

TEACHER NOTES

Science: Physics

Motion & Force

Contextual Summary

This resource is for students at key stage 3 and relates to the 'Motion and Forces' part of the Science National Curriculum, focusing on force diagrams and the quantitative relationship between average speed, distance and time.

The tasks link to various activities at Robin Hill, specifically to the Toboggan Run.

Tasks are designed to appeal to students at key stage 3 working at lower, medium or higher abilities.



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ROBIN HILL
COUNTRY PARK

SUBJECT

Science: Physics

UNIT

Motion & Force

OPPORTUNITIES FOR USE

- ✗ Pre-Visit
- ✓ On-Site Activity
- ✗ Post-Visit



Peripheral Task

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Students complete a 'Force Diagrams' worksheet at www.edudest.uk

experiences of the various activities. Students will also collect data and use this to calculate the average speed of the Toboggan Run.

Some students can then apply their knowledge of the Toboggan Run to complete a distance-time graph.

Ideally, teachers will have introduced students to the effects of forces and the methods of describing motion.

The post-visit aspects of the task enable students to work together to investigate how the design of a toboggan will affect its average speed.

Ability Levels

This resource is suitable for students in key stage 3.

There are 3 variants of the resource: one resource for lower ability students, one for medium ability students and one resource for higher ability students.

Teachers could adapt the content for students' needs by simplifying instructions where appropriate, or adding more complex tasks.

Key skills practised in this unit:

- ▶ Drawing force diagrams
- ▶ Carrying out calculations
- ▶ Transposing formula
- ▶ Application of knowledge
- ▶ Manipulating data into a graphical form
- ▶ Working scientifically
- ▶ Recording and using data



S1-S3

CURRICULUM / SYLLABUS

- ✓ National Curriculum 2014
- ✓ Curriculum for Excellence

Applies to Resources numbered:

1	0	5	1	0	1
1	0	5	1	0	2
1	0	5	1	0	3

Relationship to Curriculum

The above skills are required to be taught and practised as per the National Curriculum, for key stage 3 Science, and the Curriculum for Excellence.

Learning Opportunities

Pre-Visit

- ▶ It is suggested to teachers that students be introduced to the effects of forces and the methods of describing motion prior to the trip.

During the Visit

- ▶ Students complete the Science resource/s linked to this document: *Motion & Force at Robin Hill!*

Resource ID: [105101](#) (KS3 low ability) [105102](#) (KS3 mid ability)

[105103](#) (KS3 high ability)

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Enrichment Opportunities

- ▶ Opportunities exist for students to gain valuable practice in the area of working scientifically.
- ▶ Particular attention can be made to the need for accuracy and repeatability to produce reliable results.
- ▶ Students will need to identify independent, dependent and control variables.

Learning Outcomes

- ✓ Students will draw force diagrams to represent balanced and unbalanced forces.
- ✓ They will use the equation **speed = distance ÷ time** to carry out their calculations.
- ✓ Some students will apply their knowledge to complete distance-time graphs.

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