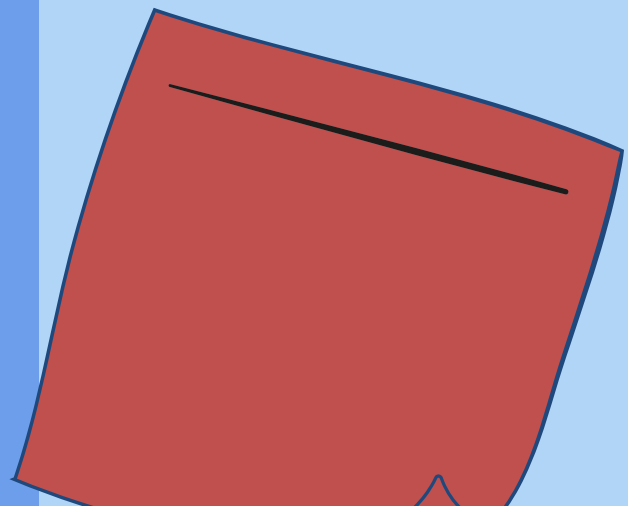
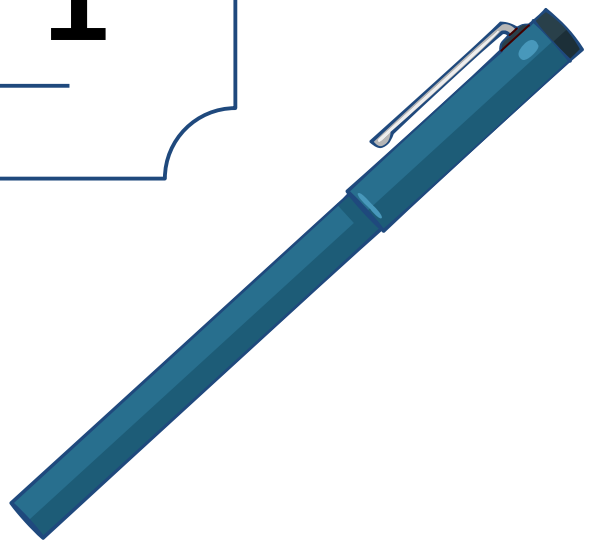
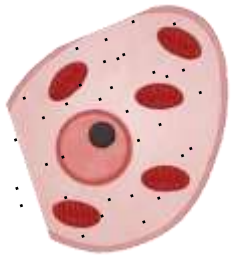
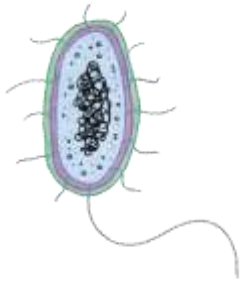
Year 10 Summer catch up, Biology paper 1





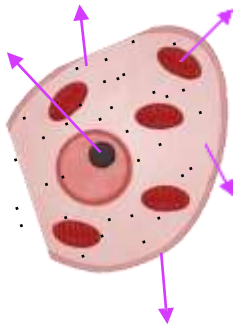
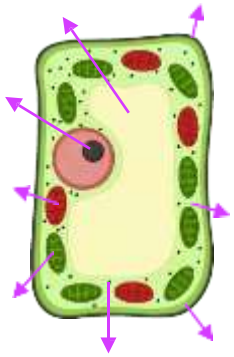
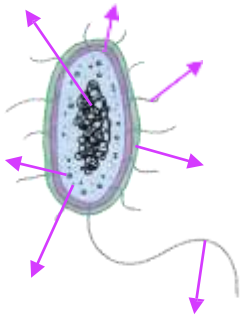
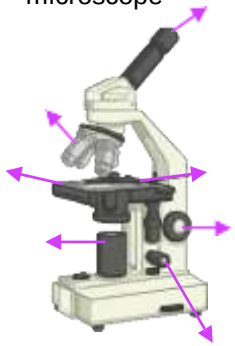
CELL BIOLOGY

