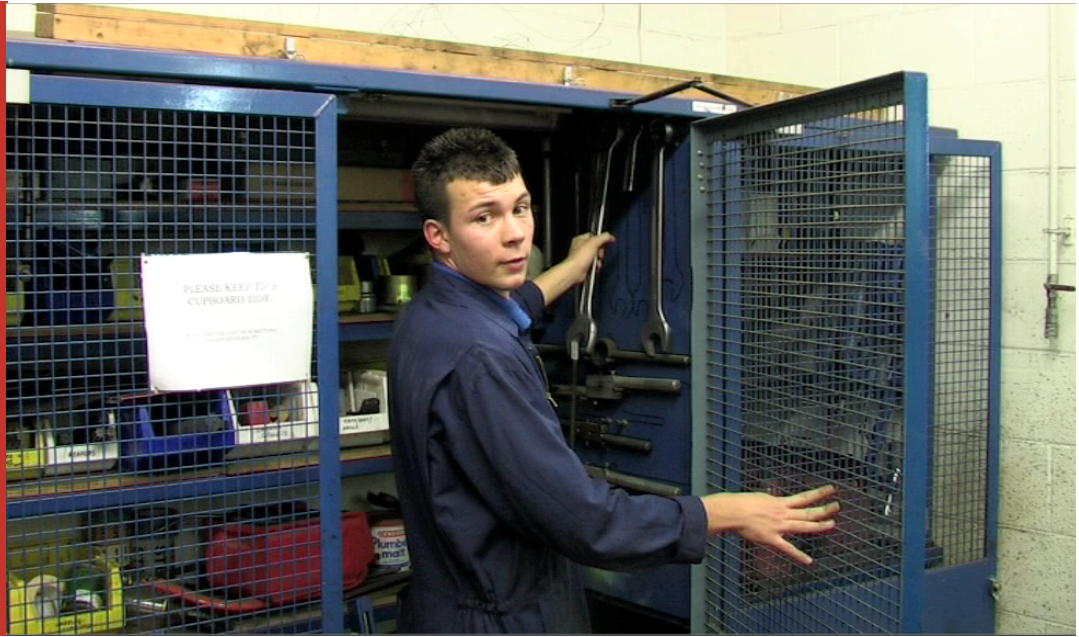


APPRENTICE MAINTENANCE ENGINEER

Jake (17) works for D S Smith Packaging, manufacturers of packaging for the food industry. He is halfway through an apprenticeship in electrical mechanical engineering and works with a qualified engineer maintaining and repairing the factory machines.



Curriculum Links

	Design Technology	PSHE KS3
Key Concepts	1.1 a-b c, 1.2 b, 1.3 a-c 1.4 a-c	1.1 a-c, 1.2 c, 1.3 b
Key Processes	a b c d e f g h	2.1 a cd, 2.2 a, 2.2 a-b, 2.3 ac, f
Range and Content	b c e J, l, m	a,b,e
Curriculum Opportunities	a b c d g	a b c d e g h j

Key points in Jake's interview

- Jake demonstrates how to mark out and drill metal safely and accurately using the correct tools.
- Jake talks of the importance of being aware of safety risks within the factory.
- Whilst at school, Jake was good at Art and DT and interested in mechanical things.
- Jake needs to be able to solve problems quickly and act in a calm manner.
- Training to be a multi-skilled engineer allows Jake to easily transfer skills across all areas of engineering.

Watching the interview (duration 4' 40")

Before watching the video, tell your class that you will be testing them on their observation when it's finished. You can pre-view the video and write your own questions or use the 'Quick Questions worksheet' provided with this pack. An excellent way of making sure your students are paying attention!

Ask your class to look out for anything that they might recognise or have studied within a Design and Technology lesson. Discuss what they have seen in the video with what they have practiced in school. This creates a sense of purpose to their learning.

Before the video, ask the class what they think the job might involve and whether the career appeals to them. Following the video discuss the same questions, finding out anything new that they might have learnt about the job. Encourage the class to reflect on their personal strengths and weaknesses and comment on their suitability for the job.

This encourages students to consider their personal skills when thinking about a career.



