Research Cards Year 8

Research cards can be laminated and used for individual pieces of research.

It is not necessary to follow through the pages in order.

This means that in a class of 30, a few sets can be prepared and shared around.

Students can work together in pairs.

Research topics

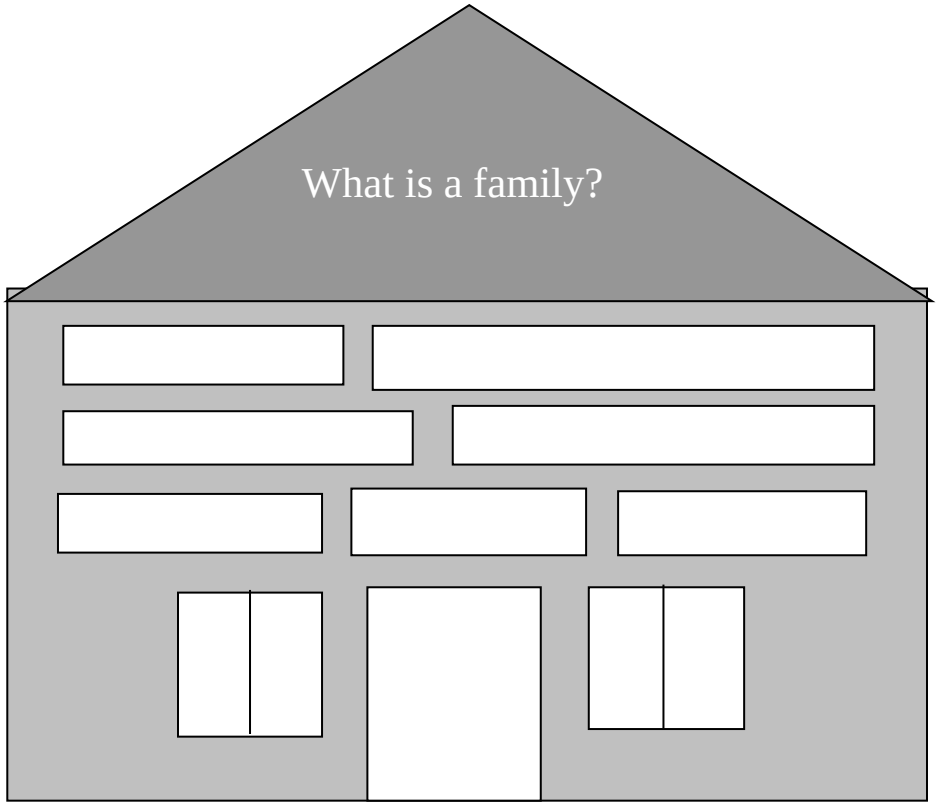
God is Love: The Family
God is Provider: Animal farming; Cotton
God is Pure-Holy: The human body; heredity
God is Creator: Creation; Space
God is Wise: sea voyages
God is Protector: Smoking, drugs & alcohol
God is Truth: Leadership

The Family 1

God places us in families

Draw the shape of a house. Draw bricks inside of various lengths. In the roof of the house, write: *What is a family.* Inside the bricks on the walls of the house, write all the things that a family could provide. *Examples:*

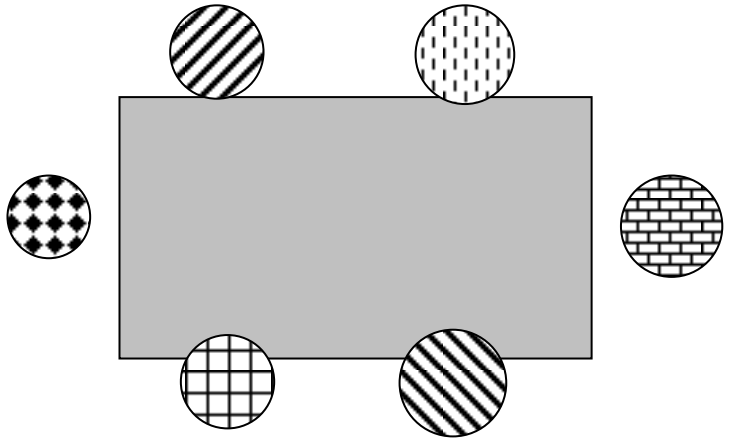
- shelter from storms and heat
- protection from evil
- love
- good memories
- friendship to others
- fun
- good food
- knowing God's ways



The Family 2

My family table

On a sheet of paper draw a picture of your family table. Choose a colour for each family member. Your drawing could look something like this:



Colour can remind us of feelings. Yellow may make you feel happy. Red may be for someone who is loud most of the time. Pink may be for kindness. Blue may be for a calm feeling. Green may be for someone who is neat and tidy. Write a sentence for each family member. Write their name and explain why you chose that colour.

EXAMPLE
Mum =
Sister 1 =
Dad =
Sister 2 =
Brother =

The Family 3

God planned for us to live in families

1. Why has God planned that we live in a family?

a) Take a sheet of paper and write a sentence about each of these. Think about who provides these things.

- food
- shelter
- love
- care
- protection
- happiness

b) Which of those things provide for the needs of our body?

c) Which things are special to the way we feel?

2. Here are some different types of families:

- old
- young
- families with one parent
- families with one child
- families with many children

a) Which type of family do you live in?

b) Choose one type of family to draw. Write a sentence under your drawing explaining how this type of family is different from your own.

3. Getting on together

a) Write a sentence about why it is important to get on well with the members of your family.

- Think about all the things you do together
- Think about the amount of time you spend together

The Family 4

Respect

Here are some important things that every family should have.

