8B3 Microbes and Disease - Essential Knowledge Sheet

Types of pathogen

1. Bacteria enter the body and multiple rapidly. Are living cells that produces toxins which make us feel ill.
2. Virus are not living. Infect our cells and reproduce inside them. The cells burst open and cause us to feel ill.
3. Fungi Are thread like structures that infect people and plants.

Disease transmission

Transmission Route	Example of pathogen
Airborne droplets	Influenza
Contaminated food	Salmonella
Direct contact	Fungi athletes foot
Contaminated water	Cholera
Blood barrier (unborn babies)	HIV

Defence against disease

Feature	How it protects us from disease
Tears	Antibacterial properties
Stomach	Contains acid to kill micro-organisms
Hairs in nose	Trap micro-organisms
Cilia	Wafts the micro-organisms away from the respiratory system
Skin	Wafts the micro-organisms away from the respiratory system

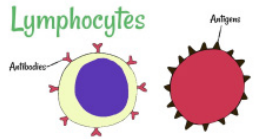
Growing microbes

1. Use aseptic technique to culture microbes.
2. Wipe down all work surfaces with disinfectant.
3. Light a Bunsen burner to create a clear zone.
4. Transfer the bacteria onto an agar plate.
5. Lift the lid slightly so that the plate isn't contaminated with other bacteria.
6. Seal the lid of the petri dish and incubate the bacteria at 37˚C for 3 days.

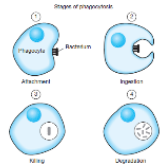
37˚C bacteria slightly 3 lid

aseptic technique Bunsen burner

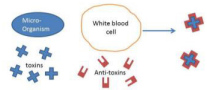
Immune System



1. Produce antibodies specific to the antigen on the pathogen. Target the cell for destruction.



2. The white blood cell engulfs the pathogen. It digests it and uses the products inside the body.



3. White blood cells may produce antitoxins which bind to toxins produced by the microbe.

Vaccines

Pros	Cons
• Cannot die from some diseases	• May cause some side effects
• Cannot pass on diseases to others	• May have a phobia of needles
• May only feel ill for a short period of time	• Can feel ill when you first have the vaccine

Antibiotics

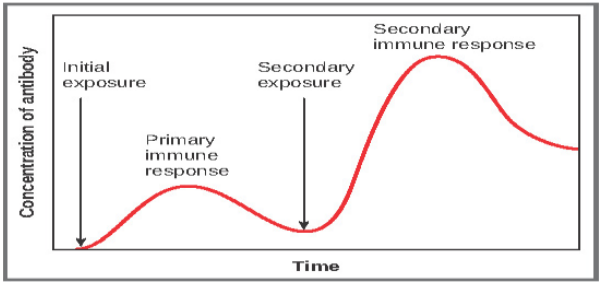
Fill in the gaps

Antibiotics only work on bacteria . They do not kill viruses as these pathogens live inside our own cells. We can test antibiotics on bacterial plates and look at their clear zone. The bigger the clear zone indicates the better the antibiotic. Some pathogens are resistant to antibiotics .

Some pathogens mutate and which means they are not killed when treated with certain antibiotics. Patients may need to go back to the doctors to get another type of antibiotic MRSA is an example of a superbug that is resistant to multiple types of antibiotic.

Immunity

Explain the difference in antibody production before and after a vaccination.



When given a vaccine the number of antibodies in the blood stream increase as the white blood cells are stimulated to produce them against the pathogen. Some of the antibodies are stored in memory cells. When you come into contact with the pathogen your antibodies are produced at a faster rate to kill the pathogen. They also remain in the blood for longer.