MNSP Science

Label the animal cell 	Label the plant cell 	Label the bacterial cell 	Label the parts of the microscope 	What are the two types of microscope? Write down the formula used to calculate the magnification of an object
Name the part of the cell where protein synthesis occurs	Name the part of the cell where DNA is found	Name the part of the cell where aerobic respiration takes place	Name the part of the cell which absorbs light energy for photosynthesis	Why can ribosomes not be seen under the microscope?
What term is used to describe the movement of particles from a high concentration to a low concentration?	What term is used to describe the movement of water from a high concentration to a low concentration through a semi-permeable membrane?	What term is used to describe the movement of particles from a low concentration to a high concentration using energy?	What will happen to the mass and length of a piece of potato when it is placed into a highly concentrated sugar solution?	What will happen to the mass and length of a piece of potato when it is placed into a highly diluted sugar solution?
Why do root hair cells no contain any chloroplasts?	Explain how a sperm cell is adapted to its function	What are stem cells?	Name two places where human stem cells are found	Name the place where plant stem cells are found

CELL BIOLOGY

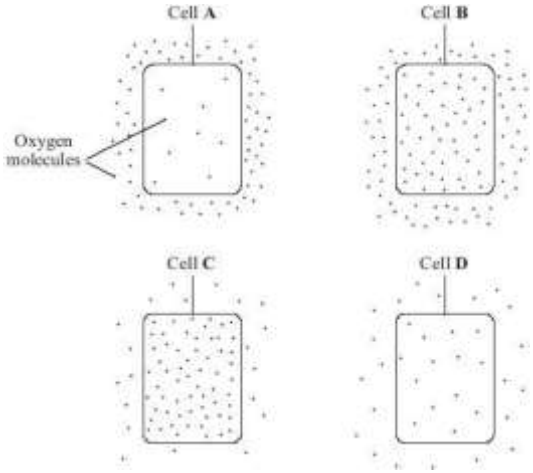
MNSP Science

Label the animal cell 	Label the plant cell 	Label the bacterial cell 	Label the parts of the microscope 	What are the two types of microscope? Light microscopes and electron microscopes Write down the formula used to calculate the magnification of an object magnification =image size ÷ actual size
Name the part of the cell where protein synthesis occurs Ribosomes	Name the part of the cell where DNA is found Nucleus	Name the part of the cell where aerobic respiration takes place ftitochondria	Name the part of the cell which absorbs light energy for photosynthesis Chloroplasts	Why can ribosomes not be seen under the microscope? They are too small
What term is used to describe the movement of particles from a high concentration to a low concentration? Diffusion	What term is used to describe the movement of water from a high concentration to a low concentration through a semi-permeable membrane? Osmosis	What term is used to describe the movement of particles from a low concentration to a high concentration using energy? Active transport	What will happen to the mass and length of a piece of potato when it is placed into a highly concentrated sugar solution? The mass and length will decrease	What will happen to the mass and length of a piece of potato when it is placed into a highly diluted sugar solution? The mass and length will increase
Why do root hair cells no contain any chloroplasts? There is no light for them to photosynthesise under the soil	Explain how a sperm cell is adapted to its function Has flagella – to swim ftany mitochondria – energy for movement Enzymes in head – break down egg cells jelly coating	What are stem cells? Cells that have not become specialised yet	Name two places where human stem cells are found Embryonic fluid and bone marrow	Name the place where plant stem cells are found fteristem

EXAM EXPOSURE

MNSP Science

The diagrams show cells containing and surrounded by oxygen molecules. Oxygen can move into cells or out of cells.



Into which cell, A, B, C or D, will oxygen move the fastest?

Why might stem cells from human embryos be more useful than stem cells from adults?

Diffusion is an important process in animals and plants.

The movement of many substances into and out of cells occurs by diffusion.

Describe why diffusion is important to animals and plants.
In your answer you should refer to:

- animal's
- plant's
- examples of the diffusion of named substances.

