consider why that is.

Sample Size: this is how many were included in your investigation. The more data you have the more likely it is to show the 'real' picture.

Pick an exercise from your investigation that all the members of your family can do.

What exercise will you be doing? _____

How long for? _____

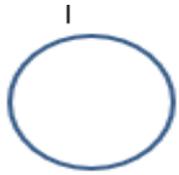
Name of family member	Age	Pulse rate (resting)	Pulse rate (after exercise)

Conclusion:

Add in your family members.

Get your family involved.
How do pulse rates differ?

What if you repeat the exercise 3 different times? Will the rates differ?



Hypothesis

Scientific Question: What are you going to find out?



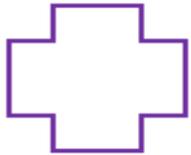
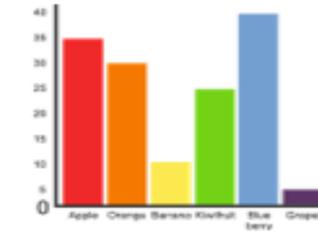
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Reporting Your Findings.
Write your conclusion from your investigation.

Remember: You should be re-testing the results. Not just test once. A good rule is 3 times for each test.