8C1—Atoms and Elements - Essential Knowledge Sheet

From the 6 following substances identify:

Silver, Hydrogen, Water
Carbon Dioxide, Air, Sulfur

Metal Element - **Silver**
Compound - **Carbon Dioxide/Water**
Gas Element - **Hydrogen**
Mixture of Gases - **Air**

Copper Sulfate has the formula $CuSO_4$:
How many elements are in copper sulfate? **3**
Name the elements in copper sulfate? **Copper/Sulfur/Oxygen**
How many atoms are there in copper sulfate? **6**

Complete the word equations when the following elements react together.

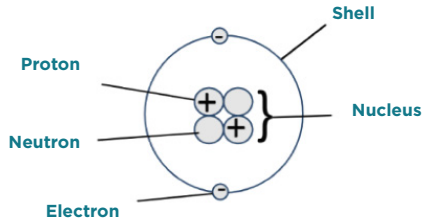
Iron + Oxygen ⟶ **Iron Oxide**
Sodium + Chlorine ⟶ **Sodium Chloride**
Potassium + Sulfur ⟶ **Potassium Sulfide**

All the elements are arranged in the periodic table.
Which side are the metals on? **Left and Centre**
Which side are the non-metals on? **Right**
Which is the first element in the periodic table? **Hydrogen**
What order are the elements in the periodic table? **Atomic Number**

What are the symbols for the following elements:
Sulfur - **S**
Oxygen - **O**
Sodium - **Na**
Potassium - **K**
Gold - **Au**

Label the diagram with the following 5 terms

Nucleus Proton Neutron Electron Shell



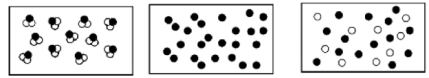
Label the diagram with the following 5 terms

Define the following three word.

Atom – **A small particle that can't be broken into any-thing smaller**
Element – **A substance made from 1 type of atom**

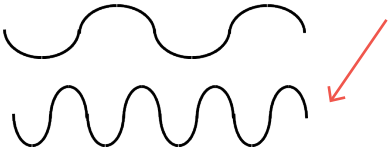
Compound – **A substance made from two or more-different types of atoms joined together in a fixed proportion**

Identify the element, compound and mixture diagrams.

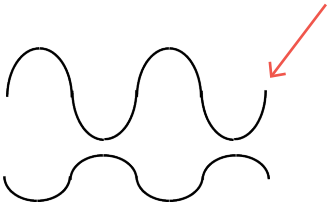


8P3—Magnetism & Sound

Which one of these waves would have the highest pitch?



Which one of these waves would have the loudest volume?



How we hear sound

• Vibrating air particles are funnelled into the ear through the pinna

• This causes the ear drum to vibrate. These vibrations are passed to the bones of the middle ear.

• Then the tiny hairs in the cochlea vibrate. The hairs are connected to nerve cells that carry the signal to the brain Where it is processed as sound.

Words : Hairs, ear drum, particles, hairs, brain, bones

Label the ear diagram with the following:

Pinna Hammer

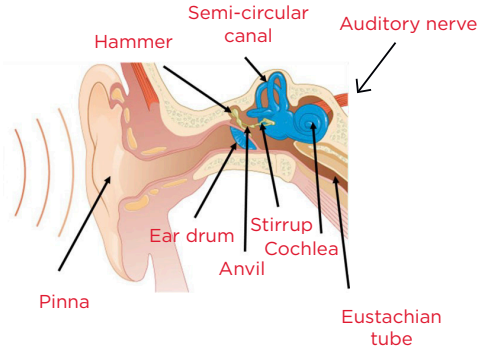
Anvil Cochlea

Stirrup

Semi-circular canals

Ear drum

Eustachian tube



If two identical magnets attract each other, label the poles.

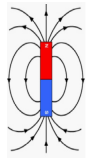
N	S
S	N

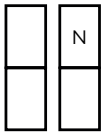
Draw the magnetic field on the bar magnet.

Where is the magnetic field strongest? At the poles

What materials will stick to the magnet?