EXAM EXPOSURE

MNSP Science

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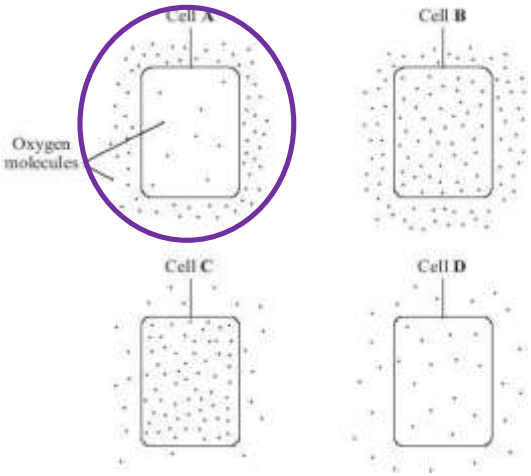


Into which cell, A, B, C or D, will oxygen move the fastest?

Why might stem cells from human embryos be more useful than stem cells from adults?

Embryonic stem cells can turn into many types of cell, but adult bone marrow stem cells can only differentiate into limited types of cell.

Diffusion is an important process in animals and plants.
The movement of many substances into and out of cells occurs by diffusion.
Describe why diffusion is important to animals and plants.
In your answer you should refer to:

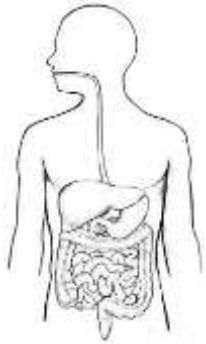
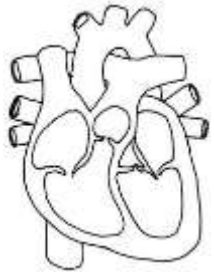
- *to take in substances for use in cell processes*
- *products from cell processes removed*

Examples of processes and substances:

- *for gas exchange / respiration: O2 in / CO2 out*
- *for gas exchange / photosynthesis: CO2 in / O2 out*
- *food molecules absorbed: glucose, amino acids, etc*
- *water absorption in the large intestine*
- *water lost from leaves / transpiration*
- *water absorption by roots*
- *mineral ions absorbed by roots*
- *movement of particles / molecules / ions*
- *through a partially permeable membrane*
- *(movement of substance) down a concentration gradient*
- *osmosis: turgor / support / stomatal movements*

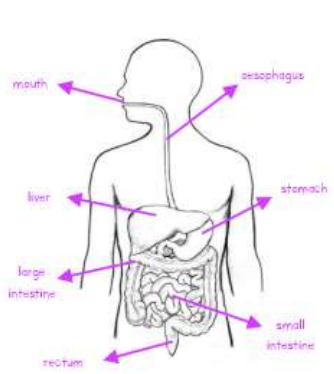
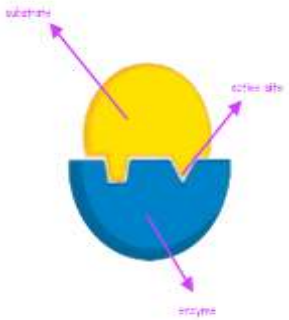
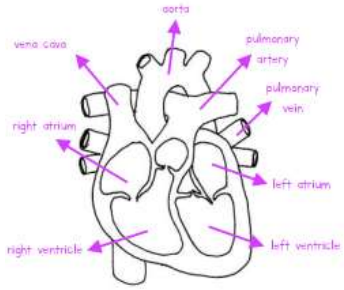
ORGANISATION

MNSP Science

Label the digestive system 	Label the parts of the enzyme substrate complex 	Label the the parts of the heart 	Name the five levels of organisation in living organisms	What is described as a group of cells with similar structure and function?
			What is described as a group of tissues working together to perform a specific function?	What is described as a group of organs working together to perform a specific function?
Name three enzymes that are produced in the pancreas	What substance neutralises stomach acid and emulsifies fat during digestion?	What enzyme is released with the saliva to break down carbohydrates?	Where are nutrients absorbed into the bloodstream?	How are alveoli adapted for gas exchange?
State the four components of blood	What feature do veins have to stop the backflow of blood?	Which blood vessel carries blood into the heart from the body?	Which blood vessel takes blood from the heart to the lungs?	Where are pacemaker cells found?
What are the two types of tumour?	Give two risk factors of CHD	What is the process by which plants release water out of their stomata?	State two ways leaves are adapted for gas exchange	What is the name of the cells that surround the stomata?

