



student activity



Name: _____

Teacher: _____

School: _____

Science Education Program

It's your turn to get caught in a speed trap, and the faster you're travelling, the better! Use a radar gun to clock the speed of your friends as they scream out of The Blue Ringed Octopus at up to 50 kilometres per hour. But does the greatest top speed mean that they will finish first? In this activity you will compare top speeds with average speeds and discover that friction can be quite a drag in your quest for speed!

Syllabus Outcomes

Years 6 and 7

Energy and Change 4.1 Students design and perform investigations into relationships between forces, motion and energy.

Years 8 and 9

Energy and Change 5.1 Students analyse situations where various forces (including balanced and unbalanced forces) act on objects.

Year 10

Energy and Change 6.1 Students use scientific ideas of motion (including action and reaction) to explain everyday experiences.

Equipment

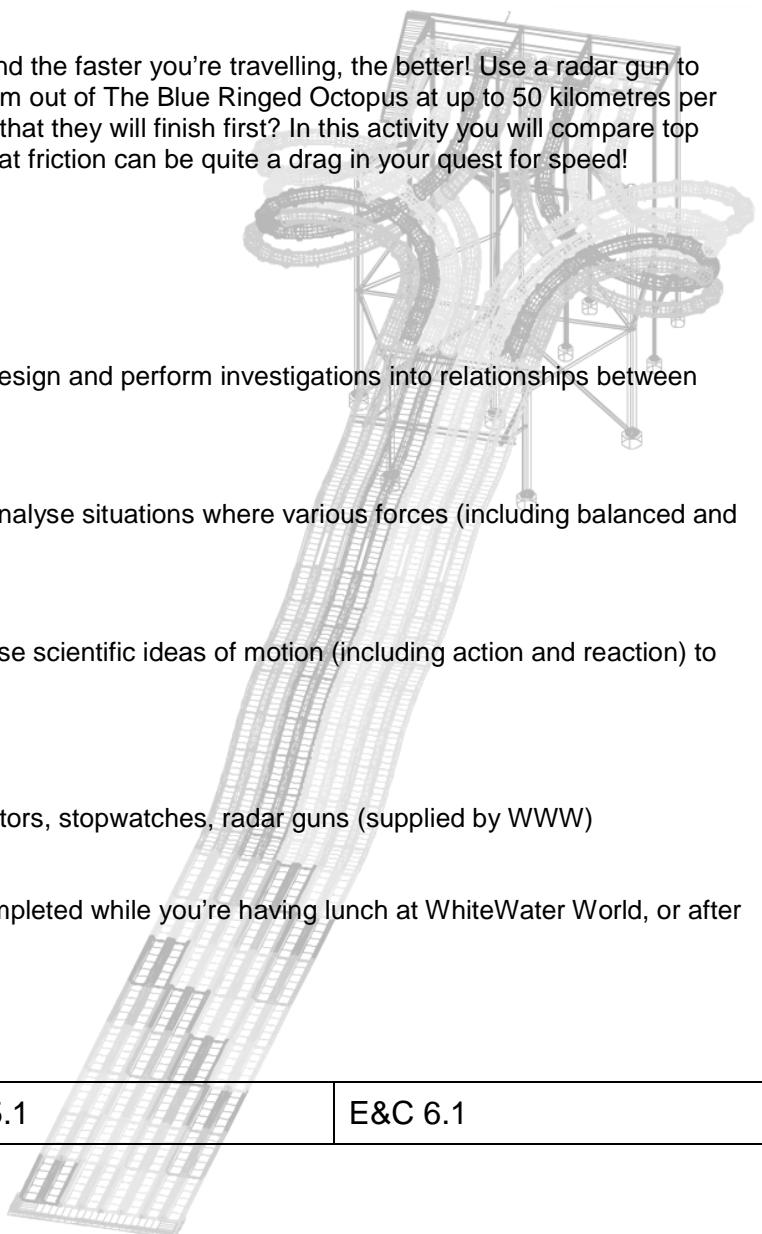
Student activity sheets, pens/pencils, calculators, stopwatches, radar guns (supplied by WWW)



Activities with this symbol may be completed while you're having lunch at WhiteWater World, or after you leave WhiteWater World.