Respect means treating people as if they are important. It means taking notice of the things they say. Another word for *respect* is *honour*. *Respect* is listening to what God has to say about the way family members treat one another. God has written some rules for families. Here they are:

- Honour you father and your mother. (Exodus 20)

This is one of the 10 commandments. It means that children must listen to what their parents tell them, and obey cheerfully. It also means to be helpful to our parents.

- Children, obey your parents, for this is right.
- Sons, listen to your father's instructions. (Proverbs)
- Be faithful to your husband or wife.

This one is for parents. It is also one of the 10 commandments.

- Love one another. 1 John 7:9

This one is for everyone!

a) Why is it important for children to respect their parents?

c) Why do you think it is important for children to obey their parents?

d) Why do parents sometimes have to discipline their children?

e) Do parents still love us when they discipline them?

f) What are some things our parents do to help us obey?

The Family 5

Loyalty

Loyalty means 'not choosing the opposite side'. Another word for *loyalty* is *faithfulness.* Faithfulness is one of the fruits of the Spirit.

a) When did you stick up for someone in your family?
b) Would you have changed sides if everyone else had been on the opposite side?
c) Find out about two people in the Bible who were not loyal to Jesus. Write a sentence about each:

- Matthew 26:14-16

- John 18:25-27

d) The Bible says in Malachi 3:6 "*I, the Lord change not."* Does God still love us when we do wrong? Will God *always* care for us?

e) How do parents show faithfulness to their children?
f) How can children be faithful to their parents?
g) How can you be faithful to your brothers or sisters?

The Family 6

Trust

We can *trust* someone who is faithful. We trust them because we know them very well. We have usually known them for a long time. When we trust someone, we feel sure that they will be good to us. We feel sure that they won't do anything bad to us.

a) Why can children trust their parents?

b) Why can we trust God?

c) Write a list of all the people you trust.

d) Name a baby animal that trusts its mother.

e) How can we make an animal trust a human?

f) What would cause an animal to distrust a human?

g) Draw a picture of an animal that shows trust towards a human.

The Family 7

Love

a) How do you show love to members of your family?

b) How do they show love to you?

c) Fill the gap, from Proverbs 18:24. There is a friend who sticks closer than a _____. Who is this friend?

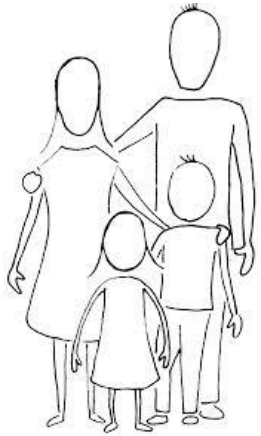
d) The love we have for the members of our family is very special. Why is it different to the love you may have for a friend?

e) Roman 12:9-10 tells us about brotherly love. What is special about brotherly love?

f) What is the greatest love that can ever been shown? John 15:13.

g) How does Jesus want us to love? John 13:34.

h) Fill the gap, from 1 John 4:20-21 - If we hate our brother we cannot say that we _____.



The Family 8

Forgiveness

Family members often have quarrels. This doesn't mean that they don't love one another. When we know someone very well, we sometimes say the things we are really feeling. Maybe these things upset family members. When we are at home, we sometimes forget to be as kind, or as polite as when we are at another person's house.

If we do not forgive one another, then the quarrel can go on for a long time. Sometimes people don't talk to one another. Sometimes people continue being angry with one another.

a) What should we do when we have a quarrel with a family member?

b) How soon should we forgive each other?

c) What would you do if you wanted to say sorry, but the other person was still angry with you?

d) There is a story in the Bible where there was trouble between brothers - one was Jacob and Esau. The story had a happy ending. Why?

e) Read about a Father who forgave his son in Luke 15:11-32. What does this story tell us about God our Heavenly Father?

The Family 9

Support

A table has support. Its legs are its support. The table top cannot stay up by itself. It needs the legs to help. It's a bit like that with families. Families need to work together and stay together to help one another.

a) Choose someone in your family. How can you be a support to that person?

b) Write a sentence about a time when you showed support to someone in your family.

c) Draw a picture of a family situation where the children are showing support to Mum or Dad. Here are some examples:

- *Mum is having visitors to tea and the washing machine has just over-flowed. How can the children help?*

- *Dad has to gather up the papers for recycling, and the garbage collection is due in 5 minutes. How can the children help?*

The Family 10

Cooperation

It is important for family members to cooperate with each other.

a) Write a sentence to explain what 'cooperate' means.

b) Draw a picture or cartoon strip to show how family members cooperate with each other. Here are some examples:

- *Dan has a difficult project and he can't understand all the instructions. How can Dad help?*

- *Susan can't do up her shoe laces but her older brother can. The family is late in getting ready for school*

c) Now write a list of family rules that would be important for cooperation in *your* family.. Examples:

- Children go to bed at 8.30 p.m.
- Children ask permission before watching T.V.
- All family members clean up after themselves.
- No one is to make unnecessary work for others.
- All family members speak and act kindly towards one another.

Make a work chart to show how you and your brothers or sisters cooperate with Mum and Dad to get things done. Put the date at the top of the chart. Each person can put a tick next to their name when they've done the job.

Family Work Chart		Week ending:
Name	**Job to be done**	**When?**
Ben	Putting the bin out	Tuesday

The Family 11
The fruit of the Spirit

There are nine fruits of the Spirit. Do you know them? So far we have looked at the fruits of love and faithfulness, but there are seven more. The fruits of the Spirit are very important for every family.

a) Look up Galatians 6:22-23. Write out these verses.

b) Think of ways of showing the fruits of the Spirit in your family. Example:

LOVE… hugging my Mum

JOY … ***making Mum a special present.***.