Iron
Nickel
Cobalt

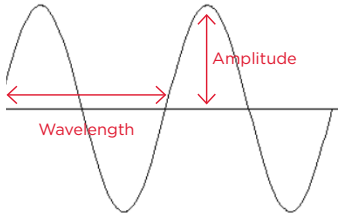


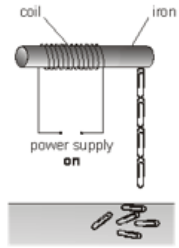


One of the magnets has its poles labelled. Describe how you could find out which pole is which on the other, unlabelled magnet.

Put the magnets together. You know the north pole of one of the magnets, so if you put the end of the other next to it and it repels, then it is the north pole. If it attracts, it is the South pole.

Add the following to the diagram:
Wavelength, Amplitude





An electromagnet is made when a wire carrying an electric current is wrapped around an iron nail.

What is an advantage of using an electromagnet rather than a permanent magnet?

It can be switched off and made stronger and weaker.

How could the electromagnet be made stronger?

Add more coils
Increase the diameter of the wire
Increase the diameter of the core
Change the shape of the core to a horseshoe

The frequency of sound is measured in Hertz (Hz)

The range of human hearing is about ...20Hz. To about 20,000Hz.

Sounds that have a higher frequency than this are known as ...ultrasounds...

8B1 Food and Digestion - Essential Knowledge Sheet

Balanced Diet

Complete the table

Nutrient Group	What it is needed for	Examples
Protein	Growth and repair	Meat, cheese, eggs
Carbohydrate	Energy	Bread, pasta
Fat	Energy and insulation	Butter, Chocolate, avocado
Fibre	Keep substances moving in the digestive system	Granola, fruit and fibre
Vitamins	Chemical reactions	Oranges
Minerals	Chemical reactions	Meat, milk
Water	Chemical reactions	Water

Organisation of the digestive system

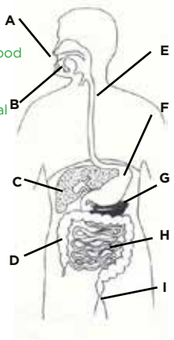
Label the organs in the digestive system.
Include a description of what each does.

A. Mouth mechanical digestion of food

B. Salivary gland chemical digestion releases enzymes

C. Liver produces bile

D. Large intestine - Aabsorbes water



E. Oesophagus transports foods to the stomach

F. Stomach churns food, releases proteases

G. Pancreas releases all enzymes

H. Small intestine releases all enzymes

I. Anus where undigested food is release

Food tests

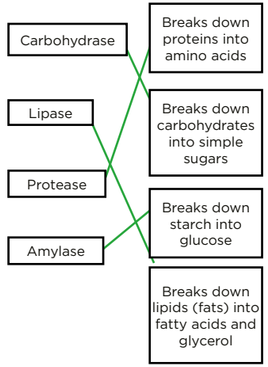
Fill in the blanks using the words below

We can test foods for protein using the biuret test. If protein is present it turns purple . To test for starch we add iodine solution and if starch is present it turns black. To test for sugar we add benedicts solution and put it in a water bath. If it contains sugar it will turn orange.

Orange protein sugar
starch biuret iodine
black purple water
benedicts

Enzymes

Match the enzyme to the function



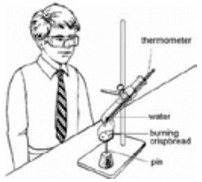
Explain the two terms and suggest how they can be prevented

Obesity
Eating too much and not using the same amount of energy consumed. Gaining weight which could lead to heart disease, high blood pressure and diabetes. Increase exercise or cut down food intake.

Malnutrition
Eating too little or not enough of each of the food groups. Causes deficiency diseases such as rickets.

Need to eat a balanced diet all food groups in moderation.

