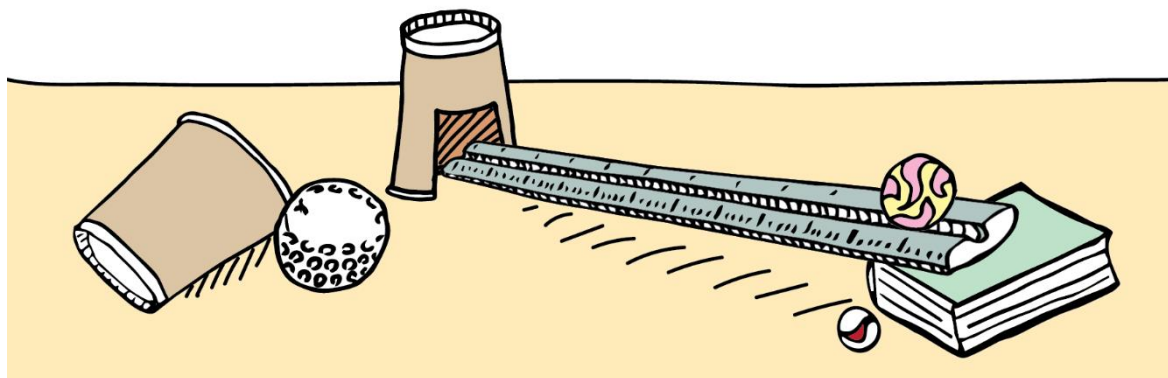


ADDING “OOMPH”

Science in motion | Colossal Collisions | Activity B4



CHALLENGE

Using the materials provided, work out how far a paper cup moves when things of different weight crash into it.

Cut a 5cm square hole in the paper cup.

Place one end of the grooved ramp on a thick book and the other end resting on the desk (or floor if you're doing this all on the floor). It needs to be on a smooth surface.

Place the cut-open side of the cup at the bottom of the ramp.

Mark where either the front or the back of the cup is.

Hold a normal marble in the groove at the top of the ramp.

Release the marble and observe how far the cup moves.

- Use the ruler to measure that distance (as accurately as you can) and record it on the results chart below.
- Repeat this marble roll 3 times and record the distance moved each time.
- Now do the same test for the large marble, 3 times, and record your measurements.
- Now use the golf ball and record your measurements.

Things you'll need

One metre ruler with a centre groove, to use as a ramp, per group

OR, 2 rulers held together with blu tack to make a centre groove, per group

Books to support the ramp

Paper cup

One normal marble, one large marble and one golf ball per group

Another ruler to measure how far the cup moves

Another option is you can just use more and more normal sized marbles in a row, so long as they are touching and are all released together.

Results chart

Marble type	Distance the cup moves (in cm)			Average distance the cup moves (in cm)
	Trial 1	Trial 2	Trial 3	
Normal marble				
Large marble				
Golf ball				

Things to think about and discuss

Have you released the marble from the same position each time? Why is this important?

Are you measuring from the same position each time? Why is this important?

What might it mean if you haven't done this?

Can you see a pattern or relationship emerging between how fast something is moving and the mass of the moving object?

Recording Findings

Add the observations and findings of this investigation to the chart you started with the Bang activity.

Do these findings help us answer the big question?

Do they add evidence that our ideas are correct or bring up something new that needs to be considered?

WHAT HAPPENS WHEN MARBLES CRASH?			
Activity	Observations / Patterns	What do we think was the cause of this observation or pattern?	How does this help us answer the big question?
Bang!	Already filled out		
Straight line impacts	Already filled out		
Adding "Oomph"			

Connecting

Thin back to our story about Wiremu and Daisy. On another day they were biking in their local park.

They made a circuit that went between some trees and over several gnarly old tree roots that spread out across the ground, through the rockery, out onto the grass and in between some families having a picnic and then back to the trees. It was fun.

As they went, they started wondering what they would do if they had to make an emergency stop. They had been doing some investigations in class into what happens when marbles crash into each other.

Could they use their work in class to help make a decision about what would be less harmful to crash into?

Based on all the activities in Colossal Collisions, if they really did have to crash... what will it be less harmful to crash into and why? A tree, tree roots, rocks, a picnic basket?

Use the evidence of your recent activities to back up your answer.

Write your answer on the **Claim / Evidence / Reasoning** form below.

Use all the vocabulary words on the wall and your 'What happens when the marbles crash' chart to help you answer.

CLAIM / EVIDENCE / REASONING

What should Wiremu or Daisy do?

CLAIM: I think it would be best for Wiremu or Daisy to

.....

EVIDENCE: When we did the activity and the
..... activity we noticed that:

.....

.....

.....

.....

.....

REASONING: This means that if Wiremu or Kowhai had to crash they are best to -

.....

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Teacher support material

For further activities and curriculum support:

[Science in motion \(Waka Kotahi Education Portal\)](#)