

Colmers School and Sixth Form College

Opening Minds, Opening Doors



COLMERS SCHOOL
& SIXTH FORM COLLEGE

Key Stage 4 Engineering

Year 11

Autumn Exam Preparation

Assessment Cycle One

21st October to 15th November 2024

NAME: _____

FORM: _____

TEACHER: MR A. Bagnall

Achieving Excellence, Belonging Together, Challenging Mindsets

Colmers School and Sixth Form College



COLMERS SCHOOL
& SIXTH FORM COLLEGE

Year 11 Engineering Milestone Assessment Booklet

Assessment Cycle One

Your assessment will require you to use and apply the skills below. Use this as a skills checklist.

You have an assessment week during the week beginning

- This booklet will help you revise and prepare thoroughly for your assessment.
- One of the tasks that appears in this booklet will be very similar to your assessment task.
- This revision booklet contains tasks that require you to read and recap on key skills and knowledge.
- The first part of the booklet requires you to **RAG** rate the skills that you will be required to use in your assessment (see instructions on that page).
- Attempt every question.
- Take your time on the writing tasks and make sure that you read through your work regularly.
- If you do get stuck, look for this symbol: **SUPPORT** or ask your teacher for help.
- Try your absolute best!

SUPPORT
YOUR CHILD AT HOME

Tasks	✓	Tick off which tasks you have completed.	Tasks	✓
Task 1			Task 5	
Task 2			Task 6	
Task 3			Task 7	
Task 4				

Don't Miss the
DEADLINE!

<u>Week One</u>	<u>Week Two</u>	<u>Week Three</u>
RAG Rate	Task 3	Task 6
Task 1	Task 4	Task 7
Task 2	Task 5	RAG Reflection
To be completed by:	To be completed by:	To be completed by:
21 October	4 November	11 November

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Year 11 Engineering Autumn Exam Preparation

Assessment Cycle One



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Your assessment will require you to use and apply the skills below. Use this as a skills checklist.

Self-Assessment

Before you begin the activities in this booklet, rate yourself against the areas below.

Skill	<u>RAG Rating</u> (Circle or shade how confident you are) R = Red (not confident at all) A = Amber (not very confident) G = Green (really confident)			How do you plan on improving your confidence?
Design Strategies.	R	A	G	
The 6 R's of sustainability.	R	A	G	
Modelling and Prototypes.	R	A	G	
Manufacturing Processes.	R	A	G	
Researching.	R	A	G	
Scales of Production..	R	A	G	
Communicating Design.	R	A	G	

Final Evaluation

Once you have completed the booklet, refer back to this table; it will help you to see what skills you have improved on; where your confidence has grown and what areas you still need to work on.

Use it to help you complete your final reflection (final page).

Task One: Design Strategies



Use the resources that you have been given in your lessons to complete this task. You should also use your revision guide to help you.

1. Complete the table to summarise the key characteristics, advantages and disadvantages of each of the different design strategies. The first one has been done for you.

	Key Characteristics	Advantages	Disadvantages
Linear Design	• Step-by-step process, moving from one step to the next. • Each step must be completed before moving on to the next. • Cannot usually go back to previous stages.	• Perhaps the quickest and simplest design process.	• Errors in design cannot always be corrected so the final design might not be the best.
Iterative Design			

	Key Characteristics	Advantages	Disadvantages
Inclusive Design			
User Centred Design			

	Key Characteristics	Advantages	Disadvantages
Sustainable Design			
Ergonomic Design			

Task Two: The 6 R's of Sustainability

Using a ruler to draw a line, match each of the 6 R's of sustainability to the correct definition.

RETHINK

Reprocess a material or product and make something else

REUSE

When a product breaks down or doesn't work properly, try to fix it.

RECYCLE

Do we make too many products? Design in a way that considers people and the environment.

REPAIR

Cut down the amount of material and energy you use as much as you can.

REDUCE

Don't use a material or buy a product if you don't need it or if its bad for the environment.

REFUSE

Use a product to make something else with all or parts of it.

Task Three: Prototypes



Use the resources that you have been given in your lessons to complete this task. You should also use your revision guide to help you.

1. What is a prototype?

.....

2. What is a virtual model?

.....

.....

3. List three advantages of virtual modelling.

(i)

(ii)

(iii)

4. List three disadvantages of virtual modelling.

(i)

(ii)

(iii)

5. What is a physical model?

.....