Complete the method for calculating the energy given from food



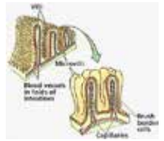
1. Set up the equipment as shown (tongs instead of pin)
2. Record the temperature of the water BEFORE
3. Set the crisp alight using the Bunsen, hold with tongs underneath the water.
4. Record the temperature of the water AFTER
5. Repeat for 2nd crisp

Absorption of food products

Describe what happens when food has been digested in the small intestine.

Food is digested into smaller molecules by enzymes. The small molecules e.g. glucose are absorbed into the blood stream across the villi.

The villi are highly folded to increase surface area for maximum absorption. The blood capillaries line the folds of the villi so that glucose can be transported straight into the blood stream from inside the small intestine.



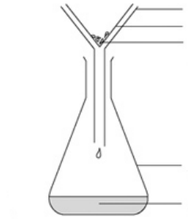
8C2 Compounds and Mixtures - Essential Knowledge Sheet

What type of separation technique is below?

Filtration

Label the diagram below with the key terms:

Filter Funnel, Filtrate, Residue, Conical Flask, Filter Paper

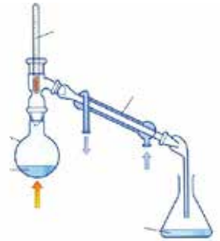


What type of separation technique is below?

Distillation

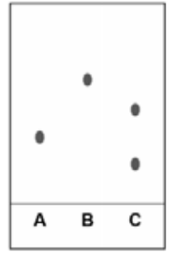
Describe what happens to the water during the separation technique.

The water is evaporated and then condensed



What type of separation technique is the diagram to the right?

Chromatography



How can you tell that A and B are pure? There is only 1 spot

How many colours make up C? Are any of the colours A or B?
2 colours make up C and none of those spots are A or B.

Describe how you would carry out this separation technique.

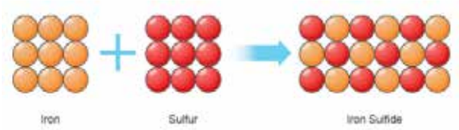
Using a pencil draw a line on the paper. Add small spots of colour on to the pencil line. Place the paper in water in a beaker. Allow the water to reach the top of the paper and the colours will have risen up the paper.

Define the following key terms.

Atom – a small particle that makes up everything
Element – made from 1 type of atom
Compound – made from 2 or more types of atoms joined together in a fixed proportion
Mixture – 2 or more substances not joined together
Soluble – dissolves in a solvent (e.g. water)
Insoluble – does not dissolve in a solvent

How would you separate the following mixtures?

Sand and Water: Filtration
Salt from salt water: Crystallisation/Evaporation
Different coloured inks: Chromatography
Water from salt water: Distillation
Iron from a mixture: Using a magnet of iron and sulfur



How can you tell that iron and sulfur are elements from the diagram?
They are made from 1 type of atom

How can you tell that iron sulfide is a compound from the diagram?
2 different types of atoms are joined together in a fixed proportion

8P1— Heat Transfer - Essential Knowledge Sheet

Another word for heat energy is Thermal Energy.

If you heat something up , you transfer this energy. The energy will be transferred from the hotter thing to the cooler thing.

How much thermal energy something has depends on two things:

1. Its temperature

2. Its size

Evaporation is when the particles. In a liquid. escape to form a gas. The particles that escape have more energy than the particles that are left.

Words: Particles, gas, energy, Liquid

The increased movement of the particles within the substance when something is heated means that:

•when substances are heated they expand (get bigger)

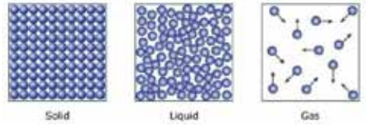
•when substances are cooled they contract (get smaller)

BEWARE! The particles themselves do not change size—the change in size of the substance is only because of the increased movement of the particles.

Convection
Convection is the way that heat energy is transferred through a fluid (any liquid or gas).

Convection currents happen because hot fluids rise, and cooler fluids sink to take their place. This happens because materials expand when heated so their density becomes less.

