

TEACHER NOTES

Transferring Energy

Contextual Summary

This resource is for key stage 4 students who are covering forces and energy as part of the science element of the science (physics) curriculum for all exam boards.

It allows students who visit Isle of Wight Steam Railway to engage with the scientific aspects within this environment.

Students can use formulae to work out the energy transfer between the engine and the carriages. They will also analyse the energy requirements to move the carriages through various sections of the railway line.

Students will present their observations and data using appropriate methods, including tables, showing how they have completed equations.

Task Implementation

This task can be introduced to students before their visit to Isle of Wight Steam Railway.

Students need to have learned the following to make use of this resource:

- ▶ The equation for calculating the amount of work done by a force
- ▶ The theory behind kinetic energy

When on site at the railway, students can then complete their practice and answer questions on the sheet as they move around the venue.

This will focus students' attention on the key areas for learning.

Ability Levels

There are 2 versions of this resource intended for lower and higher abilities in key stage 4. However, the resource can be adapted by teachers for other ability groups or younger students for stretch and challenge if required.

Key skills practised in this unit:

- ▶ Present observations and data using appropriate methods, including tables
- ▶ Use of standard equations
- ▶ Identifying aspects of force, distance and energy transfer
- ▶ Drawing conclusions from their observations at the railway

Relationship to Curriculum

The above skills are required to be taught and practised as per the National Curriculum 2014, the Scottish Curriculum for Excellence, and for all exam boards at key stage 4 (physics/additional science).



SUBJECT

Science (Physics & Additional Science)

UNIT

Forces - Transferring Energy

OPPORTUNITIES FOR USE

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



45-60 Mins

APPLICABILITY



KS4



S3 - S5

CURRICULUM / SYLLABUS

- ✓ National Curriculum 2014
- ✓ Curriculum for Excellence
- ✓ All Exam Boards

Applies to Resource number



Learning Opportunities

Pre-Visit

Students need to have done some preparatory work on using the equation for calculating the amount of work done by a force, as well as kinetic energy and theories associated with this.

During the Visit

Completion of Science key stage 4 Isle of Wight Steam Railway resource linked to this document:

Transferring Energy

Resource ID: **101631** (higher ability), **101632** (lower ability),

Post Visit

Follow-up tasks could include:

- ▶ Class discussion of their overall findings at Isle of Wight Steam Railway
- ▶ Completion of labelled diagrams, PowerPoint slides, or animations showing these examples

Enrichment Opportunities

This resource enables students to practise and see their calculations in action, in situ, which will enhance their understanding and compound prior learning.

Learning Outcomes

Students will be able to demonstrate, practise and consolidate their understanding of the scientific principles identified above.

Students will be able to practise and present observations and data using appropriate methods, including tables whilst using and devising equations.

See Also...

Other resources at Isle of Wight Steam Railway relevant to this age group include:

101234	History	Investigate the Railways!
101571	English	Summarising Train Story
101611	Art & Design	Can You Design?
101411	Science	Kinetic Energy in action
101621	Science	Displacement, velocity and acceleration
101122	English	Understanding railway texts

For further details visit www.edudest.info and click:

- ▶ *Resource Finder* - to locate specific resources identified above
- ▶ *Venue Finder* - to learn more about education at this venue
- ▶ *Subject Finder* - to find other relevant Isle of Wight venues