.....

.....

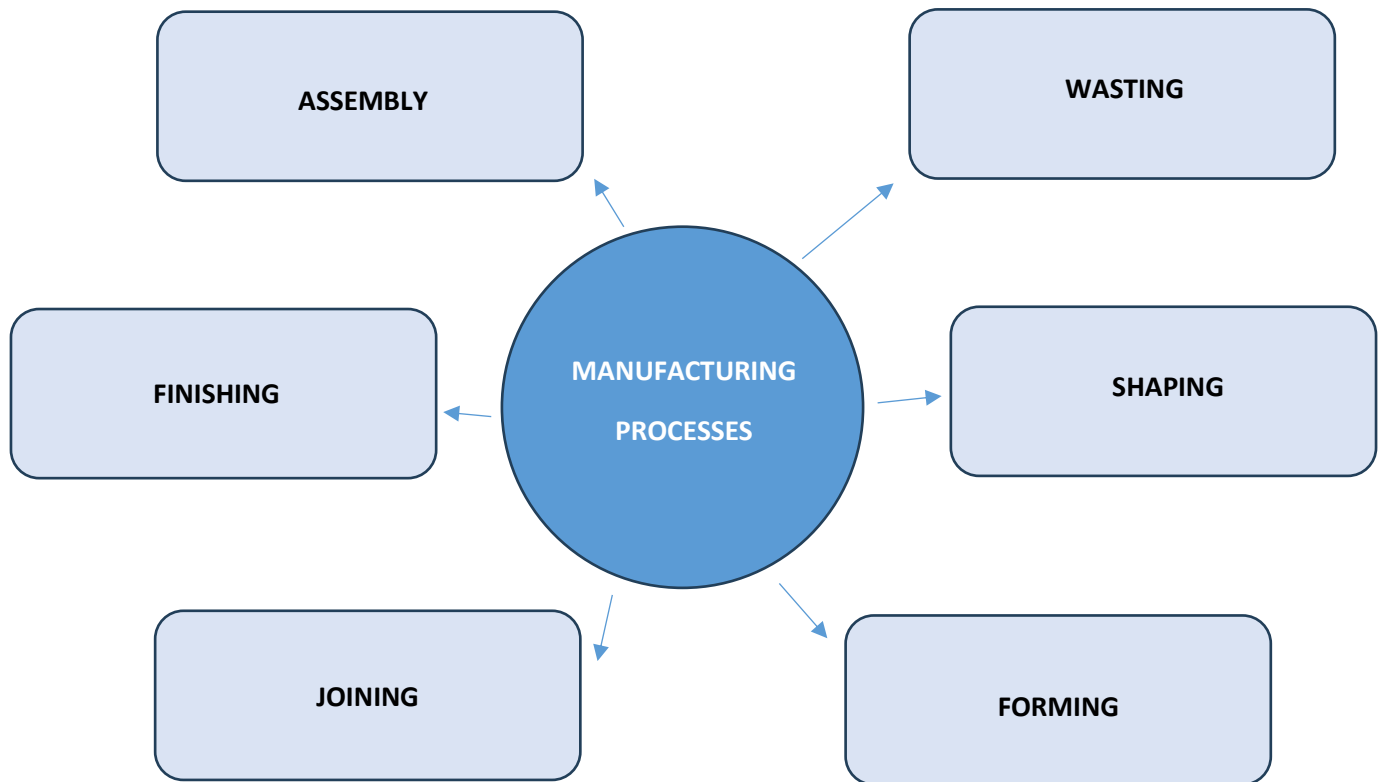
Complete the table about physical modelling materials, identifying the key characteristics, advantages and disadvantages. The first one has been done for you.

	Key Characteristics	Advantages and Disadvantages
Card / sheet materials	- Models are made from card or other sheet materials. - Material is cut to shape and joined to other pieces to make the model. - The model will often be a smaller (scaled) version of the product.	Advantages: - Low-cost materials are available in a range of types and colours. - It only requires simple tools and processes. - Models are relatively quick to produce. Disadvantages: - Models are often non-functional. - Models are not made from production materials so they will not look and feel like the final product. - It is only useful for relatively simple models.
Block materials		

	Key Characteristics	Advantages and Disadvantages
Breadboarding		
3D Printing		

Task Four: Manufacturing Processes

Manufacturing processes change the shape, size, or properties of a product in a useful way. There are six different types of manufacturing process, each of which change materials or products in a different way. They are:



For each type of process, there may be several different methods or tools that could carry it out.

