

# Animals – Muscles

Name \_\_\_\_\_

Class \_\_\_\_\_

**What you will need for this lesson:** a tape measure, a piece of chalk or a marker of some kind that won't bow away.  
You will also need a pen, a pencil and if you have it, access to a computer, tablet or iPad.

## LESSON STARTER

Look at the pictures of muscles and bones below. Can you join the right muscles with the right bones? Draw a line to connect them up and If you can name some of them.





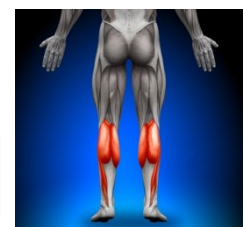










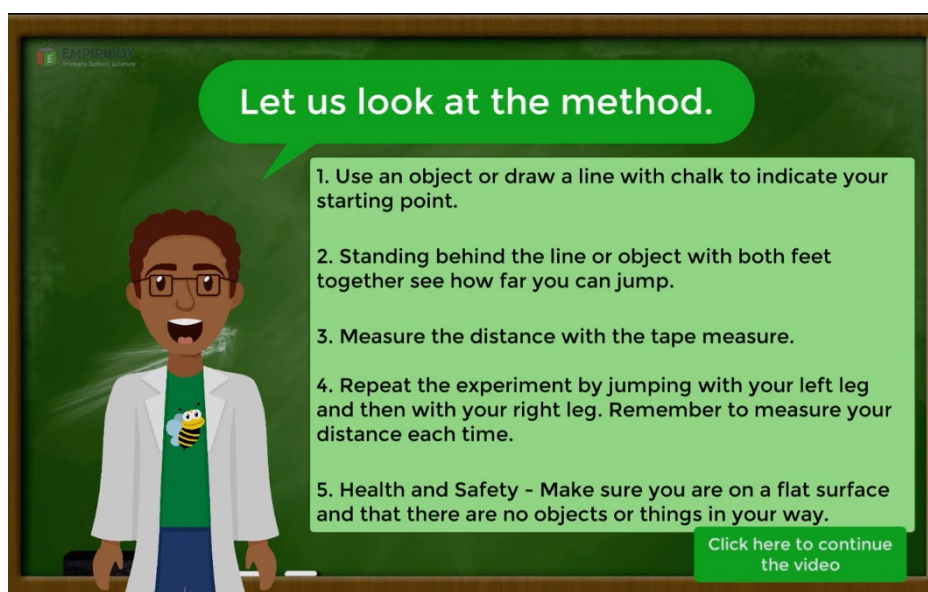


When you've finished, watch the video to see how many you got right.

## The Investigation

### Investigation 1

Set up this investigation now. It might be best to do this investigation outside so please ask an adult if you can go into the garden or if they can take you somewhere where you can jump! Remember to take the tap measure, a piece of paper and a pencil with you to record your jumps!



**Let us look at the method.**

1. Use an object or draw a line with chalk to indicate your starting point.
2. Standing behind the line or object with both feet together see how far you can jump.
3. Measure the distance with the tape measure.
4. Repeat the experiment by jumping with your left leg and then with your right leg. Remember to measure your distance each time.
5. Health and Safety - Make sure you are on a flat surface and that there are no objects or things in your way.

[Click here to continue the video](#)

### Investigation 2

You can do this investigation inside.



**Let us look at the method.**

1. Place the clothes peg between your thumb and index finger.
2. Time yourself to see how many times you can open and close the clothes peg in a minute.
3. Repeat the experiment with your other hand.
4. How does your muscles in your forearm feel after the experiment?
5. Health and Safety - Be careful using the clothes peg as you don't want to trap your fingers or allow the spring to pop out.



What did you notice when you were doing your experiments? Try and think of at least 5 things!

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

### WORKING SCIENTIFICALLY

Our next focus is about working scientifically. All scientists apply these principles whenever they are investigating anything and we've divided them into different skill units.

**Find the section your teacher has asked you to focus on and answer the questions in the relevant section.**

**A. Planning or**

**B. Presenting and analysing data or**

**C. Evaluation**

## A. Planning

Every scientist wants to solve a problem and so takes the following steps

1. **Decides on a question that needs answering.** e.g. Do I jump further if I launch using one leg or two?
2. **Decides what the independent variable (the thing that is changed) might be in order to work out the answer to the question** e.g. I will use one leg then, then the other and then both legs
3. **Decides what the dependent variable might be (how to measure the differences in each different example)** e.g. I will measure how far I jump
4. **Last of all decide what elements have to stay the same in order to make it a fair test** e.g. I will jump from the same place every time

**Now using this knowledge, see if you can answer the questions below!**

**Year 3, 4, 5, and 6 pupils** -What might be the independent variable you would use in your investigation, in other words what would be the things that you would change to investigate your question?

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**Year 3, 4, 5 and 6 pupils** - What would be your dependent variable, in other words what would you measure to record the difference?

