

HS2 have developed a new collection of STEM lessons and activities, to support teachers who would like to bring a careers context to curriculum learning.

These resources are available on our website and in most cases would be suitable for students who are learning at home:

www.hs2.org.uk/education

STEM Lessons

These are plans for STEM lessons which teachers can use to introduce a careers context to a regular curriculum lesson. The activities are expected to take 1-2 hours to complete and are aimed at 11-14 year olds.

Each activity includes:

- PowerPoint presentation.
- Worksheet.
- Teacher notes.

Many of these activities would be suitable for students learning at home.

Motorway Bridge Challenge

Description: Students will apply their maths skills to choose between different options for the construction of a road bridge across a motorway. Students will decide on the construction site and type of bridge, considering the environmental impact, cost and time to construct each option.

Target age: 11-14 years old.

Completion time: 1 hour.

Resources needed: PowerPoint presentation and PDF worksheet are provided.
Calculator.

Curriculum links & skills: Mathematics and design and technology. Problem solving and teamwork.

Great Crested Newts

Description: Students will research the lifecycle, characteristics and ecology of great crested newts, and apply this knowledge to choose a site for the construction of a new newt habitat.

Target age: 11-14 years old.

Completion time: 75 mins.

Resources needed: PowerPoint presentation and PDF worksheet are provided.

Curriculum links & skills: Science. Problem solving.

Making History

Description: Students will interpret the history of a site using archaeological skills. By looking at pollen records and artefacts, students will explore the relationships between changing habitats and human activity. Students will discover how Archaeologists combine history and geography with STEM subject knowledge to find out about the past.

Target age: 11-14 years old.

Completion time: 75 minutes.

Resources needed: PowerPoint presentation and PDF worksheet are provided.

Curriculum links & skills: Science, geography and history. Problem Solving.

Connected Economy

Description: Students will complete a case study of a fictional town soon to be connected to a larger city by rail. Students will find out how being connected will transform the local economy and then present their findings to local stakeholders.

Target age: 11-14 years old.

Completion time: 2 hours.

Resources needed: PowerPoint presentation and PDF worksheet are provided.

Curriculum links & skills: Geography and design and technology. Speaking, listening and teamwork.

Design for Everybody

Description: Students will examine and apply universal design; meeting a range of customers with different needs and writing a design specification for a train station waiting room. Students then analyse an existing product and propose improvements according to universal design principles.

Target age: 11-14 years old.

Completion time: 1 hour.

Resources needed: PowerPoint presentation and PDF worksheet are provided. Tape measure or ruler.

Curriculum links & skills: Design and technology. Problem solving and creativity.

Public Spaces and Urban Design

Description: Students will design a new public square that will be outside a new train station in their city, town or village. This activity is an opportunity for students to practise urban design skills and to respond to the history and environment of their local area with a creative project.

Target age: 11-14 years old.

Completion time: 2 hours.

Resources needed: PowerPoint presentation and PDF worksheet are provided. Graphic materials such as coloured paper, pens and pencils.

Curriculum links & skills: Design and technology. Problem solving and creativity.

SEND STEM lessons

These resources are aimed at teachers and ambassadors who would like to lead one of our EPIC Engineers STEM workshop activities for a group of students with a Special Education Need or Disability.

The pack includes suggestions and resources for adapting the existing EPIC Engineers activities and alternative activities that may be more suitable for some groups. The activities are likely to be suitable for students with mild or moderate learning disabilities.

Each activity includes:

- PowerPoint presentation.
- Student worksheet/s.
- Teacher notes.

Most of these activities could be done by a student learning at home, but in some cases require extra resources that may not be available at home.

Train Station Design Challenge

Description: This is a 'design-and-present' activity in which students will work in teams to design a train station. Students will have to use their creativity, teamwork and speaking essential skills to create and present their idea.

Target group: Suitable for students with mild or moderate learning difficulties.

Completion time: 90 mins.

Resources needed: PowerPoint presentation and PDF worksheet are provided. Scissors, glue and coloured pencils.

Curriculum links & skills: Design and technology. Creativity and speaking.

Tunnel Structures Challenge

Description: This is a 'making and testing' activity in which students will work in teams or in pairs to make a tunnel structure using straws, tape and scissors. At the end of the lesson the tunnel structures will be tested to see which structures survive and which don't.

Target group: Suitable for students with mild or moderate learning difficulties.

Completion time: 90 mins.

Resources needed: PowerPoint presentation and PDF worksheet are provided. Building materials such as art straws or newspaper and a load such as a bag of rice or flour.

Curriculum links & skills: Science and design and technology. Problem solving.

Insect Hotel

Description: This activity helps students discover why insects are so important. Students will study the importance of insects in our ecosystem and then help to build an insect hotel.

Target group: Suitable for students with mild or moderate learning difficulties.

Completion time: 80 mins.

Resources needed: PowerPoint presentation and PDF worksheet are provided. Tubes and materials such as straw, pine cones and bamboo sticks.

Curriculum links & skills: Science and design and technology. Creativity and problem solving.

Travelling by Train

Description: This activity helps students to prepare for independent travel by train, through role play activities involving timetables and station staff. Students can develop their speaking skills and career readiness through workplace and interview scenarios.

Target group: Suitable for students with mild or moderate learning difficulties.

Completion time: 90 mins.

Resources needed: PowerPoint presentation and PDF worksheet are provided.

Curriculum links & skills: English and mathematics. Speaking and listening.