PEACE…not fighting with my little brother

PATIENCE…

KINDNESS…

GOODNESS…

GENTLENESS…

FAITHFULNESS…

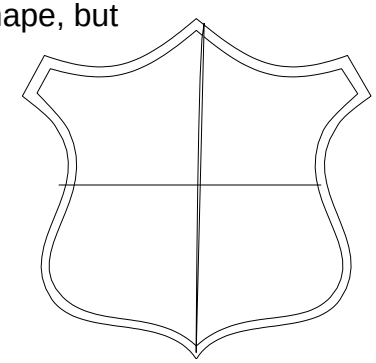
SELF-CONTROL…

Draw a picture of each member of your family. Write a describing word underneath each person. Include your pets too if you like. Use some of the fruits of the Spirit to describe them.

The Family 12
Taking a look at families

1. My family

a) Draw a picture of your family. Put them in order of size from the tallest to the smallest. Name each person.
b) List the approximate ages of the members of your family.
c) Write next to each name something that person is good at. Write something about their character that is special.
d) Make a family shield. Copy this shape, but larger. In each section draw something that is special to your family, e.g. pets, house, sports, music.



2. The family of God

a) What is the family of God?
b) How is it like a real family?

3. Looking at families

a) Sometimes we can tell that a family is a family simply by looking at them together. We are usually like one of our parents more than the other. Think about your family. Who is alike among your brothers and sisters? Who is like Mum? Who is like Dad?
c) Family members can also be alike because of the way they speak or act. Write some sentences about your family. Who acts more like Dad? Who acts more like Mum?
d) Draw two family members who look alike.

The Family 13

Heredity

Children look like their parents because of heredity. This means that similar traits are passed on from parent to child.

a) Write the meaning of heredity from your dictionary.
b) What kind of physical traits can be passed on?
c) What personality traits could be passed on?

Family likenesses are passed on by genes. Genes are in our cells and are very tiny. Twenty thousand genes laid end to end would not even measure a millimetre. There are different kinds of genes. Each kind controls a particular feature. For example, there are pairs of genes for hair colour and eye colour, for skin colour and for height. Genes are made up of a special chemical called DNA. Why is it special? Because it can copy itself! Genes are like a set of instructions for how we are made. We have two genes for everything. One is from Mum and one is from Dad. These genes make us look a bit like Mum and a bit like Dad.

The first person to discover the idea of genes, was an Austrian monk called Gregor Mendel, back in the 19th century. He worked with pea plants. He studied the way the shape of peas, and the colour of the flowers, was passed on to the next generation. He worked out that there must be two copies of each gene in the pea. In each pair of genes, one is stronger than the other. We call the stronger gene the **dominant** gene.

Hair Colour

For hair colour, black is dominant over blonde hair.
What hair colour do these genes make?

a) black and black
b) black and blonde
c) red and red

The Family 14

God created us to be like Him

God is our Heavenly Father, and we are His children. He has given to us aspects of his character.

a) Write out the Bible verse, Genesis 1:27.
b) God created us to be like Him in these ways:
   loving ***kind*** ***forgiving***
   Can you think of some others?
c) Not everyone lives as God wants them to live. This means that not everyone shows the character of God in their lives. Think of ways in which we can show more of the character of God in their lives.
d) God is the perfect father. Not all fathers are perfect, but here are some similarities between human fathers and our Heavenly Father:

- Provider
- Protector
- Creator
- Someone who disciplines
- Someone who loves
- Someone who is in charge
- Someone who forgives

Explain how God is the perfect Father.
God is the perfect Father because He …..

The Family 15

Adoption

Adoption means *taking up and treating as one's own*.

Some families adopt children. This means that a child from another family comes to live with a new family. Often the adopted children are babies when they come to live with the new family. Adoption may happen for a number of reasons. Perhaps the child's parents have died. Perhaps the parents can not look after the child for some reason.
Sometimes children from other countries are adopted because of poor conditions in that country. Sometimes people who have plenty, in countries like ours, give money to support children in poorer countries. They have a *foster* child. The child doesn't come to live with that family, but instead, money is sent each month to provide food and clothing for the child, who continues to live with his or her own family.

In the Old Testament we are told about a baby who was adopted by an Egyptian princess. His name was Moses.

1. Why did God allow this baby to be adopted? (Think about how God used Moses to help God's people.)

Did you know… that God adopted us?
Because of Adam and Eve's sin, humans are separated from God. However, because of Jesus' death on the cross He made it possible for all of us to become His children.

2. Write out these verses: John 1: 11 and 12
3. Read Romans 8:14 and 2 Corinthians 6:17-18. Who are the sons of God?
4. Read Galatians 3:23-26.How are we made children of God?

The Family 16

Family trees

We can divide family members into two groups:
immediate and extended

1. Make a list of your Immediate family
Your Dad, Mum, sisters and brothers

2. Make a list of your extended family
Your grandparents, aunties, uncles and cousins

3. Family trees in the Bible
In the Bible we can learn about family trees from the *genealogies.* Find out what these are.
Here are the first three generations of the family of Jesus, starting from Abraham. (A generation is the distance in time between parents and children.)
a) Abraham's son was Isaac
b) Isaac's sons were Jacob and Esau…
c) Find out which son - Jacob or Esau - carried on the family tree.

