



HEIGHT AND FOOT OR SHOE SIZE - A SCIENTIFIC SURVEY

Equipment:

Measuring equipment
(tape measures or non-standard measures), paper.

Suggested Class Level:

3RD – 6TH classes

Preparation:

None

Background information:

The human foot has to do a lot of things. It has to keep you upright and balanced; it has to be strong in order to take all your weight; and it also helps you to walk. It is therefore quite complicated, with lots of bones, joints and muscles.

Trigger questions:

Why do you have feet?! (*For balancing and for walking*)

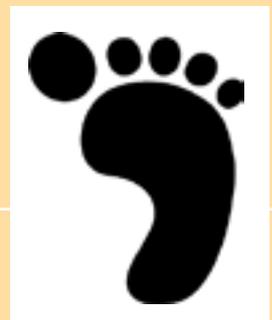
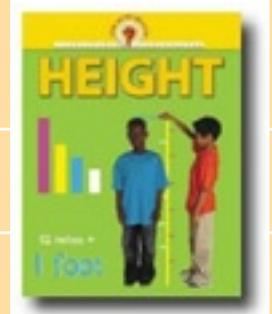
What other part of your body helps you balance? (*Your ear; you can get dizzy and fall over when the liquid in your inner ear moves around; children may also say that holding arms out helps them to balance*).

What do you think would happen to you if you had no feet? (*You could not balance or walk*)

Do you think it is harder for humans to learn to walk than it is for animals? Why? (*Yes, because we only have two legs; it takes us about a year to learn to walk*)

What shape is the sole of your foot, when you look at it from the side? (*An arch*). (*If the children have done the Discover Primary Science activities on making bridges, can they suggest why feet have arches? Does this shape make them stronger?*)

Do you think that taller people have bigger feet than smaller people?
LET'S INVESTIGATE!





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Content Strand:

SCIENCE: Living things: *Ourselves*

MATHS: Number: *Operations – estimate, add, divide*

Measures: *Length, ratios (6th class)*

Data: *Represent and Interpret Data*

Algebra: *Number patterns*

Skills:

Investigating, predicting, measuring, recording

Cross - curricular links:

IT, Art

Science and Maths Activities:

A. ACTIVITY USING SHOE SIZES AND GRAPHS

Some people say that tall people have large feet, and shorter people have smaller feet. Is this true for your class? Carry out an investigation to try to answer this question.

1. Discuss with the children how they would go about answering this question.
2. The children should predict what they think the answer might be.
3. The children could then draw a table like this, with enough rows for the children in their group.

A large chart in the front of the classroom for the whole class might be a good idea.

Name of Pupil	Shoe Size	Height (cm)





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4. The children, in groups, measure their height using a standard method (*to the nearest cm*).

5. They then enter these measurements in the chart beside the name and shoe size of each child.

(This could also be done on a computer spreadsheet if convenient).

Graphs: It is difficult to answer the question “Do taller people have bigger feet?” by looking at the table of results.

It is much easier to see if there is a pattern by drawing a graph.

A scatter graph would be a good way of displaying the results.

The children should then talk about what they did and look carefully at the graph. Do they see any pattern? Can they form any conclusion about the relationship between their height and their shoe sizes?

Did their conclusion fit in with their prediction?

Are there any points that do not fit into the pattern? (Remember that all human beings are unique and come in a variety of shapes and sizes that are normal!).

B. AN ALTERNATIVE ACTIVITY WHICH MEASURES HEIGHT AND FOOT LENGTH

(does not use graphs or shoe sizes - may be suitable for younger classes)

As before the children should discuss how they might go about answering the question “Is there any connection between their height and the length of their feet?”

One method is as follows *(but their own suggestions for different methods should be discussed and perhaps investigated)*:

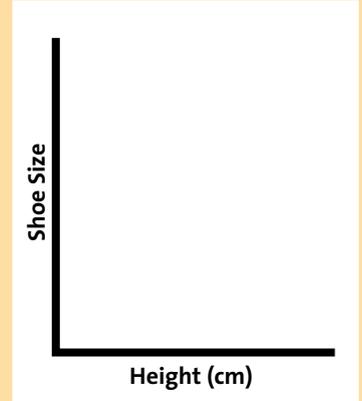
Children measure their height using a standard or non-standard method.

The children take off a shoe and firstly estimate the length of their foot.

They then measure the length of their foot (for fair testing they should all try to measure the same length, e.g. by putting one book in front of the big toe and another behind the heel, and then measuring between the books).

Can they work out how many times they are taller than the length of their foot?

(Hint: They can estimate an answer; and then divide their height by the length of their foot. What number do they get?)



Science Activities:



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Safety:

There are no physical risks with this activity, but teachers should treat this activity sensitively with regard to children who may have heights and/or foot sizes which are fairly different from the rest of the class. Emphasis should be placed on how boring life would be if we were all the same, and on the value of our individual differences.

Follow-up Activities:

1. What is the average size of shoe for the class?
2. Vitruvius, an ancient Roman architect, said that a person's arm span was the same as his height. Children could design an investigation to see if this is true.

First they should predict the result. Then they should discuss how to make this a fair test (e.g. all measurements taken in the same way – arms stretched out at shoulder height).

A table could be made, and a graph drawn, as before.