ORGANISATION

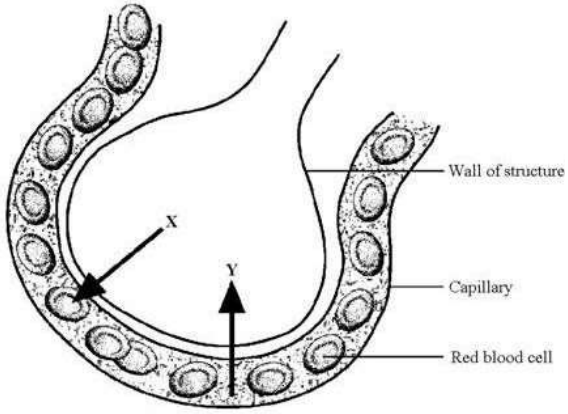
MNSP Science

Label the digestive system 	Label the parts of the enzyme substrate complex 	Label the the parts of the heart 	Name the five levels of organisation in living organisms Cell, tissue, organ, organ system, organism	What is described as a group of cells with similar structure and function? Tissue
			What is described as a group of tissues working together to perform a specific function? Organ	What is described as a group of organs working together to perform a specific function? Organ system
Name three enzymes that are produced in the pancreas Protease, lipase, amylase	What substance neutralises stomach acid and emulsifies fat during digestion? Bile	What enzyme is released with the saliva to break down carbohydrates? Amylase	Where are nutrients absorbed into the bloodstream? Small intestine	How are alveoli adapted for gas exchange? Large surface area, good blood supply, thin moist walls and large diffusion gradient
State the four components of blood Red blood cells, white blood cells, platelets and plasma	What feature do veins have to stop the backflow of blood? Valves	Which blood vessel carries blood into the heart from the body? Vena cava	Which blood vessel takes blood from the heart to the lungs? Pulmonary veins	Where are pacemaker cells found? Right atrium
What are the two types of tumour? Benign and malignant	Give two risk factors of CHD Smoking, poor diet and stress	What is the process by which plants release water out of their stomata? Transpiration	State two ways leaves are adapted for gas exchange Large surface area, thin, large networks of veins and stomata	What is the name of the cells that surround the stomata? Guard cells

EXAM EXPOSURE

MNSP Science

The diagram shows an alveolus. The arrows show the direction of the gases exchanged. Name gas X and gas Y.



Different organs in the digestive system have different functions.
Draw one line from each function to the organ with that function.

Function	Organ
Digestion of fat	Large intestine
Absorption of water into the blood	Liver
Production of hydrochloric acid	Small intestine
	Stomach

Different parts of the human digestive system help to break down molecules of fat so that they can be absorbed into the body.
Describe how.
To gain full marks you should refer to:

- the enzyme and where the enzyme is produced
- the products of digestion
- any other chemicals involved.

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MNSP Science

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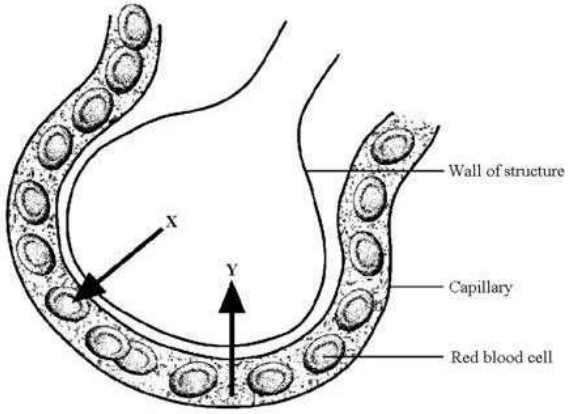

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- any other chemicals involved.

