



Science lesson 2 - Teacher notes

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Learning aim:

To calculate, evaluate and present conclusions from distance time graphs.

Curriculum links and Skills Builder focus skills chart:

England The national curriculum (England)	Physics - forces and motion Pupils should be taught about interpreting quantitatively graphs of distance, time and speed.
Scotland SQA National 5 Physics	Physics - Dynamics - Vectors and scalars Determination of velocity and/or speed using scale diagram or calculation. Use of appropriate relationships to solve problems involving velocity, speed, displacement, distance and time.
Wales WJEC GCSE science (double award) specification	Physics - distance, speed and acceleration Learners should be able to demonstrate and apply their knowledge and understanding of speed-time and distance-time graphs.
Skills Builder Framework Focus Skills	
Problem solving – The ability to find a solution to a situation or challenge	Problem solving step 5 I explore problems by thinking about the pros and cons of possible solutions.
Speaking – The oral transmission of information or ideas	Speaking step 5 I speak effectively by using appropriate language.

Main skills developed and how:

- Calculation - Students will calculate time and distance from distance-time graphs.
- Evaluation - Students will evaluate and draw conclusions and discuss/present their findings based on their calculations and the information provided.

Equipment required:

- PowerPoint
- Calculators
- Student worksheet

Suggested layout of the session:

5 minutes – Go over the first 9 slides of PowerPoint which outline the session aim, the scenario and the task. After reading through the task, students should then work in groups of 3 and will take one of the 3 graphs to be analysed. They need to support each other with calculations.

10 minutes – Students should discuss and answer question 1 as a group and complete task 2 individually. Guidance on who does which graph is on slide 9. (The youngest in the group should take graph 1, the oldest, 2, and the remaining group member should take graph 3.) The formula triangle is on the worksheet for distance/time to support.

5 minutes – Conduct a feedback session where each group explains 2 of their answers. There should be enough answers for each group to provide at least one response. They also need to state if Aliyah was correct or not. Finally, hold a class vote for the HS2 route that they think should be started first based on their findings.

Ways to differentiate:

- Use the extension task on slide 13 of the PowerPoint to strengthen and deepen learning – it could be printed off or displayed – the answers are on slide 14.
- Students could write a short report to the Department of Transport explaining why Crewston to Liverpool is the best route to start and why the planning department should NOT start with Ladychester or Birmingham.

How to extend the session – if required:

Draw the distance time graph for the Liverpool to Ladychester route which has already been built by the Department of Transport.

The graph must show 50 miles over 3 hours. There are 2 stops of half an hour each after 1 hour and 2 hours. The first stop takes place at 25 miles, the second at 40 miles. You can find the answer on slide 15 of the PowerPoint.

