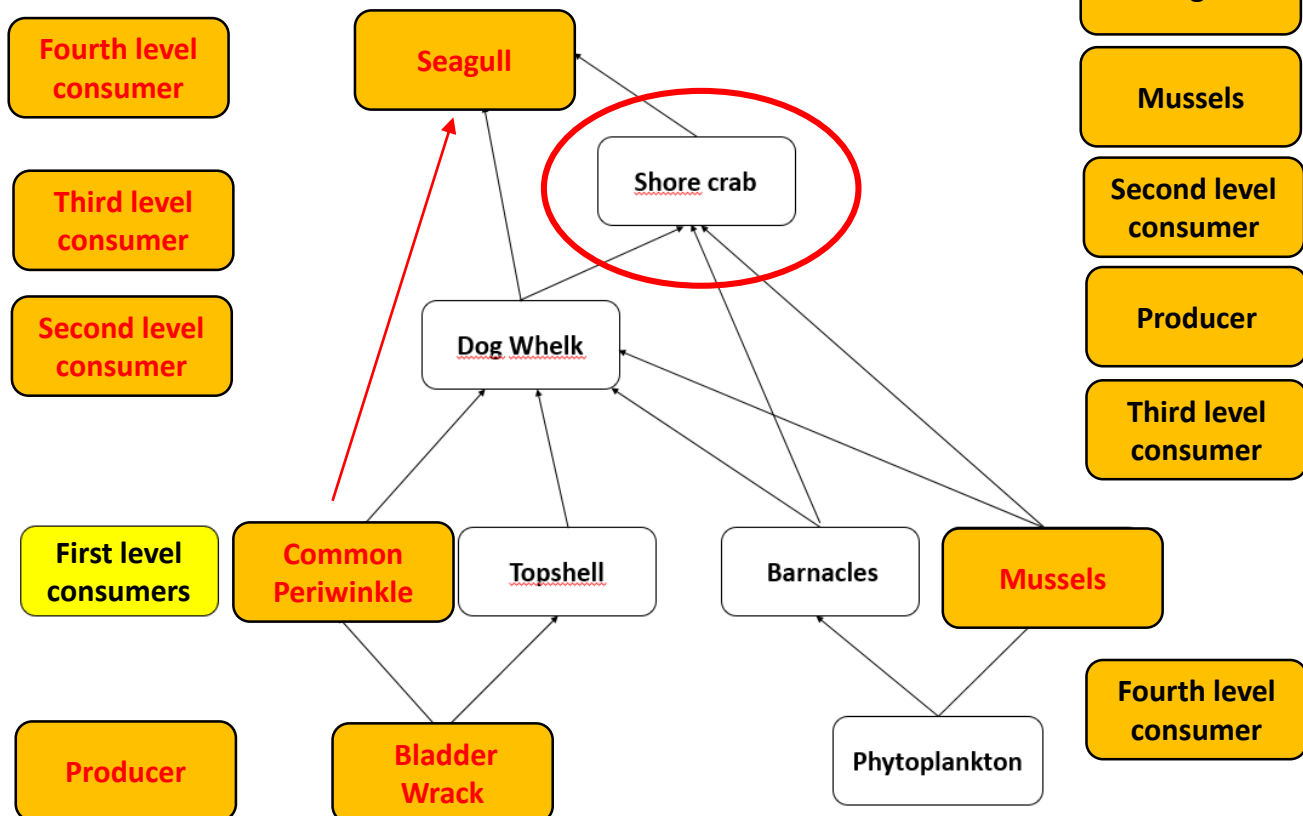


1. Food webs

Use your knowledge from the fieldtrip to complete the food web below:

- Label producers, first, second and third level consumers.
- Complete the food web with the organisms in orange on the right.
- Connect one of the first level consumers to the top predator.
- Circle one carnivore on the food web.



What do all producers have in common?

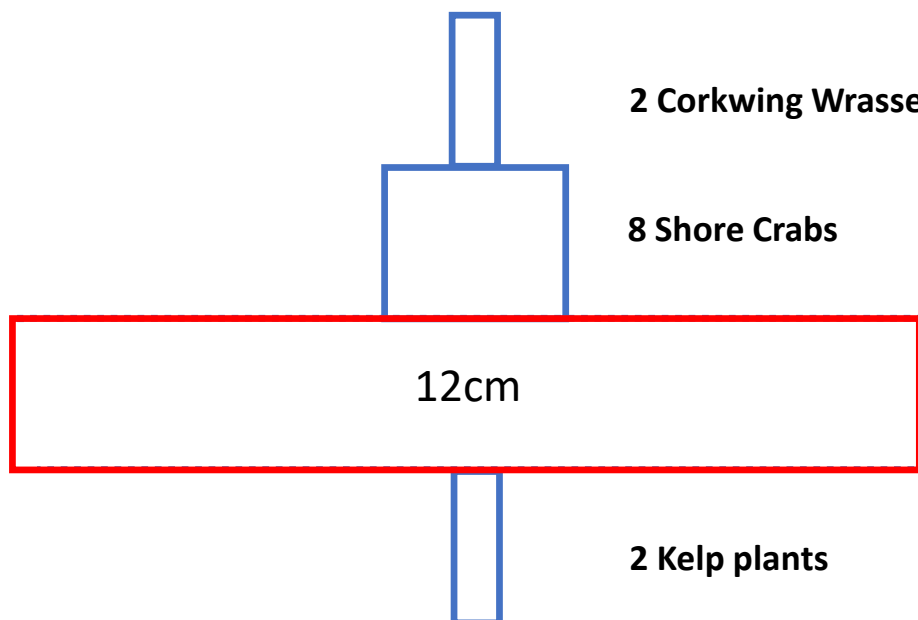
They all get their energy (for the process of photosynthesis) from sunlight.

What do the arrows in a food web represent?

They represent the transfer of energy between trophic levels in a food chain/web.

2. Pyramids of numbers

Complete the pyramid of numbers below to show 40 Topshells as first level consumers.



Why is this not a good way of showing the energy at different trophic levels in the food chain?

2 kelp plant contain a lot more energy than the trophic levels above.

What would be a better way of representing this, that would create a true pyramid shape?

A better way of presenting this would be using a pyramid of biomass.

Why do the number of organisms get smaller as you move further up through a food chain?

Energy has been transferred out of the food chain e.g. as heat from respiration at each trophic level.

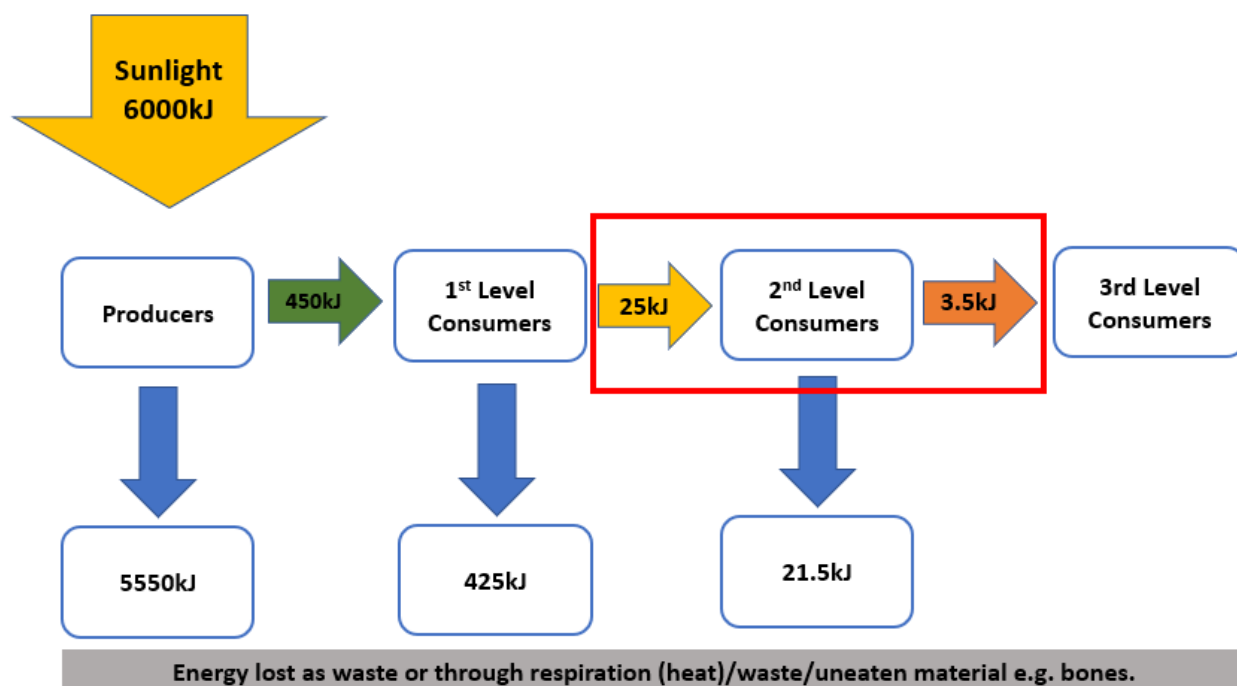
Organisms use energy for growth of new cells, which other way do they use energy?

Repair of damaged tissue.

Which other ways is energy lost at each level in a food chain?

As waste in the form of heat from respiration, Faeces and urine.

Energy efficiency in food chains.



Calculate the efficiency of 2nd level consumers in the food chain above:

Follow this format that we used to calculate the efficiency of first level consumers in our example:

$$25\text{kJ} \div 450\text{kJ} \times 100 = 5.6\% \text{ efficiency}$$

$$3.5\text{kJ} \div 25\text{kJ} \times 100 = 14 \% \text{ efficiency}$$

Now try working out how efficient producers are at trapping energy from the sun. Use the space below to show your working:

$$6000\text{kJ} \div 450\text{kJ} \times 100 = 7.5\%$$