- mechanical breakdown in mouth / stomach
- fats →fatty acids and / or glycerol
- by lipase
- (produced by) pancreas
- and small intestine
- fat digestion occurs in small intestine
- bile
- produced by liver
- neutralises acid from stomach
- produces alkaline conditions in intestine
- refs. to increased surface area related to emulsification or chewing
- products are small molecules / water-soluble
- products absorbed by small intestine

INFECTION AND RESPONSE

MNSP Science

What is a communicable disease?	What is a non-communicable disease?	What is a pathogen?	State the four types of pathogen	How can pathogens spread?
Name a viral disease	Name a bacterial disease	Name a fungal disease	Name a protist disease	How do bacteria make you ill?
How do viruses make you ill?	What is the term for an organism that spread disease by carrying pathogens between people?	State the physical barrier to infection in your body	State the part of the body containing strong acid to kill pathogens	State the part of the body that secretes mucus to trap pathogens stopping them from entering the lungs
What three things can white blood cells do to kill pathogens?	What type of drug is used to treat bacterial disease?	What disease is where layers of fatty material build up in the arteries, narrowing them and reducing oxygen flow?	Which treatment consists of a device inserted into a blocked artery to keep it open and allow blood and oxygen to the heart?	Which treatment consists of drugs that reduce blood cholesterol levels, slowing the rate of fatty material build up in arteries?
How can faulty heart valves be treated?	Give two risk factors that can affect health	What is cancer?	What are the two types of tumour?	What is the name for a substance that can cause cancers to develop?

INFECTION AND RESPONSE

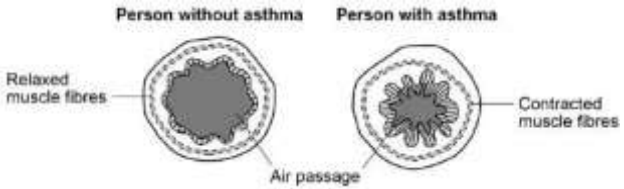
MNSP Science

What is a communicable disease? A diseases that can be passed from person to person	What is a non-communicable disease? A diseases that cannot be passed from person to person	What is a pathogen? A disease causing organism	State the four types of pathogen Bacteria, virus, fungus and protists	How can pathogens spread? Direct contact, water, air, unhygienic food preparation and vectors
Name a viral disease Tobacco mosaic virus, HIV and measles	Name a bacterial disease Gonorrhoea and salmonella	Name a fungal disease Rose black spot	Name a protist disease ftalaria	How do bacteria make you ill? Produce toxins that make you ill
How do viruses make you ill? Rapidly reproduce inside cells damaging and destroying them	What is the term for an organism that spread disease by carrying pathogens between people? Vector	State the physical barrier to infection in your body Skin	State the part of the body containing strong acid to kill pathogens Stomach	State the part of the body that secretes mucus to trap pathogens stopping them from entering the lungs Nose, trachea and bronchus
What three things can white blood cells do to kill pathogens? Produce antitoxins, antibodies and engulf pathogens	What type of drug is used to treat bacterial disease? Antibiotics	What disease is where layers of fatty material build up in the arteries, narrowing them and reducing oxygen flow? CHD	Which treatment consists of a device inserted into a blocked artery to keep it open and allow blood and oxygen to the heart? Stent	Which treatment consists of drugs that reduce blood cholesterol levels, slowing the rate of fatty material build up in arteries? Statins
How can faulty heart valves be treated? Replace faulty valves with mechanical valves	Give two risk factors that can affect health Diet, alcohol, smoking and carcinogens	What is cancer? Uncontrolled growth of cells	What are the two types of tumour? Benign and malignant	What is the name for a substance that can cause cancers to develop? Carcinogens

EXAM EXPOSURE

MNSP Science

The image shows cross-sections of bronchioles of two people. Suggest why people with asthma often find it difficult to breathe.



