

GCSE TO A-LEVEL PROGRESSION

ENVIRONMENTAL SCIENCE

The following activities cover some of the key skills from GCSE science that will be relevant at A-level. They include the vocabulary used when working scientifically and some maths and practical skills.

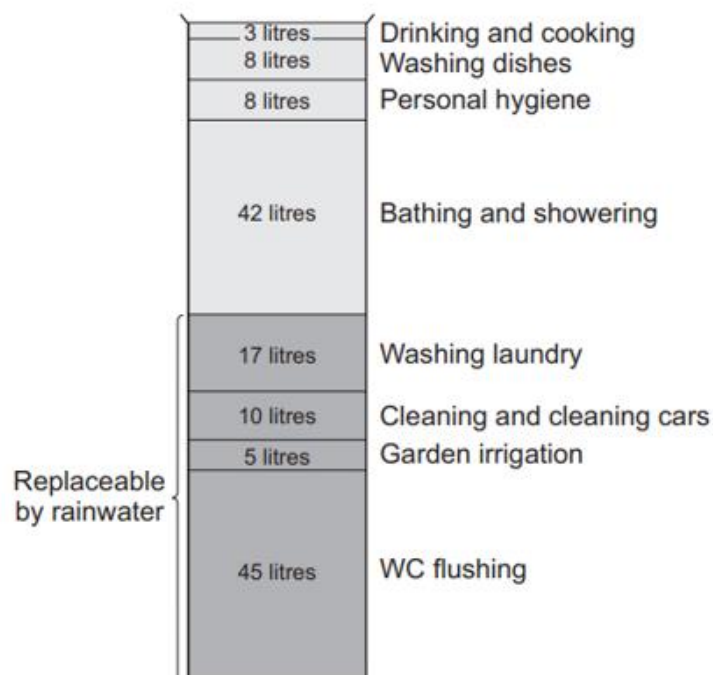
The activities are **not a test**. Try the activities first and see what you remember and then use textbooks or other resources to answer the questions. **Don't** just go to Google for the answers, as actively engaging with your notes and resources from GCSE will make this learning experience much more worthwhile.

1. In East Anglia, the average annual rainfall is 0.55 m.

A house in East Anglia has a flat roof with an area of 120 m².

If 75% of the rain falling on the roof is collected, what volume of rainwater would be collected in one year?

2. The diagram shows the amount of water typically used in the home, in the UK, in one day.



Calculate the percentage (%) of water use that is potentially replaceable by using rainwater.

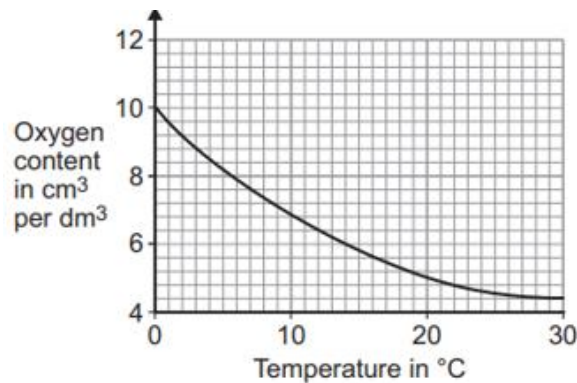
3. In 2017, the city of Manchester began a 'City of Trees' project. The project plans to plant 3 million trees over the next 25 years.

It was suggested that the council plant 3.6×10^5 trees in the first year. The rest of the trees would be planted in equal numbers over the remaining years.

Calculate how many trees would need to be planted in each of the remaining years.

Give your answer in standard form.

4. Wildlife in rivers is affected by changes in conditions. The graph below shows how the oxygen content of water changes with temperature.



- a) Describe the relationship between the oxygen content and temperature.
- b) Does the data show a positive or negative correlation?
- c) Calculate the change in oxygen content when the temperature of water is increased from 0 °C to 14 °C.
5. CO₂ can be added to the air in a greenhouse where tomatoes are growing. This increases the rate of photosynthesis.

Explain why increasing CO₂ levels to very high concentrations will no longer increase the rate of photosynthesis.

6. Explain how the abiotic factors temperature, humidity and air flow affect the rate of transpiration in plants.
7. For every decrease of 1 on the pH scale, the concentration of H⁺ ions increases by a factor of 10.

For example, an acid of pH 4 has 10 times the concentration of H⁺ ions than that of an acid of pH 5.

The pH of two soil samples was analysed.

Soil A = pH 4

Soil B = pH 7

By what factor is the concentration of H⁺ ions greater in soil A than soil B?

8. Life cycle assessments (LCAs) assess the environmental impact of the entire lifetime of a product. State the four stages of a product's life cycle that can be assessed.
9. Urban lifestyle and industrial processes produce large amounts of waste water that require treatment before being released into the environment.

State the different stages involved in the treatment of sewage.

10. Energy efficiency is important in environmental science. For example, improvements in efficiency means less energy is wasted and so less fossil fuel needs to be combusted, meaning fewer greenhouse emissions.

An electric fan is supplied with 1500 kJ of energy. 500 kJ is wasted as thermal energy.

Calculate the % energy efficiency of the electric fan.

11. Describe two advantages and two disadvantages of using wind as an energy resource instead of coal.
12. Write out the seven types of electromagnetic radiation in order of increasing wavelength