Standard Achieved

E&C 4.1	E&C 5.1	E&C 6.1
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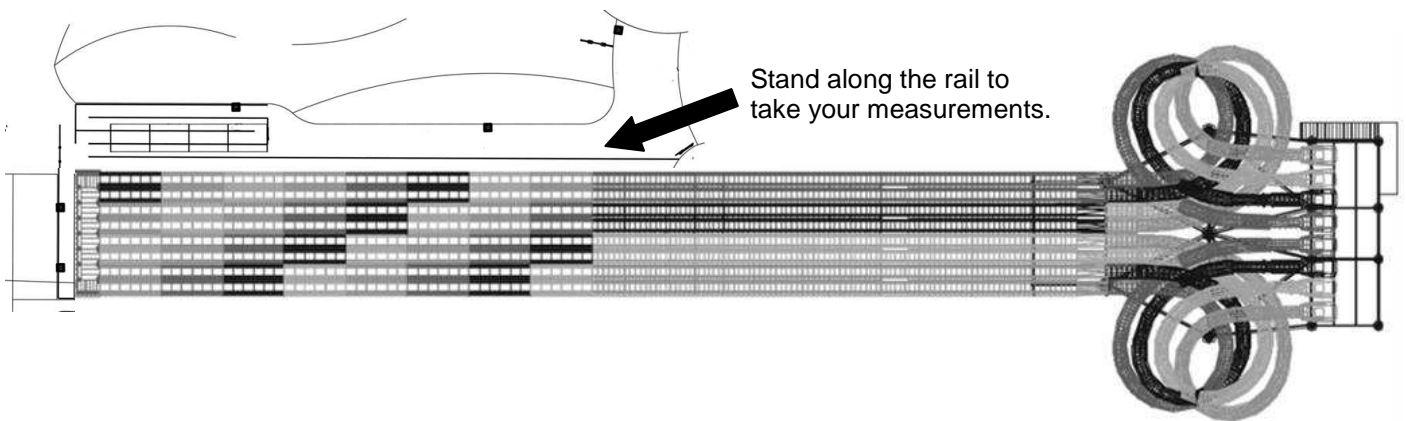
Average Speed

Your goal on the Blue Ringed Octopus is to scream out of the tube the fastest and beat your friends to the bottom! But how fast can you go?

You can work out the average speed of a rider if you know how far they've travelled and how long it took them to get there.

Most riders on the Blue Ringed Octopus will cover a distance of 100m, so all you need to do to work out their average speed is to measure their time.

The best place to do this from is along the rail alongside the track. Stand close to the rail so you're not in the way of people using the path.



Question 1 (Level 4 Outcome)

To time a rider, you'll need to position a friend at the top of the Blue Ringed Octopus to give you the signal as soon as the race starts. Stop your stopwatch as soon as the person you are timing comes to a dead stop at the bottom.

Time = _____ s

Question 2 (Level 4 Outcome)

The speed of the rider can be found by dividing the distance by the time. Put the time you measured in Question 1 in the space below and use your calculator to measure the speed.

$$Speed = \frac{Distance(m)}{Time(s)} = \frac{100m}{\quad\quad\quad s} = \quad\quad\quad m/s$$