Use the correct ***word*** to complete the sentence.

antibodies ***antitoxins*** ***toxins***

Bacteria and viruses make us feel ill because they produce

_____.

bacteria ***viruses*** ***fungi***

Antibiotics are medicines that kill

_____.

short of food ***invade*** ***cells*** ***mutate***

New strains are produced when pathogens are

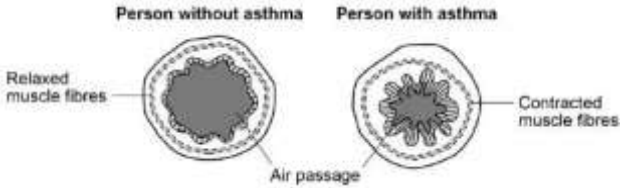
._____.

Dravet syndrome causes epileptic seizures. An epileptic seizure is caused by unusual brain activity. Describe the processes that then need to happen to test the new drug before it can be used to treat all children with Dravet syndrome.

EXAM EXPOSURE

MNSP Science

The image shows cross-sections of bronchioles of two people. Suggest why people with asthma often find it difficult to breathe.



- narrow(er) / small(er) (air) passages / bronchioles
- less air / oxygen can pass through

Use the correct ***word*** to complete the sentence.

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Bacteria and viruses make us feel ill because they produce

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Dravet syndrome causes epileptic seizures. An epileptic seizure is caused by unusual brain activity. Describe the processes that then need to happen to test the new drug before it can be used to treat all children with Dravet syndrome.

- pre-clinical trials of the new drug on cells / tissues / live animals
- to test for toxicity / dosage / efficacy
- clinical trials / tests on healthy volunteers
- clinical trials / tests on children with Dravet syndrome at very low doses
- so you can monitor for safety / side effects
- and only after these stages trial to find optimum dosage / test for efficacy
- trial could be double blind / use a placebo
- which does not contain the new drug
- children with Dravet syndrome would be randomly allocated to the test groups
- so no one knows who has the drug / placebo
- comparison to existing drugs
- peer review of data
- to help prevent false claims
- approval by NICE

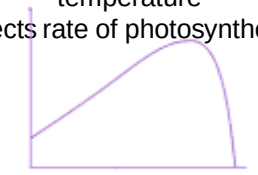
BIOENERGETICS

MNSP Science

Name the pigment found in chloroplasts that absorbs light energy	State the word equation for photosynthesis	Which substance needed for photosynthesis is taken in by osmosis in the root hair cells?	What type of energy is needed for photosynthesis to occur?	What are the three limiting factors of photosynthesis?
What does aerobic mean?	State the word equation for aerobic respiration	How does oxygen enter cells?	Where does aerobic respiration occur?	What is the purpose of respiration?
What does anaerobic mean?	State the word equation for anaerobic respiration	What is the term for the amount of oxygen the body needs after exercise to react with lactic acid?	What substance used in baking bread releases carbon dioxide to make the bread rise?	When does anaerobic respiration occur?
Which product of anaerobic respiration causes muscle fatigue?	Which type of respiration is more efficient?	Why do you breathe heavily when you exercise?	Why do you breathe heavily even after you have exercised?	Give two uses of glucose in cells.
What word is used to describe all the chemical reactions happening in an organism?	How does the body supply the muscles with more oxygenated blood?	What is anaerobic respiration in yeast cells called?	What do organisms need energy for?	Sketch the graph showing how temperature affects rate of photosynthesis

