

Name _____

Class _____

Date _____

By the end of this worksheet I can...

- ☐ describe the benefits and drawbacks of CAM
- ☐ describe the uses, benefits and drawbacks of laser cutters
- ☐ describe the uses, benefits and drawbacks of 3D printers

I DO

Worked example Read how a full-mark answer is built

1 Describe four benefits of using a laser cutter to manufacture products. (4 marks)

Full-mark answer each ✓ is one mark

It cuts very accurately from the CAD file ✓. Every part is identical, so it is repeatable ✓. It can cut intricate internal shapes that are hard to cut by hand ✓. It can also etch and engrave detail such as logos ✓.

Why marks are not awarded

"It is quick, cheap and easy."

0 marks: unqualified "quick/cheap/easy" never score.

WE DO

Guided practice Use the starters and word bank to help you

2 Outline three benefits of 3D printing when producing products. (3 marks)

Sentence starters

One ... is ...

Another ... is ...

A third ... is ...

Word bank

needed · moulds · tooling · file · moving ·

one-off · CAD · complex

Tip: 3 marks = 3 separate, developed points.

YOU DO

On your own No notes. Check your answers afterwards.

3 Quick check: tick one box for each.

a) Which product suits laser cutting?

- ☐ Acrylic earrings with intricate cut-outs ☐ A hollow plastic kayak for the river ☐ A blow-moulded plastic drinks bottle ☐ A die-cast metal toy car body

b) Which is a drawback of CAM?

- ☐ Poor repeatability between parts ☐ Lower accuracy than hand tools ☐ It cannot run without an operator ☐ High initial investment and training

c) A laser-cut plywood edge can be identified by...

- ☐ Ejector pin marks ☐ Flashing ☐ Brown scorch marks ☐ Rough sand texture

d) Why is 3D printing suited to prototypes?

- ☐ It is the fastest process for thousands of parts ☐ No moulds are needed so changes are low cost and quick ☐ It only uses metal ☐ It gives a perfect smooth finish

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

1. CAM	_____	A Accurate, repeatable, fast; runs 24/7; reduces labour.
2. CAM benefit	_____	B Computer-aided manufacture: machines controlled from CAD data.
3. CAM drawback	_____	C High cost of machines, software, training and maintenance.
4. Laser cutter drawback	_____	D Limited to flat sheet; scorch marks; fumes; expensive.

The design team used CAD to develop a new bike frame.

5 Explain the benefits of using CAD in the development of products such as the bike frame. (4 marks)

6 Describe one benefit of 3D printing. (2 marks)

7 Describe one drawback of 3D printing. (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?
