

TEACHER NOTES

Physics

Motion & Forces, Working Scientifically

Contextual Summary

This on-site resource is for students at key stage 4 and relates to the 'Motion and Forces' part of the Science National Curriculum, focusing on acceleration caused by forces, the quantitative relationship between acceleration, change in velocity and time.

The tasks link to their journey on board the Red Funnel vehicle ferry. The task then encourages students to compare their data to the Red Jet passenger ferry.

Tasks are designed to appeal to students at key stage 4 working at lower or higher abilities.

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This is a resource that is designed to be completed on-site, with students recording data relating to the speed of the ferry during the journey on the Red Funnel ferry.

Students can complete a 'Speed & Acceleration' worksheet that relates to their experiences of the various activities. Students can also use data to make comparisons between the Red Funnel vehicle ferry and the Red Jet passenger ferry. Some students will then apply their knowledge of the ferry journey to complete a velocity-time graph.

Ideally, teachers will have introduced students to the concept of velocity as a vector quantity. The calculations part of the worksheet could be completed pre-visit if desired.

Ability Levels

There are two variants of this resource for students of higher and lower ability in key stage 4. Teachers can support as necessary.

Key skills practised in this unit:

- ▶ Carrying out calculations
- ▶ Transposing formula
- ▶ Application of knowledge
- ▶ Manipulating data into a graphical form.

Relationship to Curriculum

This resource links to the required teaching as specified by the various exam boards at key stage 4.



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RED FUNNEL

SUBJECT

Physics

UNIT

Motion & Force (Speed/Acceleration)

OPPORTUNITIES FOR USE

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



Peripheral Task

S4-S5

CURRICULUM / SYLLABUS

- ✓ All exam boards

Applies to Resources numbered:

1 0 7 0 9 1
1 0 7 0 9 2

Learning Opportunities

On-Board

Students complete the Science resource linked to this teacher note:

Resource ID: **107091** (KS4 low-mid ability)

107092 (KS4 mid-high ability)

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the Key Stage 4 national curriculum and examination board criteria.

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- ▶ The worksheets and experiences will enable students to have a greater understanding of velocity and acceleration allowing them to relate to other unfamiliar examples.

Learning Outcomes

- ✓ Students will use the equations:
 - » **Speed = distance ÷ time** &
 - » **acceleration = change in velocity (m/s) ÷ time taken for the change (s)**
 to carry out their calculations.
- ✓ Students will apply their knowledge to complete velocity-time graphs.

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