

# TUNNELWORKS

## BTEC LEVEL 2

### TEACHERS' NOTES

#### About this activity

This activity helps students apply their knowledge and understanding of PPE. Students consider a realistic scenario for visitors to a busy engineering construction site and maintenance workshop and identify appropriate PPE, justifying their decisions.

#### Learning outcomes

##### Students can:

- Identify some hazards on a busy engineering construction site.
- Choose the right PPE for a visitor to wear.
- Explain their choices and suggest how else a site manager can help visitors stay safe on site.

#### Curriculum links

##### Edexcel BTEC Level 2 Certificate, BTEC Level 2 Extended Certificate and BTEC Level 2 Diploma in Engineering (QCF)

- Unit 1 Working safely and effectively in engineering
- The materials are also relevant to BTEC Construction courses.

*Note: this activity is not intended to provide complete evidence for assessment and should be used to complement other activities and assignments.*

#### What you will need

- BTEC presentation slides BTEC 1-8
- Student scenario sheet
- Level 2 Student sheet

*You may want examples of PPE and copies of relevant statutory guidance eg HSC13, 'Health and Safety Regulation - a short guide'. Please allow time to show the introductory video at the start of the presentation.*

## Preparation

Watch the introductory video if you are not familiar with the Thames Tideway Tunnel. Review the delivery plan for the activity (below) and the student sheets and presentation, and consider appropriate differentiation for your class. Add timings to suit your session length. You may want to show additional images of engineering workshops, or make use of students' experiences of real engineering environments to date.

Time (60mins)	Teaching activity	Learning activity
5 mins	<b>Starter:</b> Review PPE. Ask students to work in small groups to name and list as many PPE items as they can, and their possible uses.	Name or create lists of PPE. Explain its use and some possible criteria for selecting each item.
10 mins	<p><b>Whole group:</b> Screen BTEC 1-2: Introduce the scenario and discuss hazards on large heavy engineering or construction sites, drawing on students' experiences or what they have seen on TV etc.</p> <p>Screen BTEC 3: Review the task.</p> <p>Screen BTEC 4-6: Watch the video (NB no sound) and slides, and lead a discussion to identify key information students need to know to choose the right PPE, eg:</p> <p>Key activities on site Likely ground conditions Hazards (especially in the Tunnel Boring Machine maintenance workshops) Visitor familiarity with the environment</p>	<p>Share ideas about what life on the site will be like and some key hazards.</p> <p>Share ideas to confirm understanding. Observe video and identify key information that will help them, sharing ideas.</p> <p>Contribute to discussion.</p>
10 mins	<b>Pairs or individuals:</b> Screen BTEC 7: Lead students as they review the Student Sheet and Scenario Sheet and choose PPE for visitors to the site and workshops.	Select appropriate PPE. Justify their decisions.
10 mins	<b>Whole group:</b> Share ideas, asking students to explain how they might brief the visitors.	Explain how they would help visitors safely put on PPE.
10 mins	<b>Plenary:</b> Review regulations governing PPE and discuss the implications of not following regulations.	Contribute to discussion. Identify implications (safety, legal) of not providing adequate PPE for visitors or not ensuring this is work correctly.

## Differentiation

Easier	Harder
Add detail and further suggestions to help students imagine hazards at the site or in workshops, drawing on other images you have available.	Using the level 3 Student sheet as a guide, ask students to identify two or three potential risks and write a simple risk assessment for site visitors to the workshop, focusing on using PPE as a control measure.

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## Follow-up ideas

Discuss how PPE is sourced and why approved standards are vital (eg kitemarking) for each item. Explore students ideas about who is responsible for providing, maintaining and using PPE, linking this back to students' knowledge of relevant legislation.

Include PPE related to COSHH, using examples of key COSHH hazard symbols and common signage. Ask students to research site warning signs that might appear in an engineering environment and prepare a short presentation to explain each one and what PPE may be required.

Ask students to write or formally present a verbal PPE briefing for site visitors, explaining what visitors must wear, why this is important for their safety, and how to put each item on properly.

## Tunnelworks BTEC Scenario Sheet

### What will happen at a Thames Tideway Tunnel main construction site?

The Thames Tideway Tunnel is a major new sewer that will help tackle the problem of overflows from the capital's Victorian sewers. It will protect the River Thames from increasing pollution for at least the next 100 years.

The Tunnel will control the 34 most polluting combined sewer overflows (CSOs), as identified by the Environment Agency, which currently discharge untreated sewage directly into the River Thames after it rains.

A construction site will be needed at numerous CSO sites and at the three sites from which the main Tunnel will be excavated.

This image shows what one of the three main Tunnel construction sites may look like:



### Key activities at a main Tunnel construction site\*

- Below ground, a Tunnel Boring Machine (TBM) will excavate the main Tunnel
- Soil and/or rock slurry will be transported to ground level
- Heavy machinery will transport this to storage silos and from there onto the loading conveyor for barges to remove via the river
- Heavy goods vehicles will deliver concrete tunnel segments, concrete and other materials to the site
- TBM parts, equipment and the tools to maintain and repair them will be stored and used in busy workshop buildings
- There will be an area for parking, and office / rest buildings
- Staff and contractor vehicles will enter and leave the site

*\*Sites at each CSO would include some similar activities, but would not have a TBM or Tunnel segments on site.*