The Hook Project

This project focuses on making and allows students to practice their making skills in response to a brief. A design element can be added if time and resources allow.

Students could create their own personalised design using CAD. Use a vinyl printer to cut out the designs ready for students to attach to their end product.

A template should be designed for this to ensure the design fits the end product

Equipment and Resources

Goggles
Aprons
Stainless steel
Metal file
Glass paper
Sanding block
Hammer
Centre Punch
Set square
Scribe (Optional)
Permanent pen or pencil
Steel rule
Pillar Drill
4/5mm drill piece
Metal vice
Pre- made Bending jig (optional)
Scrap pieces of wood

Time needed

The project can be taught over 5– 10 lessons, depending on lesson duration and class age and ability,

Or the focused activity can be used as a standalone task.

Health and Safety

- Aprons must be worn when carrying out practical work
- Hair tied back if appropriate
- Ties should be tucked in
- Suitable footwear should be worn
- All jewellery must be removed
- Goggles must be worn when using machines
- No running within the workshop

Brief

To design and make a coat hook, which can be placed over the top of a home interior door.



Specification

It must fit the width of a standard home door.
It must be of an appropriate material.
It must have a hole at the top to fit a screw.

It must be functional.
It must be safe to use.
It should appeal to its target market.
It should be aesthetically pleasing.

Plan of study

Research

Students can use primary and secondary sources to research inspiration for the unique vinyl sticker designs.

Design – Initial ideas

Students sketch 4 different designs for their personalized stickers.

– Developed ideas

After analysis and feedback students can develop their initial designs and develop into a final using CAD.

Make

Skills in metal work including hand tools and machinery can be developed throughout the making stage.

Evaluation

Students should be encouraged to get feedback for the finished product and evaluate the outcome.


Quick focused task

For low ability classes you can focus one or more lessons on using the correct equipment to prepare a metal for drilling.

Students can practice measuring the width of the metal to find the centre.

Metal can be placed in a vice if needed.

Create punch mark using centre punch– Explain why we do this

Continue to setting up the pillar drill to create hole. 

Some practical advice for Teachers

1 .

Pre cut steel strips 25mm x 200mm
Place strips of metal into a vice round the edges using the metal file.
Use glass paper around a block to ensure edges are smooth.

2 .

Metal must be measured and marked using a centre punch to find the centre point for drilling.
Emphasise the point of using a centre punch to stop the drill wandering.

3 .

Drill the hole using pillar drill. 

4 .

Students will have to measure the width of the door for correct fitting of the product. Allow 2mm either side for a good fit.

5 .

If you do not want to make a jig for the bending you can use a vice and scrap pieces of wood. Hammer the metal into a 90° angle, using the wood to protect the metal from marking.

6 .

Using the vice again to create the curve of the hook, this time bending and shaping the metal into a rounded curve. This could also be done using a forge to heat the metal.

7 .

If appropriate vinyl graphics can be applied when the end product is finished.



Associated and related careers

The Design Technology curriculum provides students with a diverse range of knowledge and skills that can be easily transferred across subject areas. Functional skills, Personal Learning Thinking skills are taught alongside practical skills. This activity focuses on making students more aware of the value of these skills and how they relate to the working environment.

After watching the interview, as a class, create a list of the skills that Jake needs to have within his job.

Then place Jake at the centre of a spider diagram. You can ask the students to complete this task in groups and provide suitable worksheets, or encourage the students to participate in a class discussion and draw the diagram on the board.

Associated and Related Careers cont.

Ask the class 'Who does Jake work with?' Students can refer back to the video for information or come up with new ideas. Encourage the students to keep on expanding the diagram so you end up with a diverse range of careers.

Once complete ask the students to match the skills that Jake uses in his job to these associated jobs.

Use a coloured pen to emphasise skills that occur more than once in the star diagram.

The students should find that many of the skills are transferable and are needed for a variety of jobs.

To extend this task further you could keep the focus on just functional skills

- English
- Mathematics
- ICT

Or focus on Personal Learning and Thinking skills

- Independent enquirers
- Creative thinkers
- Reflective learners
- Team workers
- Self-mangers
- Effective participants

Discuss the need for these focused skills in school and the work place.