

Motion & Force at Robin Hill

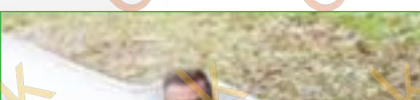
Describing force and motion at the park!

Student Introduction

- ▶ Motion, acceleration and velocity can be measured all around Robin Hill Country Park!
- ▶ What can you discover about your own and others' velocity and acceleration capabilities?

TASK

- ✓ Enjoy the different activities at Robin Hill.
- ✓ Complete the tasks on the following pages.



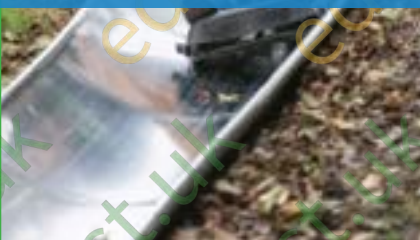
ACCELERATION

Teaching resources by Education Destination Ltd.

Curriculum relevant materials supporting school trips to the Isle of Wight

Book today with Education Destination and get full access to this and hundreds more quality resources

www.edudest.uk



Background

- » As you slide down the toboggan run your speed will increase, you will accelerate.
- » **Acceleration** is the rate at which you change speed.
- » To calculate acceleration you use the formula:

$$\text{Acceleration (m/s}^2\text{)} = \text{change in velocity (m/s)} \div \text{time taken for the change (s)}$$

STEP 1 Practise your calculations.

- » Chris was stationary at the top of the toboggan run.
- » His velocity at the end of the toboggan run was 8 m/s
- » It took Chris 40 seconds to travel down the toboggan run from the top of the hill.

What was his acceleration?

$$\text{acceleration (m/s}^2\text{)} = \text{change in velocity (m/s)} \div \text{time taken for the change (s)}$$

$$\text{acceleration} = 8 \div 40$$

$$\text{acceleration} = \mathbf{0.2 \text{ m/s}^2}$$



It took Jessie 30 seconds to travel down the toboggan run. She was stationary at the top of the toboggan run and her velocity was 10 m/s at the end. Calculate her acceleration.

**STEP
2**

105092

The table below shows information about some of the activities found at Robin Hill. Use this information to **calculate the acceleration** of the different objects

Activity	Velocity at start (m/s)	Velocity at end (m/s)	Time taken (s)	Calculation: Acceleration = $\frac{\text{change in velocity}}{\text{time taken for change}}$	Acceleration m/s ²
Colossus	0	15	5		
Cows Express Children's Train Ride	0	3	60		
Cheetah Zip Wire	0	8	4		
Falconry Display	0.5	86	1		

Teaching resources by Education Destination Ltd.

Curriculum relevant materials supporting school trips to the Isle of Wight

Book today with Education Destination and get full access to this and hundreds more quality resources

www.edudest.uk

**STEP
3**

You can change the formula around to find a different value:

Time taken for change = change in velocity ÷ acceleration

The toboggan was stationary at the top of the hill and reached a maximum velocity of 15 m/s. The acceleration for this toboggan ride was 0.5 m/s²

What would be the time taken to travel down the toboggan run?

Show your working out. Don't forget to include the units.



Teaching resources by Education Destination Ltd.

Curriculum relevant materials supporting school trips to the Isle of Wight

Book today with Education Destination and get full access to this and hundreds more quality resources

www.edudest.uk

The complete journey of the toboggan run can be represented by this velocity-time graph.

Add these labels to the velocity-time graph above:

1. *Accelerating at the start.*
2. *Moving at a constant velocity up the hill.*
3. *Slowing down at the top of the hill for a few seconds.*
4. *Accelerating down the hill.*
5. *Decelerating to a stop back at the bottom of the hill.*