TASK:

On the following page create a mind map for manufacturing processes with details about each type of process, the materials that can be used, along with any advantages and disadvantages that you identify.

Use the knowledge organisers that you have been given in your lessons to complete this task. You should also use your revision guide: the **glossary** to help you.

You could also look at this website:

<https://www.bbc.co.uk/bitesize/guides/zk9g4qt/revision/2>



Task Five: Researching

1. What do you understand by the term **PRIMARY RESEARCH**?

.....

2. Give some examples of sources of **PRIMARY RESEARCH**.

.....

.....

3. What are the advantages of primary research?

.....

.....

.....

.....

4. What are the disadvantages of primary research?

.....

.....

.....

.....

5. What do you understand by the term **SECONDARY RESEARCH**?

.....

6. Give some examples of sources of **PRIMARY RESEARCH**.

.....

.....

7. What are the advantages of secondary research?

.....

.....

.....

.....

8. What are the disadvantages of secondary research?

.....

.....

.....

.....

Task six: Scales of Production

The scale of production, also known as scale of manufacture refers to the number of copies of an identical product that need to be manufactured at one time.

Match the different scales of production to the correct definition.

ONE OFF

Identical products are made together in groups. The size or appearance can be changed between different batches.

BATCH

Large quantities of identical products are made, with the same product being made over and over again.

MASS

Involves making one product at a time. This could be a prototype or a product made for a specific customer.

One off



Advantages

Batch



Advantages

Disadvantages

Disadvantages

Mass



Advantages

Continuous



Advantages

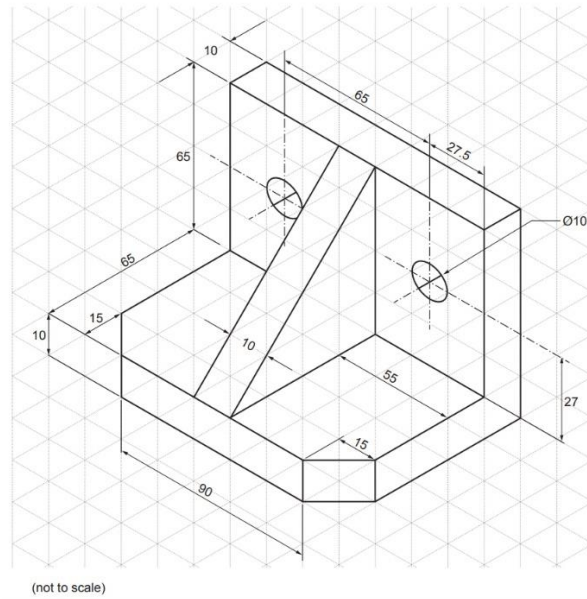
Disadvantages

Disadvantages

Product	Picture of product	Scale of production (1 mark)	Reasons why (2 marks)
Metal screw			
Cath Kidston limited edition lampshade			
Green Christmas baubles			
World Cup football			
Personalised silver necklace			
Scissors			
Argos Book			

Task seven: Communicating Design

The diagram below shows an isometric drawing of a bracket.



1. In the space provided, draw the shape of the top view in third angle orthographic projection.

2. The overall bracket length is 120 mm. Add this dimension to your drawing in part using the correct engineering drawing conventions.
3. Other than dimensions and hidden details, identify two pieces of information that would be shown on an orthographic drawing.

(i)

(ii)

4. Identify the abbreviation used for 'across flats' in engineering drawings.

.....

5. Identify the symbol used to denote diameter in an engineering drawing.

6. Explain what is meant by the term third angle projection.

.....

.....

.....

7. Draw the symbol used to show an engineering drawing has been drawn using third angle projection

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Complete the table below regarding your reflections of the assessment preparation booklet.

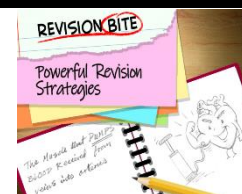
The key areas that I have improved my knowledge and understanding are in the following:



The types of questions (e.g. multiple choice, source work, extended writing) I have improved in the most are:



The main type of revision method I used is (e.g. cue cards, mind mapping, key words, repetitive testing):



Further revision that I need to complete is:



Teacher's reflection:



Signed: