Enzymes

1. What is an enzyme? What do they do?

2. What temperature do human enzymes work best at?

3. We call this _____ temperature.

4. What happens to enzymes if the temperature gets too high or it is the wrong pH?

5. What happens to enzymes if the temperature gets too low?

6. What is digestion?

Fill in the gaps.

Enzyme	Substrate (what it breaks down)	Products (broken down into…)	Where made in the body
Amylase (carbohydrase)			Salivary gland, small intestine, pancreas
	Proteins		
		Fatty acids and glycerol	

Fill in the gaps

Type of enzymes	Product it is used in	reason
Protease and lipase	Biological washing powder	
	Baby foods	Pre-digests protein in meat
Isomerase		Converts glucose into fructose. Fructose is sweeter than glucose so less is needed, so the drink/snack contains less energy.

We can make fructose from corn starch or other vegetable starch using 2 enzymes.

An enzyme called a_____ (carbohydrase) is added to starch solution.

This converts the starch into g_____. Another enzyme called i_____ is

added to the glucose solution to convert it into fructose solution.

Homeostasis (keeping a constant internal environment)

Controlling waste

Use these missing words to complete the 2 paragraphs

Lungs bloodstream liver cell urine respiration bladder kidneys bloodstream

Urea is made in the _____ when amino acids are broken down. It travels in the _____, is removed by the _____, and is stored in the _____ until it is removed from the body as _____.

Carbon dioxide is made in every _____ in the body during _____. It travels in the _____ where it is removed by the _____ when we breathe out.

Controlling body temperature

Body temperature is monitored by the _____ _____ in the brain and receptors in the _____.

Too hot or too cold?	How the body responds	How it helps
Too cold	S_____	Rapid muscle c_____ releases heat from r_____ in the muscle cells.
Too cold	Blood vessels in the skin c_____ (narrow)	Less blood flows to the skin surface, so less heat is lost by radiation.
Too cold	H_____ stand on end	Traps warm _____next to the skin.
Too hot	S_____	Water evaporates taking heat from the skin.
Too hot	Blood vessels in the skin d_____ (widen)	More blood flows to the skins surface, so more heat is lost by r_____.

Use the words in the box to fill in the gaps in the table.

Dilate constrict contraction air respiration sweating shivering radiation hairs

Controlling blood glucose levels

Write these sentences out in the correct order to explain how blood glucose levels are controlled.

- Eat a meal
- Insulin makes the liver take in glucose and store it as glycogen.
- Pancreas detects the rise in blood glucose levels
- Blood glucose levels rise
- Blood glucose level re Pancreas releases insulin into the bloodstream
- turns to normal

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Diabetes

1. Diabetics don't produce enough or any _____ from their _____.

2. Diabetics control their blood glucose levels by injecting themselves with _____, and by controlling their _____ (the food they eat).

3. If blood glucose levels get too low a diabetic can fall unconscious and go into a _____.

4. Which organ makes and releases insulin?

5. How is glucose stored in the liver?

6. How does insulin get from the pancreas to the liver?

Stem cells

Stem cells are undifferentiated. What does this mean?

What is special about stem cells?

Where are stem cells found?

How might stem cells help someone with liver disease?

What ethical issues are there with stem cell research?

Inheritance

Use the words from the box to complete the sentences.

Meiosis	gametes	46	fertilisation	mitosis	chromosomes	divides	23

Normal body cells have _____ chromosomes (___ pairs of chromosomes).

Sperm and egg cells (also called _____) have 23 chromosomes.

After sex, sperm and egg cells can join together. This is called _____.

The fertilised egg cell now contains 46 _____.

This 1 cell then grows and _____ to make a baby made up of billions of cells.

This kind of cell division is called _____. It produces genetically identical daughter cells.

The gametes (sperm and egg cells) are made by a type of cell division called _____.

Use the letters X, X, X and Y to complete the sentence.

Boys have _____ sex chromosomes. Girls have _____ sex chromosomes.

1. What causes cystic fibrosis? What are the health problems? How is it treated?

2. How is Huntington's disease different to cystic fibrosis?

3. Draw a genetic cross diagram to show the chances of two people who are carriers of the cystic fibrosis gene having a child who is a sufferer.

4. Who was Gregor Mendel?
5. Why were his ideas about inheritance not recognised until after his death?

Cells

1. Draw and label an animal cell.

2. Draw and label a plant cell.

Part of cell	What it does
Nucleus	
Cytoplasm	
Cell membrane	
Mitochondria	
Ribosomes	
Cell wall	
Chloroplast	
vacuole	

Cell part Found in animal and cells	Cell part Found in plant cells only

Draw a sperm cell.
Explain how it is adapted to do its job

Draw a palisade cell from a leaf.
Explain how it is adapted to do it its job.

Diffusion

This diagram shows 2 cells containing and surrounded by oxygen molecules.

A  B 

Into which cell will oxygen diffuse fastest?
Explain why.

Out of which cell will oxygen diffuse fastest?
Why?

Cross out the wrong word.
Diffusion is the net movement of particles from an area where they are at a Higher/lower concentration to an area where they are at a Higher/lower concentration. This is called a concentration gradient.

1. What is osmosis?

2. How is osmosis different to simple diffusion?

3. What will happen to a potato chip if it is placed into pure water? Explain why.

4. What will happen to a potato chip if placed in very concentrated salt solution? Explain why.

Photosynthesis

Word equation for photosynthesis

_____ _____+ water (+ light energy) ⟶ glucose + _____

- Light energy is absorbed by c_____, a green pigment found inside some chloroplasts in plant cells.
- The light energy is used to convert carbon dioxide and water into g_____(sugar).
- O_____ gas is released as a by-product

1. What 3 factors can limit the rate of photosynthesis?

2. Draw a graph to show how temperature limits the rate of photosynthesis. (clue, it is very similar to the graph for carbon dioxide concentration.

3. What does it mean when the rate of photosynthesis stops increasing (curve levels off) even though the temperature is still increasing?

4. What do plants convert the glucose into that they make during photosynthesis?

5. Plants make glucose then use some of it to release energy by r_____.

Plant nutrients

Nutrient/mineral	Why plants need it	Deficiency symptoms (what happens if the plant doesn't get that mineral)
Nitrate		**Stunted growth**
Magnesium		**Yellow leaves**

Energy flows

Blackbirds eat slugs that feed on cabbages. Hawks eat blackbirds.

Put these organisms into a food chain.

_____ → _____ → _____ → _____

Put these organisms into a pyramid of biomass.

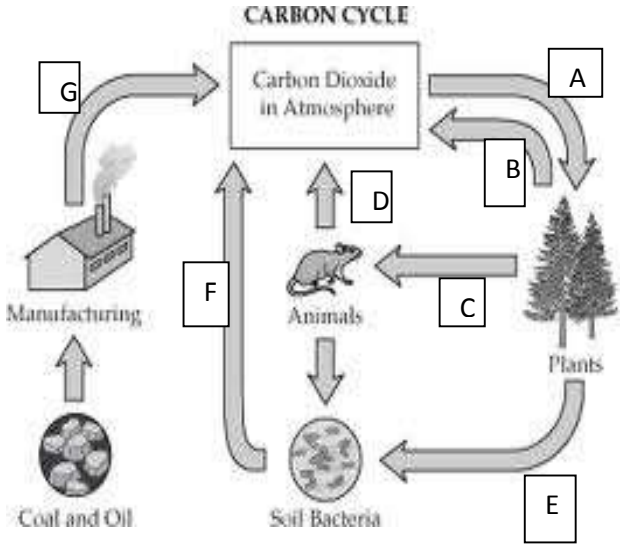
There is always less biomass at each stage going up in a food chain.

1. How is energy lost at each stage in a food chain?

2. Pigs get bigger more quickly when you keep them inside heated barns and restrict their movement than when they are kept outdoors, and free to roam. Why is this?

3. A field of corn could feed 100 people for a year. The same amount of corn fed to chickens could only feed 10 people for a year. Why is this?

The carbon cycle



Name the processes in the carbon cycle

A =

B=

C=

D=

E=

F=

G=

Use words from the box below (some may be used more than once)

Respiration	death and decay	photosynthesis	combustion(burning)	feeding

Use words from the box to fill in the gaps

Proteins	**respire**	**microorganisms**	**carbon dioxide**	**atmosphere**	**carbon**

Carbon dioxide is removed from the _____ by green plants for photosynthesis.

The carbon from the carbon dioxide is used to make carbohydrates, fats and _____ which make up the body of plants.

− Some of the carbon dioxide is returned to the atmosphere when green plants _____.

− when green plants are eaten by animals, some of the _____ becomes part of the fats and proteins which make up their bodies.

− when animals respire some of this carbon becomes _____ _____ and is released into the atmosphere.

− when plants and animals die, some animals and _____ feed on their bodies. Carbon is released into the atmosphere as carbon dioxide when these organisms respire.

<u>What conditions do microbes prefer?</u>

Compost heaps are made up of kitchen scraps and grass cuttings etc. Microorganisms (decomposers) rot the plant material quicker under certain conditions.

1. Why does compost break down quicker in summer than in winter?

2. Why does compost break down quicker if you regularly dig the compost over or mix in bulky screwed up newspaper?

3. Why does compost break down quicker if the compost heap is kept moist?