Draw how the particles are arranged:



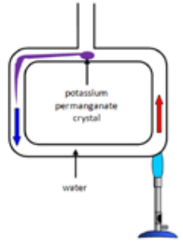
Match up the definitions

Conduction	Happens in fluids when energy is transferred by moving particles.
Convection	Also known as infrared. This type of heat transfer doesn't need particles.
Radiation	Happens in solids when particles vibrate more and pass on their energy by colliding.

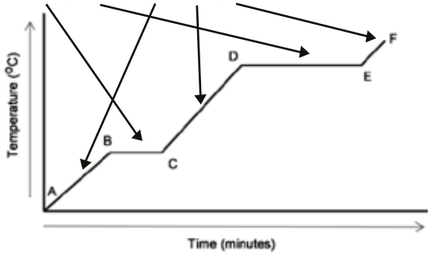
The temperature of something tells us exactly how hot or cold something is.

We measure it using a piece of equipment called a thermometer

The unit that we use to measure it is Degrees Celsius (°C)



Label the heating curve of water with the following:
Melting, Boiling, solid, liquid, gas



¿Qué haces con tu móvil?	What do you do with your mobile?
Chateo con mis amigos.	I chat with my friends.
Comparto mis videos favoritos.	I share my favourite videos.
Descargo melodiás o aplicaciones.	I download ringtones or apps.
Hablo por Skype.	I talk on Skype
Juego.	I play.
Leo mis SMS.	I read my texts.
Mando SMS.	I send texts.
Saco fotos.	I take photos.
Veo videos o peliculas.	I watch videos or films

Gramática

You use the present tense to talk about what usually happens.

These are three groups of vegular verbs:

Forming the present tense:

Step 1:
Take off the infinitive ending.

Step 2:
Add the relevant present tense ending.

-ar verbs		-er verbs		-ir verbs	
habl**ar**	to talk	le**er**	to read	compart**ir**	to share
habl**o**	I talk	le**o**	I read	compart**o**	I share
habl**as**	you talk	le**es**	you read	compart**es**	you share
habl**a**	he/she talks	le**e**	he/she reads	compart**e**	he/she shares
habl**amos**	we talk	le**emos**	we read	compartim**os**	we share
habl**áis**	you (pl.) talk	le**éis**	you (pl.) read	compart**ís**	you (pl.) share
habl**an**	they talk	le**en**	they read	compart**en**	they share

¿Con qué frecuencia?	How often?
todos los días	every day
dos o tres veces a la semana	two of three times a week
a veces	sometimes
de vez en cuando	from time to time
nunca	never

¿Qué tipo de musica te gusta?	What type of music do you like?
el rap	rap
el R 'n' B	R 'n' B
el rock	rock
la música clásica	classical music
la música electónica	electronic music
la música pop	pop music
¿Qué tipo de musica escuchas?	What type of music do you listen to?
Escucho rap.	I listen to rap
Escucho la música de...	I listen to ...'s music.
Escucho de todo	I listen to everything.

Palabras muy frecuentes	High-frequency words
así que	so (that)
mas... que...	more... than...
mi/mis	my
su/sus	his/her
normalmente	normally
no	no/not
nunca	never
o	or
porque	because
también	also, too
y	and

Making everything match up

When you use the he/she/it form, you often need to change other elements of the sentence:

me gusta (I like) →
le gusta (he/she likes)

mi programa favorito
(my favourite programme) →
su programa favorito
(his/her favourite programme)

mis amigos (my friends) →
sus amigos (his/her friends)

Giving options

- **Use a range of opinion-giving phrases to make your sentences more interesting**

❤❤❤ Me encanta...
✖✖ No me gusta nada...

- **Give a reason: porque es guay/triste/horrible...**

porque me gusta el ritmo...

- **Make an exclamation: ¡Qué va! ¿Estás loco/a?**