# Unit 106: Introduction to emerging technologies in construction and the built environment sector

# Worksheet 6: 3D printing (tutor)

1. What is a 3D printer? How does it work and what materials does it use to print?

A 3D printer is computer-controlled sequential layering of plastics or metal to create 3D shapes.

1. What is another name for 3D printing in construction?

Additive Manufacturing (AM)

or

Autonomous Robotic Construction System (ARCS)

1. Name the three stages to print concrete:
2. Data Preparation
3. Concrete Preparation
4. Component Printing
5. Name three limitations of 3D printing buildings.

Any of these points:

* 3D printing currently only prints walls (vertical elements).
* Horizontal, flat planes such as roof and floor are STILL assembled on-site.
* Hardware and software for operations is specialist.
* Technology needs to be developed to be in line with architect’s and designer's software.
* Development of the hardware to produce high-rise built assets needs further development.
* 3D printed elements need to integrate with other building components.
* A solution for restricted city centre sites is required.
* Huge investment needed.
* Fewer jobs.

1. Name three benefits of 3D printing buildings.

Any of these points:

* On-site and off-site printing is possible.
* Can be used in harsh or dangerous conditions.
* More efficient, take less time.
* Sustainable capabilities (use of local materials).
* The process produces less waste, and even zero waste in some cases.
* Reduction of manual labour used on-site, leading to cost savings.
* Reduced logistic / transport costs.
* Reduced storage required.
* No double handling of materials on-site.
* A 3D printer can work 24 hours a day, 7 days a week.
* The design possibilities are endless.