

Sustainable Housing

Sustainable housing is about designing and building homes that are good for people and the planet. This includes using eco-friendly materials, saving energy, and reducing waste.

It also considers the needs of different people, and ensures that sustainable transport options can be easily reached.

Sustainable homes can be more expensive to build at first, but they save money over time, for example by using less energy.

The Sustainable Development Goals

The 17 Sustainable Development Goals (SDGs) were adopted by the United Nations in 2015 as a call to “end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity”. Find out more here:

<https://www.undp.org/sustainable-development-goals>.

Sustainable housing and the SDGs

Sustainable housing directly supports these goals by reducing energy use and making cities greener. This links to SDGs such as:

SDG 11 (Sustainable Cities and Communities) making cities and human settlements inclusive, safe, resilient and sustainable.

SDG 7 (Affordable and Clean Energy) ensuring access to affordable, reliable, sustainable and modern energy for all.

SDG 13 (Climate Action) taking urgent action to combat climate change and its impacts.

Land use

Sustainable housing is not just about what we build, but how we use land. Detached houses take up a lot of space because each home sits on its own plot.

This leads to **urban sprawl**, where cities spread over large areas, increasing the need for roads, transportation, and causing more pollution.

Mid-rise apartment blocks, for example, use land much more efficiently, housing multiple families in space that might only fit one or two detached homes.

By housing more people in a smaller area, mid-rise apartments reduce the need for additional infrastructure, lower energy use per person, and make public transportation more accessible.



Image by Thomas Murray, used with permission.

Building design

Sustainable housing design includes:

- **Energy efficiency** such as having good insulation to keep heat in during winter and out during summer.
- **Renewable energy sources** such as solar panels or wind turbines, instead of relying on fossil fuels.
- **Water conservation** features such as low-flow toilets, rainwater collection systems, and greywater recycling (reusing water from sinks or showers for other purposes).

Building with **sustainable materials** such as recycled wood or bamboo, which grows quickly and doesn't harm the environment as much as cutting down trees or using lots of concrete.

Different homes for different needs to meet the requirements of a range of people and families. Some people will need to avoid steps, for example, and some families will need more bedrooms than others (what other needs can you think of?).

Accessible links to sustainable transport such as good paths, cycle storage and shared electric cars.

You might also like to try our sessions on Solar Panels and Water Resources.

Green roofs are with vegetation like grass and shrubs.



Image: [Valentina Zotova](#) from [Pixabay](#)

They provide **natural insulation**, helping buildings stay warm in winter and cool in summer, reducing energy needs.

They also **absorb rainwater**, reducing runoff and helping prevent flooding in cities, and filter the air by absorbing pollutants and producing oxygen, making the area healthier.

Green roofs also **create habitats** for birds, insects, and other wildlife, supporting biodiversity in urban areas.

Minecraft Challenge



Design a **mid-rise apartment block** in Minecraft that supports sustainable living.

Think about using **eco-friendly materials**, **energy-saving features**, and **community spaces**.

For example, you could add **green roofs** and **community gardens** to enhance biodiversity and provide fresh food, and shared spaces like **gyms** and **libraries** to encourage community interaction. How will all these features be sustainable?

How can you make your building **efficient** and **comfortable** for everyone? Think about different people and their needs. For example, what might a young family need? Or a wheelchair user?

How will you provide access to **sustainable travel options**?

You could use:

- some of the engineering techniques we have covered
- your own ideas

If you do not have access to Minecraft you could:

- draw your design
- build your own using simple materials.

Not an official Minecraft resource. This project was supported by the Royal Academy of Engineering under the *Ingenious Awards* scheme. Developed with Rachel Kirkwood. For educational use only. Contact: sciencehunters@uwe.ac.uk.