Abraham was a very important person because God chose Him to be the father of many generations. God planned that Jesus would come from Abraham's family.
d) What was the promise given to Abraham? (Genesis 12:2)
e) What was the promise given to Sarah? (Genesis 17:15-16)
f) What did Abraham have to do to inherit the promise? (Genesis 12:1)
g) What was the great nation that came from Abraham?

4. Draw your family tree

Animal Farming 1
Dairy Farming

Very early in the morning the cows are driven to the milking shed. Cleanliness is essential in the handling of milk. The farm workers scrub their hands before they begin and the cow's udders are washed. All equipment has to be sterilized.

Cows were once milked by hand, but now electric milking machines are used. Electrically operated suction caps are fitted to the teats of the cow. As these expand and contract they extract the milk from the udders. The milk flows along a tube into the can. In the tube there is a section made of glass through which the farmer can watch the flow of milk and see when the cow has been milked dry. These machines are thoroughly cleaned and sterilized after each milking.

When all the cows have been milked they are herded back to the pasture where they eat grass and chew their cud all day. In the evening they are taken to the shed to be milked again.

While the milk is still warm it is strained and put through a cooler, ready to be picked up by a refrigerated milk truck that takes the milk to be processed.

As soon as the milk arrives at the processing plant it is pasteurized, which means it is heard to a temperature of 75 degrees Celsius in 15 seconds, and immediately cooled down to freezing point within 25 seconds. This ensures that the milk is free of bacteria. By-products of milk are butter, cream and yoghurt.

1. Describe the dairy farmer's job.
2. What happens to the milk after it leaves the farm?

Animal Farming 2
Meat production

In the beginning God created wild animals and domestic animals. Domestic animals can be farmed and are very useful to us. In earlier times animals were hunted for food, and in some cultures, this is still done.

For those of us who buy meat at the shops, there are different kinds of meat available:
Beef, from cattle
Veal, from calves
Lamb
Pork from pigs
Venison from deer

Farmers who raise animals for meat start by buying female animals which give birth to young. The farmer cares for the herd, ensuring that the animals always have plenty of feed and water, until such a time when the animals are old enough to be sold for meat.

The animals are loaded on to trucks and taken to the abattoir. Here every precaution is taken to ensure that the meat is handled hygienically. The meat is graded and sent to the butcher's shops or supermarkets. Butchers know how to cut the meat into various "cuts" such as chops, steaks and roasts.

1. Describe the job of a beef or sheep farmer who raises animals for their meat.
2. What is the job of the butcher?

Animal Farming 3
Egg and poultry production

Poultry is the word used to describe the meat from:

a) Roosters, hens and chickens (also called fowls)
b) Drakes, ducks and ducklings
c) Turkey cocks, turkey hens and chicks

A poultry farmer keeps poultry for either eggs or meat.

Fowls are kept in fowl runs. They should have ample space to walk around and scratch for food such as insects and greens. Hens that have space to do this are called “free range” and are much healthier and happier than hens that are confined to farm sheds or cages. Hens are raised in cages are given only pellets to eat and never see the light of day. Many animal activists are against this type of farming.

With both types of farming, nests are lined with straw, and the hens are fed pellets or wheat. A farmer that raises hens in a natural setting will have a rooster, and only one. If there is more than one, the roosters will fight. When a hen becomes “broody” she will want to sit on her eggs and be left in peace, waiting for her chicks to hatch.

Some chicks are hatched using incubators. The small chicks are put into a shed and have to be cared for by the farmer as they have no mother hen to look after them.

1. What is a “free range” hen?
2. What are the advantages of “free range”?
3. Why do you think some farmers choose to raise hens in cages?

Animal Farming 4
Wool production

Sheep are raised for many purposes. The most important reason farmers raise sheep is for their wool. This thick fibre coat is shaved off, or shorn, every year. It is used to make clothing, blankets, and other materials. Sheep can stay warm even on cold winter days thanks to their warm wool coat!

Sheering sheep is similar to cutting hair. Sheering is usually done in Spring. If sheep are not shorn they can suffer from over-heating in the hot summer months.

The fleece is sent to the woollen mills for processing. It is tangled and matted. In order to spin the wool into yarn, the fibres need to be running parallel to each other. This is done by carding, which is similar to combing. It is done by special machines. Once the wool is carded, it can be spun into yarn by twisting the fibres together.

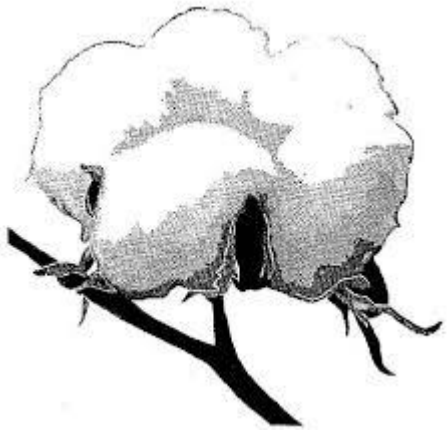
Female sheep are called ewes, and males are called rams. Rams more often have horns, although there are some rams that are without horns, and there are some females that have horns!

A sheep farmer has to make sure the sheep have plenty of grass to eat and water to drink. They also should provide shelter from the hot sun, by planting trees in the paddocks.

1. When would a sheep farmer have to employ extra labour?
2. Why is sheering necessary?
3. How is the fleece processed to make woollen yarn?
4. What are the advantages of woollen clothing?