BIOENERGETICS

MNSP Science

Name the pigment found in chloroplasts that absorbs light energy Chlorophyll	State the word equation for photosynthesis Carbon dioxide + water ❼glucose + oxygen	Which substance needed for photosynthesis is taken in by osmosis in the root hair cells? Water	What type of energy is needed for photosynthesis to occur? Light energy	What are the three limiting factors of photosynthesis? Light intensity, CO_2 levels and temperature
What does aerobic mean? Lots of oxygen present	State the word equation for aerobic respiration Oxygen + glucose ❼carbon dioxide + water	How does oxygen enter cells? Diffusion	Where does aerobic respiration occur? ftitochondria	What is the purpose of respiration? Provide energy to the cell
What does anaerobic mean? Little or no oxygen present	State the word equation for anaerobic respiration Glucose ❼lactic acid (in animals) Glucose ❼ethanol + carbon dioxide (in plants and yeast)	What is the term for the amount of oxygen the body needs after exercise to react with lactic acid? Oxygen debt	What substance used in baking bread releases carbon dioxide to make the bread rise? Yeast	When does anaerobic respiration occur? When there is very little or no oxygen present
Which product of anaerobic respiration causes muscle fatigue? Lactic acid	Which type of respiration is more efficient? Aerobic respiration	Why do you breathe heavily when you exercise? ftuscles need more energy from respiration	Why do you breathe heavily even after you have exercised? Increase oxygen supply to react with lactic acid in muscle cells	Give two uses of glucose in cells Respiration, cellulose to strengthen cell wall, produce amino acids for protein synthesis, stored as fat or oil and converted to insoluble starch for storage
What word is used to describe all the chemical reactions happening in an organism? ftetabolism	How does the body supply the muscles with more oxygenated blood? Heart rate, breathing rate and breath volume increases	What is anaerobic respiration in yeast cells called? Fermentation	What do organisms need energy for? Building large molecules in chemical reactions, muscle contraction for movement and keeping warm	Sketch the graph showing how temperature affects rate of photosynthesis 

EXAM EXPOSURE

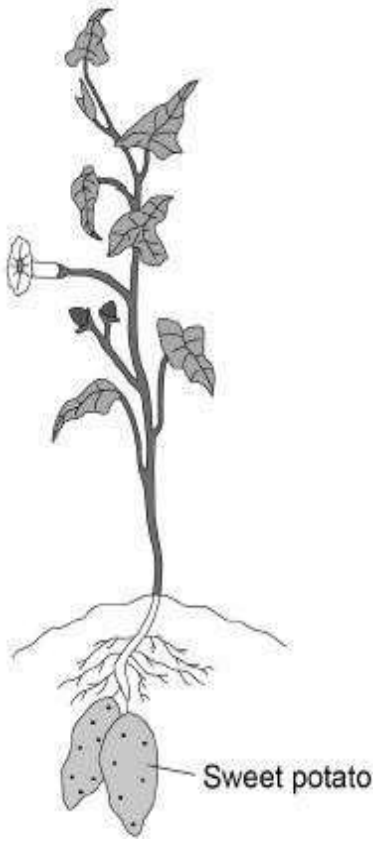
MNSP Science

Respiration can happen aerobically or anaerobically.
Respiration transfers energy from glucose.
Draw one line from each type of respiration in human cells to the

Type of respiration in human cells	Information
	Produces ethanol
Aerobic respiration	Uses oxygen
Anaerobic respiration	Uses carbon dioxide
	Produces lactic acid

Aerobic respiration and anaerobic respiration are the two types of cell respiration.
Give three differences between aerobic and anaerobic

The sweet potatoes found underground contain starch.
Explain how starch in the sweet potato is produced from carbon dioxide in the air.



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Aerobic respiration and anaerobic respiration are the two types of cell respiration.
Give three differences between aerobic and anaerobic

- uses / needs / requires oxygen (and anaerobic does not)
- transfers more energy (than anaerobic)
- produces carbon dioxide / water (anaerobic does not)
- does not produce lactic acid (anaerobic does)
- does not cause an oxygen debt (anaerobic does)

allow aerobic takes place in mitochondria and anaerobic takes place in cytoplasm
allow converse in terms of anaerobic

The sweet potatoes found underground contain starch.
Explain how starch in the sweet potato is produced from carbon dioxide in the air.

- carbon dioxide enters the leaf through stomata
- glucose / sugars produced by photosynthesis (in leaves)
- some detail of photosynthesis
- transport / translocation (of glucose / sugars)
- in phloem
- glucose is converted to starch
- (starch is a) long chain of glucose / sugar molecules
- starch as storage (of glucose / sugars)