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OUT OF LESSON WORK

TERM 1

ENGINEERING

YEAR 11

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Activity sheet 1.1: What is engineering?

Learning aim A: Understand engineering sectors, products and organisations, and how they interrelate
Learning aim A1: Engineering sectors, engineered products and interconnections

1. Write down the definition of engineering.

_____

_____

2. In the space below, write down the four main engineering disciplines. Give a brief explanation as to what each of them is.

a) _____ engineering

Explanation:

_____

_____

b) _____ engineering

Explanation:

_____

_____

c) _____ engineering

Explanation:

_____

_____

d) _____ engineering

Explanation:

_____

_____

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3. For each discipline in engineering, use the internet to research an engineered product that has improved our world. Complete the table below to show your findings.

Engineering discipline	Engineered product	How has it improved our world?

Extension task: Choose one of the engineering disciplines. Write down one way in which this discipline might benefit us in the future.

Activity sheet 2.9: Cutting

Learning aim A: Understand materials, components and processes for a given engineered product
Learning aim A3: Processes

1. Name four different cutting processes in the table below and give a definition for each one.

Cutting process	Definition
1.	
2.	
3.	
4.	

2. Give a definition for each of the engineering terms listed below.

Key term	Definition
Workpiece	
Blind hole	
Pilot hole	
Teeth per inch (TPI)	

3. Give two advantages of laser cutting.

1: _____

_____

2: _____

_____

Activity sheet 2.14: Tools in a workshop 1

Learning aim B: Investigate a given engineered product using disassembly techniques
Learning aim B1: Practical engineering skills

1. Look at a range of tools in your engineering workshop and complete the table below.

Workshop tool	What it is for?	Do I know how to use it correctly? Yes/No

2. Write a product design specification that you think would be appropriate for a current mobile phone.

Activity sheet 2.10: Joining

Learning aim A: Understand materials, components and processes for a given engineered product
Learning aim A3: Processes

1. Write down the best joining techniques to use for the following engineering tasks. Remember to give reasons for your answers.

   a) Mounting electronic components on a printed circuit board.

   b) Joining two mild steel pipes.

   c) Joining heavy steel girders on a bridge.

   d) Joining two pieces of acrylic together.

2. What is the difference between permanent and non-permanent fastening?

3. What is the main reason for using pins and dowels in engineering?

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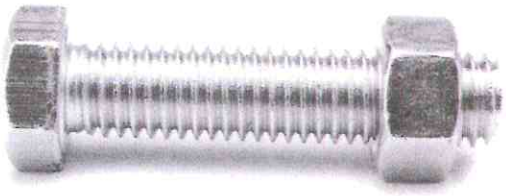
Activity sheet 2.7: The terms 'tolerance' and 'proprietary'

Learning aim A: Understand materials, components and processes for a given engineered product
Learning aim A2: Components

1. What does the term 'proprietary' mean in an engineering context?

2. What does the term 'tolerance' mean in an engineering context?

3. The bolt shown below has a specified length of 80 mm with a tolerance of ± 0.5 mm.



a) What is the minimum acceptable length of the bolt?

b) What is the maximum acceptable length of the bolt?

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4. What does the term 'product-specific' mean in an engineering context?

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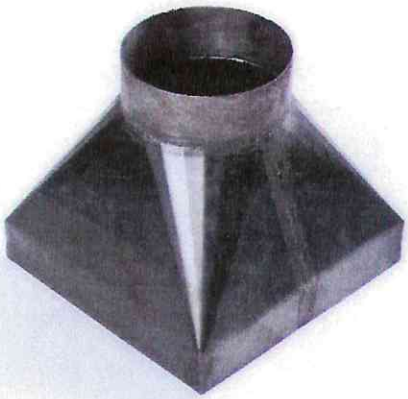
Activity sheet 3.12: Analysing a component

Learning aim B: Provide a design solution for an engineered product against the needs of an engineering brief
Learning aim B1: Interpretation of a given brief for an engineered product

How does it work? What features does it have? How is it finished? These are some of the questions that you should be answering when you analyse an engineered product or component.
Work with a partner to analyse an engineered component.

1. Look at the engineered component below. Make a list of the features of the product.



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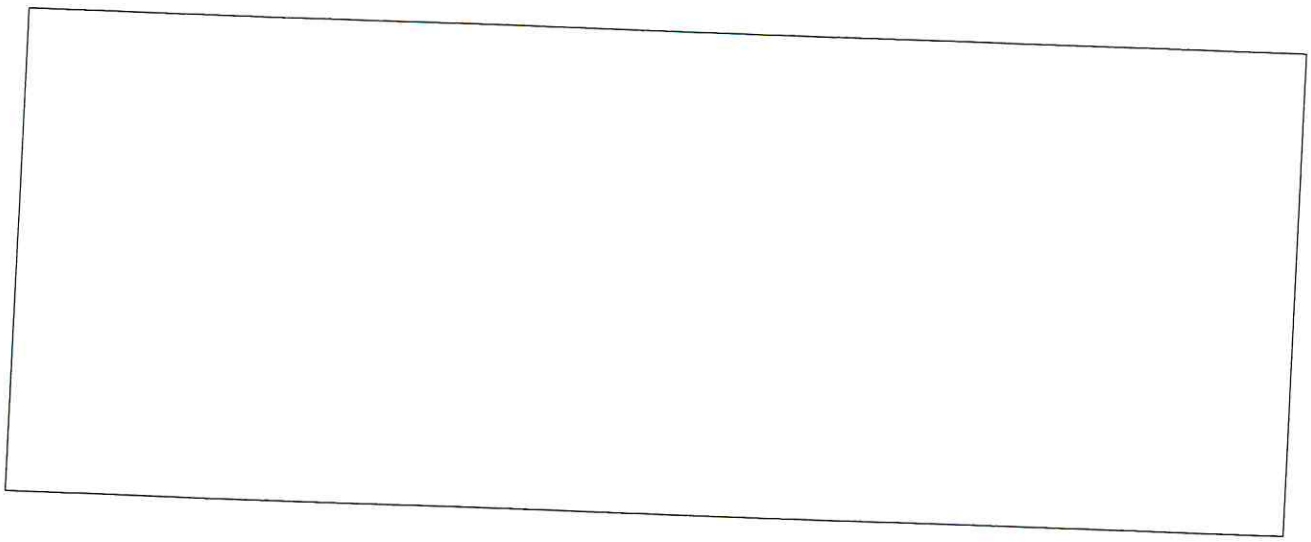
2. Sketch the component and label the various features of the component.



3. Investigate the features of the product and make notes about the following.
   (Note: make notes or highlight the features that you think are most important for the component to work as intended).

   a) Dimensions

   b) Surface finishes

c) Physical form

4. Write a short paragraph to explain why tolerances are important.