Cotton 1
The history of cotton

Most people in Europe learned to make clothes from wool, but as the British Empire expanded to India, it was discovered that cotton grew there, and the Indian people made their clothes from cotton. Travelers who first visited India came home and told their people about “the little lambs that grew on the bushes”. They brought with them pieces of material made from these little lambs. They described these bushes to their people: the flowers on the bushes turned into pods covered with soft fluffy wool, which could be picked, spun into threads and woven into cloth. Some of these pieces of cloth were so fine that they were called “webs of woven wind”.



Explain how cotton first started to be used for clothing in Europe.

Cotton 2
The cotton plant

- Cotton grows only where the sun is very warm and there is regular rainfall. (There must be at least 200 days without frost after the seeds have been sown.)
- The plant grows from 1 to 3 metres high and has flowers. These are pure white at first; later they turn to a delicate pnks; finally they become a deep red.
- Inside the flower a round seed pod is formed. This is called a cotton boll and it is green.

- When the boll ripens it turns a dark brown. It bursts open to show a bunch of white downy fibre covering the seeds (about the size of a tennis ball).
- The cotton is a fluffy mass of hair-like fibres. On some plants these fibres are longer and finer than on others. Each single fibre is flat and twisted and it is because of this twist that the long fine thread can be spun.
- Fabric woven from cotton is cooler than silk or wool so better for clothing in hot countries.

1. What are the conditions for growth?
2. Describe the plant with flowers
3. What is a cotton boll?
4. The boll contains white fluffy fibre. What else does if contain?
5. Why is the twist important?
6. What are the advantages of cotton fabric?

Cotton 3
The story of cotton

Make a summary of the following:

In the early days, cotton was carried in the ships of Arab traders and on the backs of camels to many countries around the world.
But when Columbus discovered America in 1492 he found the cotton plant growing there. This was probably one of the factors which convinced him that he had found the sea route to India.

The Indians gave him skeins of cotton in exchange for beads. He also took branches of the cotton plant home with him to Spain and gave them to King Ferdinand and Queen Isabella. Later, Cortez, the conqueror of Mexico, found the Mexican Indians dressed in brightly coloured cotton garments.

The Europeans who came to live in America began to grow cotton. Cotton grew easily in the South of the USA where it was warm. The biggest difficulty was to get the seeds out of the fibres. The bolls had to be torn apart and the seeds extracted with the fingers. This was difficult because the fluffy fibre clung tightly to each seed.

Then a young man named Eli Whitney moved from the North of the USA to the South, to take up a job as a teacher. He was interested in cotton and gave much thought to the problem of separating the seeds. Eventually he invented a machine called a cotton gin (1792). This was a box-like machine with rows of metals teeth and a handle. There was a hole at the bottm through which the seeds dropped. It was so successful that soon all the cotton farmers were made their own gins. This meant that large quantities of cotton could be cleaned in a short time. Soon the USA was the largest cotton producer in the world. Farmers became rich largely due to free labour through the slave trade. A Christian man, William Wilberforce battled to have the slave trade abolished, and it was finally abolished in 1808.

Cotton 4
Cotton countries of today

Major cotton producing countries in 2014/15

China: 33.0 million bales.

India: 27.0 million bales.

United States: 18.0 million bales.

Pakistan: 10.3 million bales.

Brazil: 9.3 million bales.

Uzbekistan: 4.6 million bales.

Australia: 1.9 million bales.

Turkey: 2.8 million bales.

Egypt: 1.5 million bales

Quality of cotton

Some of the finest cotton comes from Egypt. The flooding of the Nile Valley ensures well-cultivated soil, but the fields must be irrigated. The long fibres are easily handled and are woven into superior quality cotton cloth.

Good quality cotton of medium length fibres in grown in the valley the Mississippi River, USA

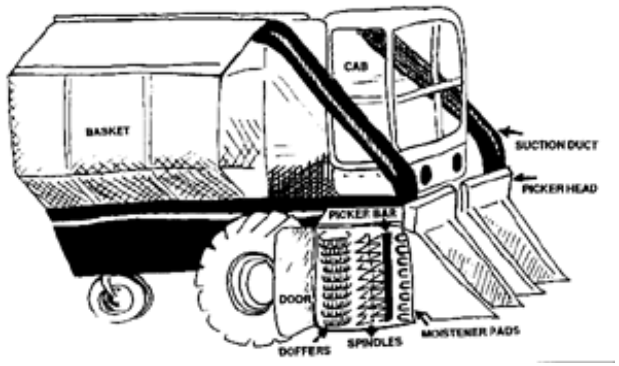
In India the plants are crowded together. The soil is poor and therefore the fibre is of low grade.

1. How much more cotton is produced in China than the USA?
2. Which country is the second biggest producer?
3. Name a country that borders Uzbekistan.

Cotton 5
Growing cotton

- The finest seeds are kept for planting.
- The cotton sees are planted close together and the weak plants are thinned out.
- The soil around the plants is hoed and weeded.
- It takes 6 or 7 months of favourable weather for the plant to produce ripe cotton bolls.
- At one time all crops were picked by hand. Machines are used today for about 30% of the world's cotton production. Australia, Israel and the USA are the only countries where all cotton is picked by machines. Machine picking is increasing in Argentina and Brazil.

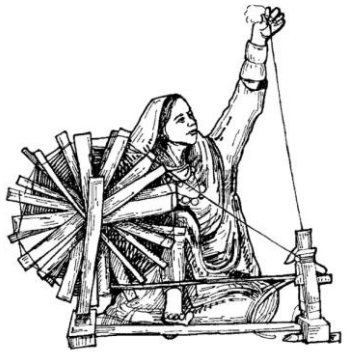
Write a description of your work, as if you were a worker on a cotton plantation.
How would you harvest the cotton on a plantation in India?
Draw two pictures: one showing harvesting by machine, the other showing harvesting by hand.



