

SuDS

Sustainable Drainage Systems (SuDS) are natural methods of intercepting, slowing and holding water to reduce flooding, improve water quality, support biodiversity and increase public amenity.

SuDS solutions

- Installing a water butt
- Making a rain garden
- Having a permeable drive
- Growing a green roof
- Keeping plants and lawns in our gardens
- Having permeable surfaces like gravel instead of paving, decking or concrete
- Growing real lawns and not artificial grass



Green roofs

Green roofs are flat, or gently sloped roofs, covered in plants. What do you think are their advantages?

- Holding rain water and reducing run-off
- Building insulation
- Offering a habitat for birds and insects
- Helping improve urban air quality
- Aesthetic benefits

Find out about the differences between natural drainage and urban drainage and list them here.

Natural drainage

- Reduces flooding by holding water back
- Allows infiltration into the ground
- Protects and enhances water quality
- Provides natural habitats for wildlife
- Encourages natural groundwater replenishment
- Create pleasant green and blue amenity spaces to relax and play
- Provides opportunities to use runoff water where it falls

Traditional drainage

- Rapid surface water run-off, contributing to urban flooding
- Little infiltration into the ground
- Leads to increased pollution from run-off
- Reduces habitat for wildlife
- Doesn't allow groundwater replenishment
- No green and blue spaces for people to enjoy nature and relax
- Runoff water is lost so more treated water has to be used.

Design your own green roof!

- What plants would you grow there?
- What animals would you hope to attract?
- What do you think are the benefits of a green roof?
- Can you think of any disadvantages?

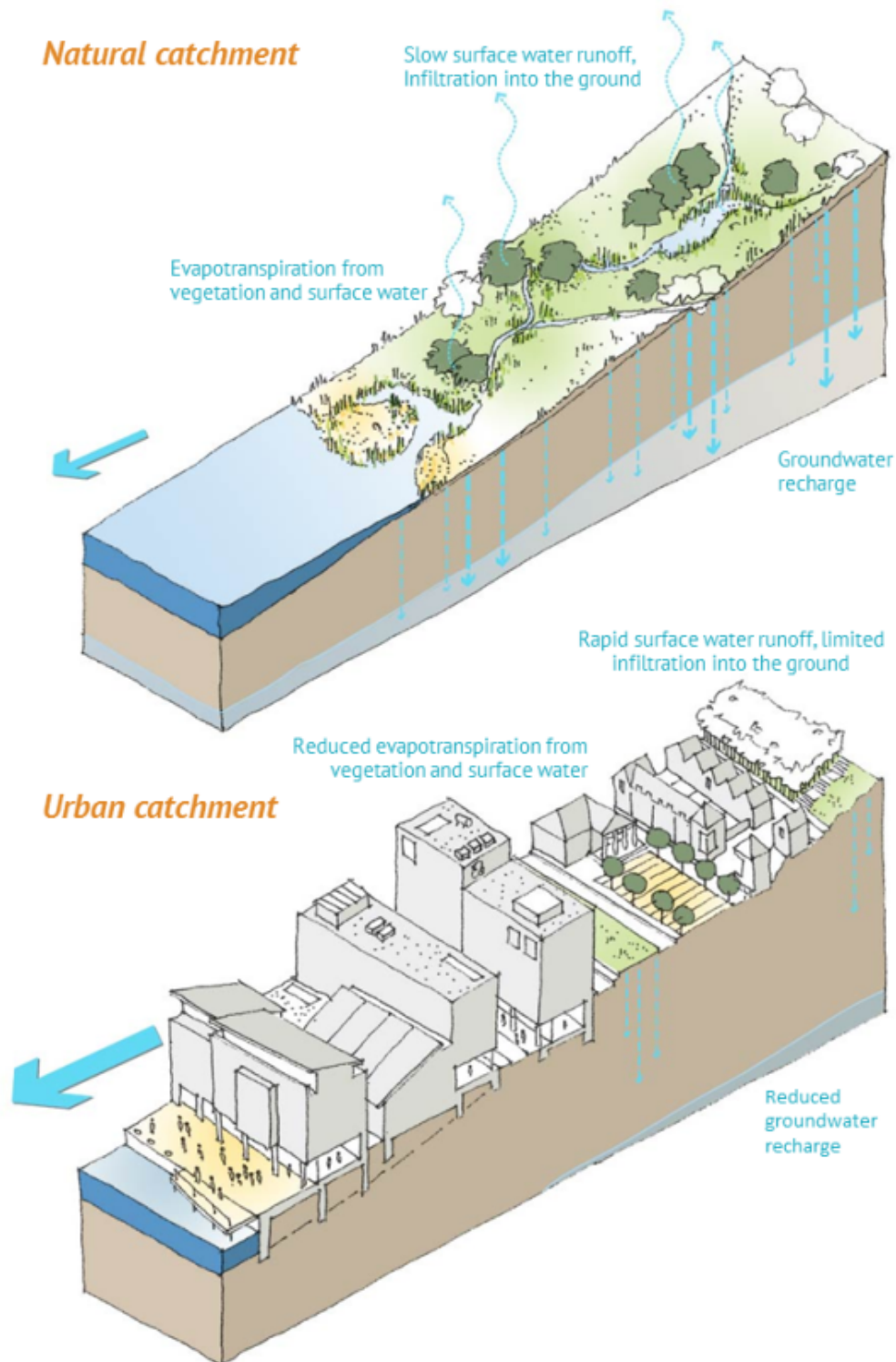
Do some research, make notes and then draw your design with labels, or produce a presentation.

You can find out more about green roofs by visiting these websites:

www.livingroofs.org

www.renewableenergyhub.co.uk

This diagram demonstrates the impacts of urbanisation on a catchment by reducing its permeability and increasing surface water runoff. This reduces opportunities for water to be managed naturally with the potential for pollution and localised flooding when the piped systems cannot cope with rainfall.



Supporting Information for Green Roof Designs

What plants would you grow there?

A simple green roof might be planted with sedums, but if the roof is installed on a strong structure, green roofs can support lawns, wildflower meadows, and even shrubs and trees. Some urban roofs are used to grow food, and supply vegetables to local restaurants. Native plants are better than non-natives, as native plants support a greater biodiversity of native species of animals. Sowing native wildflower seeds will encourage pollinators.

What animals would you hope to attract?

A wide range of insects which are found on dry grasslands, will live on the plants on a green roof. If the green roof is sown with a mix of wildflower seeds, pollinators such as bees and hoverflies will be attracted.

Ground-nesting bird species such as skylark, little ringed plover, black-headed gulls and oystercatchers could make their homes there, and starlings, goldfinches and wagtails should come to feed.

What are the benefits of a green roof?

- They store water, so reduce flooding in urban environments
- They improve insulation so are good for energy efficiency because buildings will require less heating in winter and less air-conditioning in summer
- They reduce the heat released in cities, so are good at adding to the cooling of urban areas.
- They can improve biodiversity
- They provide amenity areas and breathing spaces for people living in urban areas
- They utilize rainwater and therefore reduce the surface runoff in urban areas
- They help to improve air quality as the plants absorb carbon dioxide and pollutants
- They provide natural sound insulation

Disadvantages of green roofs

Depending on what is planted on the roof, they will require regular maintenance. If there are lawns, they might require mowing (although fewer mows means greater biodiversity), and vegetables would require irrigation.

Intensively planted green roofs will require a stronger structure to support the soil, plants and water.

Green roofs provide a stressed environment for the plants, as soils are thin and the effects of sun and wind can be very drying, so plants have to be able to withstand periods of drought.