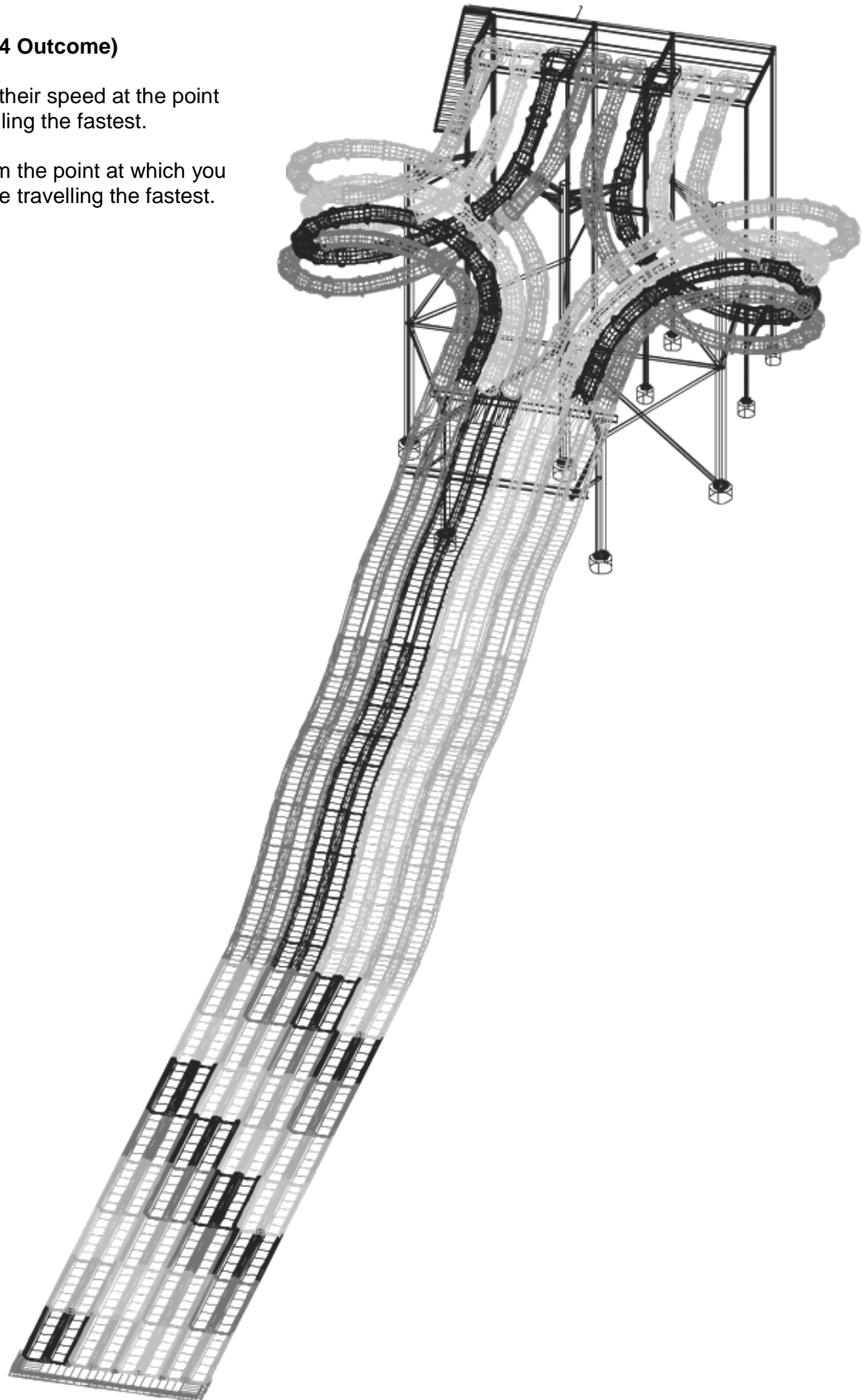
Instantaneous Speed

Instantaneous Speed is the speed of the rider at a particular instant. This is very difficult to calculate, but can be measured easily using a radar gun.

Question 3 (Level 4 Outcome)

We're interested in their speed at the point where they're travelling the fastest.

Mark on the diagram the point at which you predict a rider will be travelling the fastest.



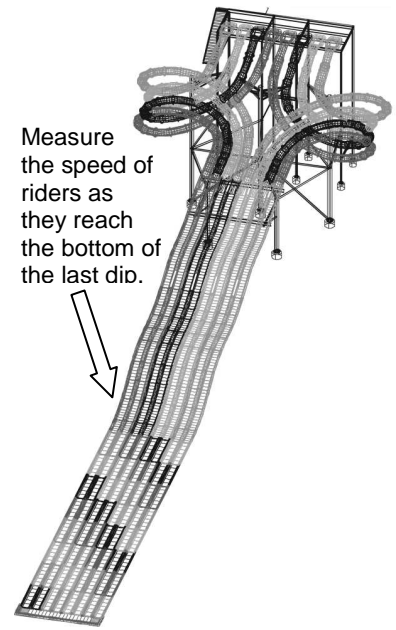
If your answer to Question 3 was at the bottom of the last dip, you'd be spot on, and this is where you will measure the speed of your friends as they come down the Blue Ringed Octopus.


Question 4 (Level 4 Outcome)

Use the radar gun to measure the speed of your friends as they reach the last dip on the Blue Ringed Octopus.


Record their speeds in the table below.

Name	Speed (km/h)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



 **Question 5 (Level 5 Outcome)**

Water between the mat and the track is an essential ingredient for speed on the Blue Ringed Octopus. Explain how water reduces friction.

 **Question 6 (Level 5 Outcome)**

Explain what brings a rider to a stop at the bottom of the Blue Ringed Octopus.