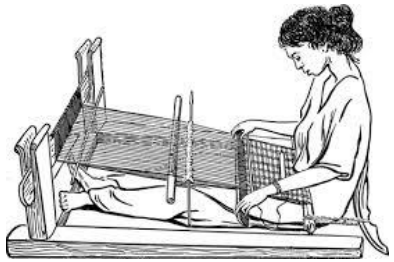
Cotton 6
Cotton from farm to factory

1. The cotton is picked. This must be done as soon as the ripe boll bursts open, before the seeds are scattered by the wind.
2. The seeds are removed in the gin houses.
3. The cotton is pressed into bales (about 125 kg per bale)
4. The cotton is taken to the ports. Today cotton is transported by truck, but in earlier days cotton was transported using wagons pulled by mules or oxen, or in the case of Egypt, on the back of camels.
5. The cotton is shipped to factories
6. In the factories the cotton is made into long fibres, put on to a spindle and woven into cloth with a loom.

Draw a labeled diagram of how cotton travels from the plantation to factories.



spindle



loom

Cotton 7
Making cotton cloth

1. When the cotton bale arrives at the mill it is a mass of kinky, tangled fibres, full of dirt and dried twigs and leaves. The bales are opened and the cotton put into a machine which blows the cotton apart, leaving the dirt behind.
2. The fibres are then pressing into a loose fluffy blanket. This blanket is carded and combed. Carding is a process of separating individual fibres, and placing so that they lie parallel to one another while also removing most of the remaining impurities. Combing gets rid of any fibres that are too short to use.
3. The fibres are twisted together and stretched. Then they are wound on to spindles.
4. The fibres are woven on looms.
5. The fabric is dyed.

Put these in the right order:

- Fibres are pressed into a fluffly loose blanket
- Fibres are untangled and dirt remover
- Fibres are woven together
- Fibres are carded and combed
- Fibres are dyed
- Fibres are woven on looms

Cotton 8
Uses of cotton

- Clothing
- Furnishing fabric, e.g. cushions
- Sheets and towels
- Belts for machinery, e.g. conveyer belts
- Tents, tarpaulins
- Bags and sacks of all description
- Aeroplane runways
- Motor car tyres
- Stuffing mattresses
- Oil from the seeds is used for cooking oil
- Oil is used for making candles and soap

Why do you think cotton is better for belts on machinery than leather?

Make a poster
List and draw all are the uses for cotton in the home.
List and draw all the uses for cotton in industry.

The Human Body 1
The circulatory system

The heart is a muscle – the most important muscle in your body! It is divided into four pockets. The heart is a pump that circulates blood through the body at a rate of five litres per minute. Arteries are blood vessels that carry blood away from the heart. They carry oxygen to all the parts of the body. The oxygen makes arteries look red. Veins are blood vessels that carry blood from the body parts back to the heart. The blood in veins has no oxygen, so veins look blue. The heart pumps blood to the lungs where it can pick up oxygen again, and then it goes around the body again, in a continuous cycle.

The heart pumps by contracting and relaxing. Each time the heart contracts it forces blood through the arteries. This is what causes the heartbeat and the pulse rate. You can feel your pulse on your neck or your wrist. The normal pulse rate is between 70 and 80 beats per minute. However after exercise your pulse rate will be much higher.

Heart health
It is good to get your heart pumping rapidly when you exercise. Exercise is good for a healthy heart and healthy arteries. Exercise that causes our heart to pump rapidly is called *cardiovascular* exercise. It makes you huff and puff.

Here are some good things to do regularly for cardiovascular exercise:
running, skipping, swimming, fast walking, aerobics

1. What is the most important job of the heart?
2. What can you do to maintain good heart health?

The Human Body 2
Circulatory system: Food for a healthy heart

We can maintain a healthy heart by eating the right foods. If we become overweight we can put too much strain on the heart. To maintain a healthy weight we need to do regular exercise and eat the foods that are as close to nature as possible. Foods that cause us to put on weight are the processed foods like fast foods and junk foods, white bread and sugar.

There are good fats and bad fats. Eating the bad fats like margarine and the fats in fast food, like chips, burgers and pastries will not be good for our arteries. They can cause the arteries to become narrow, due to a gradual build-up of a substance called plaque, and then the blood cannot flow through properly. If the arteries around the heart get blocked, it can cause a heart attack.

This can happen to older people. It takes many years for the plaque to build up. However, we should look after our heart even when we are young, and form good habits, so that when we are older we have less health problems. We need to eat the good fats like the fats in nuts, butter, eggs, fish, and coconuts. We should avoid the bad fats. We should also eat less of the foods made with white flour and sugar. These foods put on weight.

1. How can being overweight cause heart problems?
2. Which foods would not be good for the heart?
3. Which foods would be good for the heart?

