Gumboot Games

You need: scales, a long measuring tape, a collection of objects for throwing, a calculator, 3 or 4 classmates

ACTIVITY ONE

At the Taihape gumboot-throwing competition, the eight finalists throw the following distances:

Name	Distance
Carey	47.82 m
Mere	4 821 cm
Matiu	48.62 m
Mark	48 098 mm
Simone	4 216 cm
Jackson	48.39 m
David	4 639 cm
Beth	46 582 mm

1. Put the finalists in order from the longest throw to the shortest.

2. The "official" gumboot holds 3.12 litres of water.
   a. Find the volume of the water in the gumboot in cubic centimetres (cm^3).
   b. Find the mass of the water in the gumboot in both grams and kilograms.

1 cubic centimetre has a capacity of 1 millilitre.
1 millilitre of water has a mass of 1 gram.

3. In the children's competition, the winner gets the equivalent of a gumbootful of soft drink for every complete 2 metres thrown. Tim's winning throw is 18.42 metres. How many 1.5 litre bottles of soft drink should he get? (The organisers will round up the litres to give him full bottles.)

ACTIVITY TWO

Kahu has an idea for a new event. You can throw anything you want as long as it isn't an object intended for spinning, like a discus or a flying disc.

The object gets weighed and then thrown. The distance you throw your object is divided by its mass. This gives you metres thrown per gram. The winner is the person who throws the greatest distance per gram. Kahu tries out his idea, getting a friend to throw these objects. He records the results:

Object	Mass (g)	Distance (m)	Rate (distance ÷ mass)
Gumboot	750 g	46.89	
Brick	2 250 g	36.43	
Cricket ball	155 g	98.5	
Cowpat	234 g	74.39	
Rolling pin	850 g	42.64	

1. **a.** Predict which of Kahu's objects will go furthest per gram.
   b. Calculate the distance per gram for each object.
   c. Per gram, which object was thrown furthest?
   d. Write a sentence that tells what generally happens to the distance/mass ratio as the mass of the object changes.

2. **a.** Working in a group with 3 or 4 classmates, find several objects to throw and then weigh them. With your teacher's permission, find an empty part of the field and get your classmates to throw each item. Measure and record the length of each throw.
   b. Work out the distance per gram rate for each of your objects. Do your results fit with what you wrote in question **1d**? Explain.

INVESTIGATION

Why is it easy to throw a small, heavy object like a stone or lead sinker a long way, while it is difficult to throw something light like a feather, a piece of polystyrene foam, or a piece of paper?