

Key Stage 3 Activity

Hula Hoop Challenge

Does height affect the number of hula hoop spins you can produce? Set your pupils this challenge to find out.

Introduction:

- Ask your pupils to generate a suitable hypothesis statement for this challenge.
- Ask them to predict the result and explain why have they predicted this.

What you will need:

- Hula hoop
- Coloured sticky tape
- Tape measure

What to do:

- Attach a small strip of coloured sticky tape to the hoop. This will act as a marker for counting the spins.
- Pupils take turns to hula hoop.

- Count the number of spins each pupil produces, up to a maximum of sixty spins. One spin is measured by the marker on the hoop returning to its start position. For ease of counting, it is recommended that at the start of each attempt the marker is at the front of the hoop.
- Measure the height of each pupil.
- Calculate the average number of spins for each pupil.
- Record your results in a table.
- Create a scattergraph of the results.
- Draw a line of best fit.
- What does the graph show?
- Were your predictions correct?
- Can you explain your results? Do they support the original hypothesis?
- Hula hooping instructions are on the mathcymru website.

Curriculum Links for Challenge and Extension Activities

Skills

Solve mathematical problems

Pupils should be given opportunities to:

- Select, organise and use the mathematics, resources, measuring instruments, units of measure, sequences of operation and methods of computation needed to solve problems.
- Use their knowledge of mathematical relationships and structure to derive facts that they have not yet learned, and to solve numerical problems.
- Use a range of mental, written and calculator computational strategies.

Communicate mathematically

Pupils should be given opportunities to:

- Use a wide range of mathematical language, notation, symbols and conventions to explain and communicate their work to others.
- Generalise and explain patterns and relationships in words and symbols; express simple functions in words and symbolically.
- Read mathematical forms of communication, including tables, diagrams, graphs, mathematical texts and ICT.
- Present work clearly, using diagrams, graphs and symbols.

Reason mathematically

Pupils should be given opportunities to:

- Justify how they arrived at a conclusion to a problem; give solutions in the context of the problem.
- Interpret mathematical information presented in a variety of forms; draw inferences from graphs, diagrams and statistics.
- Explain, follow and compare lines of mathematical argument; appreciate the difference between mathematical explanation and experimental evidence.
- Evaluate results by relating them to an initial question or problem.

Range

Handling data

Pupils should be given opportunities to:

- Begin to develop an understanding of bias and reliability.
- Construct appropriate diagrams and graphs to represent discrete and continuous data, including bar charts, line graphs, pie charts, frequency polygons and scattergraphs.
- Interpret information given in a wide range of graphs, diagrams and statistics, especially real-life data.
- Compare sets of data and their distributions, including methods that involve correlation and lines of best fit.

Key Stage 3 Activity

Extension Activity 1: Diameter of Body Part

Experiment with spinning the hula hoop around different body parts. Does this affect the number of spins you can produce? Carry out this investigation to find out.

Introduction:

- Devise a suitable hypothesis statement for this investigation.
- Predict the result and explain why you have predicted this.

What you will need:

- Hula hoop
- Coloured sticky tape
- Measuring tape

What to do:

- How can you ensure the results will be reliable and valid?
- Attach a small strip of the coloured sticky tape to the hoop. This will act as a marker for counting the spins.
- Pupils take turns to hula hoop on their arm, their leg and around their waist.

- Count the number of spins each pupil produces for each body part, up to a maximum of sixty spins. One spin is measured by the marker on the hoop returning to its start position. For ease of counting, it is recommended that the marker is at the front of the hoop at the start of each attempt.
- Measure the diameter of each pupils' arm, leg and waist.
- Record the results in a table.
- Calculate the average number of spins for each body part.
- Create a bar graph of the results.
- What does the graph show?
- Were your predictions correct?
- Can you explain your results? Do they support the original hypothesis?
- Can you think of any improvements for this test?
- Explain how you would carry out a follow-up study to investigate this further.

Extension Activity 2: Number of Hoops

Experiment with spinning more than one hula hoop simultaneously. What is the maximum number you can spin? Is this related to height? Carry out this investigation to find out.

Introduction:

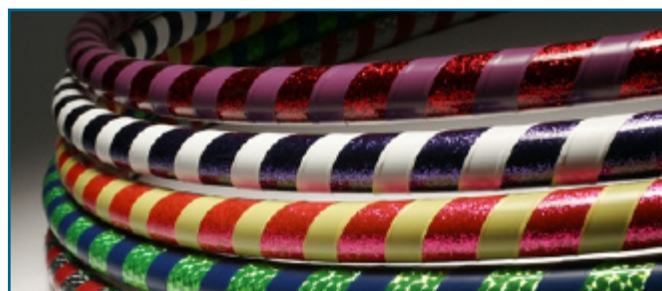
- Devise a suitable hypothesis statement for this investigation.
- Predict the result and explain why you have predicted this.

What you will need:

- Hula hoop
- Measuring tape

What to do:

- How can you ensure the results will be reliable and valid?
- Pupils take turns to spin as many hoops as possible simultaneously around their waist. Pupils should produce three complete spins with the hoops for it to be valid.
- Measure the height of each pupil.



- Record the results in a table.
- Create a scattergraph of the results.
- Draw a line of best fit.
- What does the graph show?
- Were your predictions correct?
- Can you explain your results? Do they support the original hypothesis?
- Can you think of any improvements for this test?
- Explain how you would carry out a follow-up study to investigate this further.