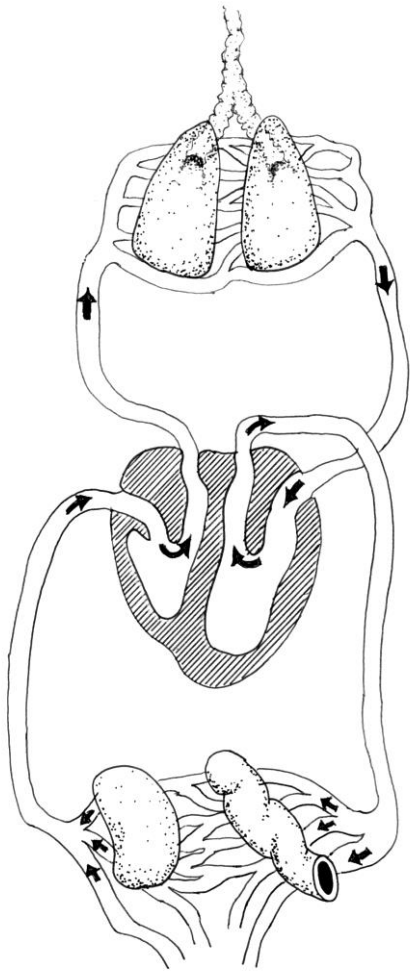
The Human Body 3

Circulatory system: The heart

Draw this picture of the heart and the blood vessels. Follow the arrows, using your finger, to trace the flow of the blood around the body.

Colour the blood vessels on the left, in blue. This is the blood that does not carry oxygen. It comes from the cells of the body, where all the oxygen has been used up. This blood is on its way to the lungs where it will receive oxygen again.

Colour the blood vessels on the right, in red. This is blood that has received oxygen form the lungs. It is taking the oxygen around the body, to the cells.



The Human Body 4

Circulatory system: Functions of the blood

Blood consists of a watery liquid called plasma, with red and white blood cells and platelets.

Red blood cells carry oxygen to all parts of the body.
White blood cells fight infection and protect the body against disease.

Plasma is the liquid part that carries nutrients around the body.
Platelets make blood clot if you cut yourself.

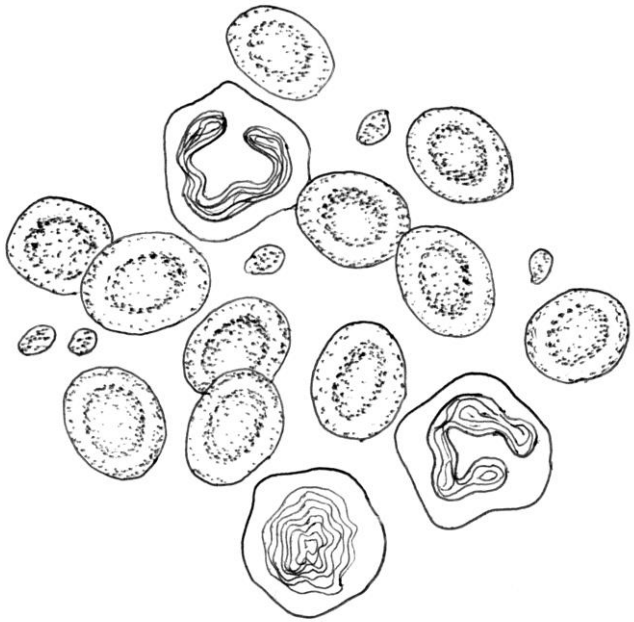
There are many more red blood cells than white blood cells. The blood is a transport system. It transports oxygen and nutrients to the body cells so that the body can live and have energy. It carries the waste products back for filtering out through the kidneys and liver. It takes water to our cells, keeps us at the right temperature, and protects the body against infection. Blood also protects us because it has the ability to clot after an injury. This stops us from bleeding to death!

1. What is blood made of?

2. What are the functions of the blood?

The Human Body 5
Circulatory system: The blood under the microscope

Draw this picture of blood cells. Label the red blood cells, white blood cells and blood plasma.



Clues:
Red blood cells – doughnut shaped and plentiful
White blood cells – irregular shaped, bigger and fewer
Plasma – the fluid containing the blood cells

The Human Body 6
Circulatory system: Facts about blood

Blood is made up of four parts – plasma, red cells, white cells and platelets. Each part has a special job.

- Plasma is a yellow liquid. It helps give you energy and grow.
- Red blood cells carry oxygen to your cells.
- White blood cells clean the blood and fight germs. When a virus enters your body, white blood cells rush to destroy the virus so you get better.
- Platelets help your blood clot. When you cut yourself, a clot forms so the blood stops running. If your blood didn't clot, you could bleed to death.

Copy:

1. White blood cells clean the blood and fight _____. When a _____enters your body, white blood cells rush to destroy the virus so you get better.
2. Blood carries oxygen and nutrients to all the _____in your body so they can grow and stay healthy.
3. Blood is made up of four parts –_____, red cells, white cells and _____. Each part has a special job.
4. Red blood cells carry _____to your cells.
5. Plasma is a yellow _____. It helps give you energy and grow.
6. Platelets help your _____clot. When you cut yourself, a clot forms so the blood stops running. If your blood didn't clot, you could bleed to _____.

The Human Body 7
The immune system

The immune system is a system of defence. As well as blood vessels, (arteries and veins), we have other vessels throughout our body. These are lymphatic vessels, which carry clear, slightly yellowish blood plasma called lymph. This circulating body fluid helps defend the body against disease-causing agents. Lymph carries special cells that will attack invaders. Some will eat (ingest) bacteria. Others will fight viruses and any unusual cells like cancer cells. Some cells, called natural killer cells, have little spears that make holes in the enemy cell, making little channels. Surrounding fluid flows into the enemy cell so that it fills up and bursts. This reminds us of how God fights for us, just like the armour of God in Ephesians 6.

The skin is also part of the immune system. It keeps out bacteria. However it does not keep out all chemicals. The skin has pores through which waste product are eliminated as sweat. Substances can also be absorbed through our skin into the bloodstream, so we have to be careful about what we put on our skin. We should never touch toxic chemicals.

