

TEACHER NOTES

Picturing Motion: Displacement, Velocity & Acceleration

Contextual Summary

This resource is for key stage 4 students who are covering motion as part of the science element of the science (physics) curriculum for all exam boards. It is also relevant to OCR additional science.

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 average speed of the train. They will also analyse the motion of the train in relation to displacement, velocity and acceleration. Students will present their observations and data using appropriate methods, including tables and distance-time/ displacement-time/ speed-time graphs, showing how they have completed simple equations.

Task Implementation

This task can be introduced to students before their visit to Isle of Wight Steam Railway. Before they arrive they should have learned the learned the following to make use of this resource:

- ▶ Distance - time graphs
- ▶ Displacement - time graphs
- ▶ Speed - time graphs

Students should also learn how to convert mph into kilometres per hour. 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 and graphs
- ▶ Use and devise simple equations
- ▶ Identifying aspects of motion, displacement, velocity and acceleration
- ▶ 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

Picturing Motion

OPPORTUNITIES FOR USE

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



90-120 Mins

APPLICABILITY



KS4

S3 - S5

CURRICULUM / SYLLABUS

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

Applies to Resource number



Learning Opportunities

Pre-Visit

Before the visit, students will need to know about and how to draw distance - time graphs, displacement - time graphs, and speed - time graphs

During the Visit

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

Picturing Motion: Displacement, Velocity & Acceleration

Resource ID: **101621** (higher ability), **101622** (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 processes identified above. Students will also be able to practise and present observations and data using appropriate methods, including tables and graphs, such as displacement-time graphs, whilst using and devising simple 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
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