Unit 202: Changing practices over time (learner)

# Worksheet 3: 21st century construction techniques

**Task 1**: Defining sustainability

1. Without using the internet, define sustainability in 20 words or less:

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1. Explain what is meant by embodied energy in relation to construction materials.

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1. Fill in the gaps using the list of words provided.

Energy efficiency and \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ are critical for achieving the zero-carbon target in construction. Energy \_\_\_\_\_\_\_\_\_\_ involves designing buildings that minimise energy consumption through efficient systems and technologies. This reduces carbon \_\_\_\_\_\_\_\_\_\_ and offers \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Embodied energy refers to the energy \_\_\_\_\_\_\_\_\_\_ throughout a building's life cycle, including materials extraction, manufacturing and transportation. By choosing low-embodied-energy materials and \_\_\_\_\_\_\_\_\_\_ construction practices, the \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ of the building can be minimised. By \_\_\_\_\_\_\_\_\_\_ energy efficiency and considering embodied energy, \_\_\_\_\_\_\_\_\_\_ projects contribute to the goal of \_\_\_\_\_\_\_\_\_\_ carbon emissions, promoting \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_, reducing reliance on \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ and creating\_\_\_\_\_\_\_\_\_\_ friendly built environments.

cost savings efficiency construction environmental sustainability emissions embodied energy carbon footprint integrating zero sustainable fossil fuels environmentally consumed

**Task 2:** The Well-being of Future Generations (Wales) Act 2015​

Fill in the gaps using the words provided.

The Well-being of Future Generations (Wales) Act 2015 is a law in Wales that aims to promote the well-being of present and future generations. It requires \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_, including those in the construction industry, to consider the \_\_\_\_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_ impact of their \_\_\_\_\_\_\_\_\_\_ and take actions that contribute to the Act's well-being goals. In relation to the construction industry, the Act emphasises \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, requiring projects to be designed and executed with \_\_\_\_\_\_\_\_\_\_ in mind. It promotes \_\_\_\_\_\_\_\_\_\_ and integration among different \_\_\_\_\_\_\_\_\_\_, including local communities, and encourages long-term thinking to future-proof construction projects. The Act also outlines well-being objectives that public bodies, businesses and organisations, including construction organisations, must work towards, such as \_\_\_\_\_\_\_\_\_\_, health, \_\_\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_\_\_and\_\_\_\_\_\_\_\_\_\_. Construction companies involved in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ need to report on their progress towards achieving the well-being goals, ensuring \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_. By aligning their activities with the Act's \_\_\_\_\_\_\_\_\_\_, the construction industry can contribute to a more sustainable and \_\_\_\_\_\_\_\_\_\_ future for Wales and its future generations.

public bodies sustainability objectives long-term stakeholders transparency sustainable development collaboration public projects decisions prosperous accountability prosperity resilience equality

**Task 3**: Answer the following true or false questions on the Well-being of Future Generations (Wales) Act 2015. Circle the correct answer.

1. The Act focuses on the actions of public bodies.

**True or False**

1. The Act focuses on building and site safety.

**True or False**

1. The Act helps the construction industry contribute to a more sustainable, resilient and prosperous future.

**True or False**

1. The Act places a strong emphasis on sustainable development.

**True or False**

**Task 4**: Modern Methods of Construction (MMC): Answer the following questions about MMC and construction.

List four different types of MMC used in construction.

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**Task 5:** Identify five different benefits of off-site construction and explain how these are benefits reduce environmental impact?

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**Task 6**: 21st century construction technology

Read the following statements on BIM vs traditional processes and decide whether they are true or false. **Circle** the correct response.

1. In traditional design processes, each discipline works independently without sharing information.

**True or False**

1. BIM allows for improved collaboration and communication among project stakeholders.

**True or False**

1. BIM can help identify and resolve design clashes and conflicts before construction begins.

**True or False**

1. Traditional design processes rely heavily on 2D drawings and manual coordination, which can lead to errors and delays.

**True or False**

1. Traditional design processes are more efficient and cost-effective compared to BIM.

**True or False**

1. BIM enables the creation of detailed virtual models that can simulate construction processes and aid in project visualization.

**True or False**

1. In traditional design processes, each discipline works independently with limited sharing information.

**True or False**

1. Traditional design processes rely heavily on 2D drawings and manual coordination.

**True or False**

1. Traditional design processes rely heavily on 2D drawings and manual coordination.

**True or False**

1. Traditional design processes provide a higher level of accuracy and consistency in project documentation.

**True or False**

**Task 7:** Identify if the following statements relate to either traditional or modern surveying methods. **Circle** the correct response.

1. Uses measuring tools like chains, compasses and theodolites

**Traditional or Modern**

1. Uses GPS, laser scanning and aerial photography

**Traditional or Modern**

1. Has limited accuracy and is more time consuming and labour intensive

**Traditional or Modern**

1. This method offers greater precision, quicker data collecting

**Traditional or Modern**

1. This method can generate information to be used in 3D and 2D models.

**Traditional or Modern**

**Task 8:** List three potential limitations of current 2D and 3D software.

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