

Name _____

Class _____

Date _____

By the end of this worksheet I can...

- ☐ explain how models are used to generate and explore, test and refine, and communicate
- ☐ describe the purpose of, and information gained from, test rigs and prototypes
- ☐ explain the use of computer models and simulations
- ☐ describe the benefits and drawbacks of rapid prototyping

I DO

Worked example Read how a full-mark answer is built

1 Describe how physical models can be used during the design of a product. (4 marks)

Full-mark answer each ✓ is one mark

Sketch models made quickly from card let the designer try out several forms and check proportions early on ✓. A block model can be held to test the grip and button positions against hand sizes ✓. A test model or rig can check strength and stability, so faults are found before tooling is made ✓. A scale model shows the size of a large product relative to a person ✓.

Examiner tip: 2025 commentaries credited four distinct purposes; naming types alone and CAD models scored 0.

Why marks are not awarded

"Sketch models, block models, prototypes and CAD models."

0 marks: naming model types scores nothing, and computer models are not physical models.

WE DO

Guided practice Use the starters and word bank to help you

2 Discuss how designers use a variety of models during the design process. Link each to the stage, purpose and information gained. (8 marks)

Sentence starters

Scale models: ...

Computer models and simulations: ...

Word bank

sketch · explore · client · generate · refine ·
proportion · models · ergonomics

Tip: Marked in bands: cover several stages, each with an example and why it is used.

YOU DO

On your own No notes. Check your answers afterwards.

3 Quick check: tick one box for each.

- An architect shows a new school building to the council. Which model?
☐ Scale model ☐ Sketch model ☐ Block model ☐ Computer-generated model
- Which is a benefit of simulation?
☐ It uses the real material, so results are exact ☐ It needs no computer or special software ☐ Testing without risk to users or the environment ☐ It is always cheaper and quicker than sketching
- Why are sketch models used early in the design process?
☐ They show exactly what the final finish will be ☐ They are quick and low cost to make and change ☐ They are fully working and can be user tested ☐ They are used to set up mass production
- Which model would a designer use to test the comfort of a handle grip?
☐ Scale model ☐ Exploded drawing ☐ Sketch model of a different product ☐ Block model

4 Key terms: write the letter of the matching description next to each term.

1. Sketch model	___	A Solid, non-working model showing shape and form; often used to test ergonomics.
2. Block model	___	B A model that looks and/or works like the final product, used for final testing before production.
3. Scale model	___	C Easy to change, realistic, can produce drawings and link to CAM/3D printing.
4. Computer-generated model benefit	___	D Model at a different scale for objects too large or small to model full size.
5. Prototype	___	E Quick, low-cost model from scrap materials to generate and explore ideas.

5 Explain what is meant by 'Simulation'. (2 marks)

6 Describe one drawback of rapid prototyping. (2 marks)

Check and reflect

Mark your answers with the answer sheet. Go back to the checklist on the site and re-rate each "I can" statement above. Which one still needs work?