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**Year 4, 5 & 6 pupils** -What was your control variable, in other words what did you keep the same to make sure that it was a fair test?

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**Year 5 & 6**, Now design your own question you might want to explore. Make sure you Say what your independent and dependent variables might be.

My question is \_\_\_\_\_

My dependent variable would be\_\_\_\_\_

My independent variable would be\_\_\_\_\_

## B. PRESENTING & ANALYSING DATA

When scientists carry out investigations, it is really important that they capture data to make sure they can then answer the questions that they have set themselves. The scientist on the video has asked you to complete the following:

**Year 3 & 4 pupils – You are carrying out experiments to answer the following question:**

Does the length of my leg affect how far I can jump?

What kind of data would you capture to show what happens and why?

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**Year 5 & 6 pupils – You are carrying out experiments to answer the following question:**

Does using a different finger and thumb to open and close the peg affect how many times I can open and close it in 1 minute?

What kind of data table would you use to show your results? Then fill the table in with your results

## C. EVALUATION

Evaluating how an investigation went as well as the data that comes from a science experiment is a really important part of science. It may be that you feel your experiment could have been done better or more thoroughly and it is important to understand this.

Answer the question below and then explain why you came to this answer:

**Year 3, 4, 5 & 6 pupils:** Did your experiment work?

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**Year 3,4, 5 & 6 pupils:** Why? Try and explain how you know it worked or didn't work. You can draw some diagrams to help you!

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**Year 5 & 6 pupils:** Record the data from your investigation. Can you see any anomalies (strange results)? How did you spot them

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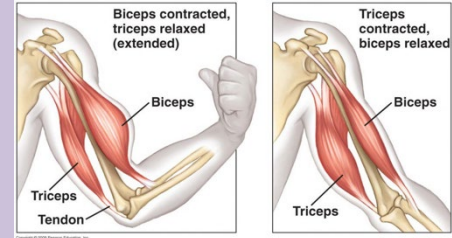
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## The science behind the investigation



Muscles are attached to the ends of bones by things called tendons. Muscles always work in pairs so that one muscle can pull the tendon that joins on to the bone and make it move. This happens when my brain sends a signal to the muscle that I want it to move and so it contracts. When you pull your arm up you can feel the top muscle (the biceps) pulling and getting tighter. At the same

the muscle underneath your arm relaxes and you can feel this muscle feels much softer.

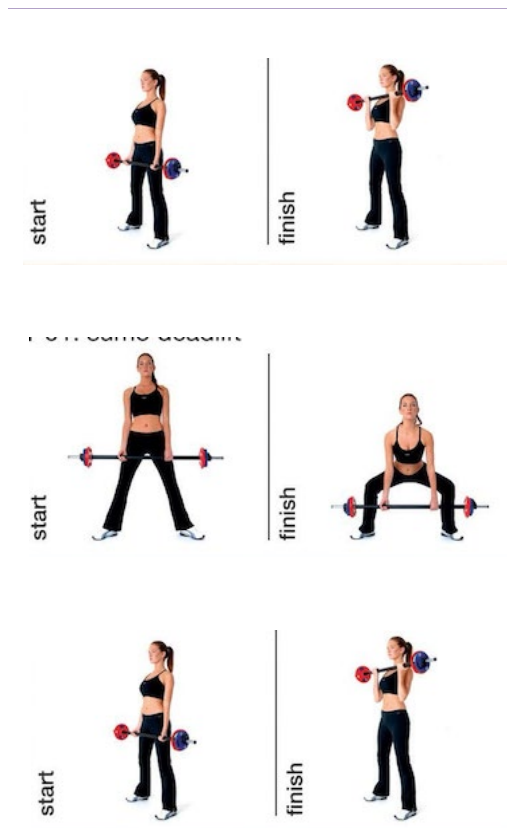


## Your challenge!

In these gym exercises, which muscles are being worked by the fitness instructor?

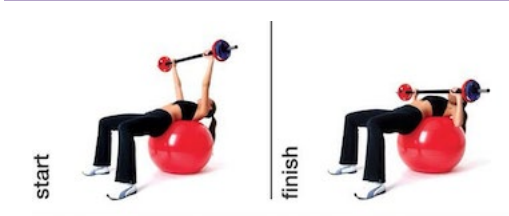
*The exercise*

**Which muscles are being worked?**




Exercise

Which muscles are being worked?



Can you think why sportsmen and women visit physiotherapists? Try and find out!

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## Research opportunity

Find out whatever you can about Pehr Henrik Ling and create a fact file about him.

Where was he born?

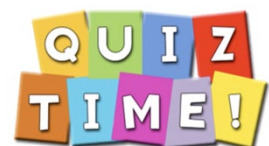
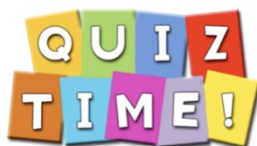
When was he born?

Where did he study?

What important scientific knowledge did he find out and how?



What was your score?



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