1. **What is the immune system?**
2. **What does it do for us?**

The Human Body 8
How to build a healthy immune system

A person's immune system can be strong or weak. A person with a strong immune system is a healthy person who does not get sick very often. They don't catch many colds and flu because their defence system is working hard to keep out the invaders. If they do happen to catch a cold, or a contagious illness, this person will recover very quickly and return to good health. A person with a weak immune system will be the opposite – often sick, and their recovery time is slow.

We can make our immune system stronger by eating healthy food. Sugar is one of the worst foods for making our immune system weak. This is because it's hard for the body to break sugar down into small units. Raw fruits and vegetables are the best foods for building a strong immune system.

We can build a healthy immune system so that we can resist the effects of germs, by following the rules for healthy living:

- **N**utrition – eat healthy food
- **E**xercise – at least half an hour every day
- **W**ater – 6 glasses a day, (not fruit juice or fizzy drink)
- **S**unlight – for vitamin D. Keep sun exposure to 10 minutes at a time, in the cooler parts of the day
- **T**oxin-free – avoid food additives and avoid toxic chemicals in the environment
- **A**ir – get fresh air every day
- **R**est – don't stay up late
- **T**hink happy thoughts and trust in God

1. Which two words can you make using the first letter of every rule?
2. Write the eight rules for healthy living and draw a symbol for each rule.

The Human Body 9
The skeletal and the muscular systems

These two systems are connected because the muscular system holds the skeletal system in place. There are 400 muscles supporting the spine.

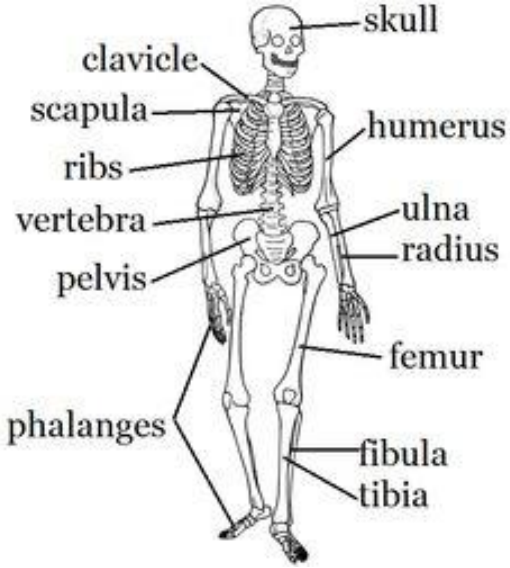
The skeleton is made of bones, which are the hardest material in the human body. Yet our bones are living tissue in which red and white blood cells are made, and also a storage site for calcium. Bones have the ability to grow and repair themselves if they are fractured or broken. Although bone is the hardest tissue in the body, it contains nearly 50% water.

There are two parts to the skeletal system:
1. The axial skeleton consists of the skull, the spine and the rib cage. This part of the skeleton protects the brain, the heart and the lungs.
2. The appendicular skeleton consists of the bones of the arms, shoulders, legs and hips. This part of the skeleton has joints, which allow us to move, and do activities.

The spine is a very important part of the skeletal system because it is also part of the nervous system, which sends messages to the brain. The spine is made up of 26 bones called vertebrae. If the spine is broken, the nerves can no longer send messages to the brain, so a person may become paralyzed.

1. What are the two parts of the skeletal system?
2. Which important organs are protected by the skeletal system?
3. What happens to a bone if it is broken?
4. What happens if the spine is broken?

The Human Body 10
The skeletal system



1. Draw a human skeleton and label the bones.
2. Now draw a table and match the common names on the left with the technical names on the right. (They are mixed up.)

Thigh bone	Scapula
Back bones	Humerus
Collar bone	Tibia
Shoulder blade	Femur
Hip bone	Vertebra
Shin bone (lower leg)	Clavilce
Upper arm bone	Pelvis
Lower arm bone (inner)	Ulna
Toes	Radius
Lower arm bone (outer)	Phalanges

The Human Body 11

Bone health

To build strong and healthy bones we need to do two things:

1. eat nutritious food
2. exercise

The bones are storage places for calcium. Bones are made from calcium. When the body needs calcium, it can get it from the bones. The bones will send calcium into the blood and the blood takes it around the body as needed. So we need to eat foods that give us calcium. Although milk contains lots of calcium, that form of calcium is not the best form of calcium to build bones. We also need foods like fruits and vegetables – especially green ones – to help the body absorb the calcium.

To build bones we need to do exercise called *weight-bearing* exercise. This type of exercise makes the muscles work hard, but the heart does not have to work hard in this case. You do not huff and puff, but you do stretch and push. Weight-bearing exercise is hard work.

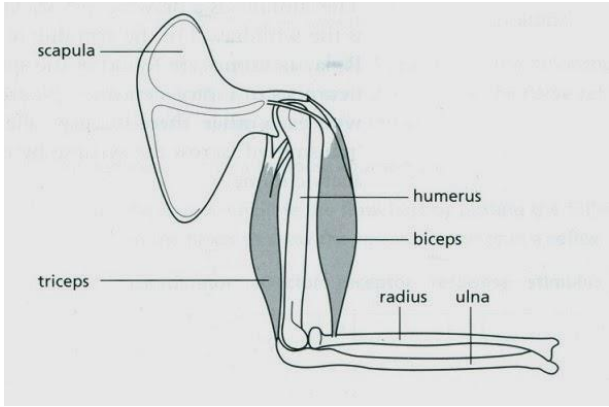
Good forms of weight-bearing exercise are: riding a bike uphill, walking uphill, climbing, lifting weights and swimming.

What can you do for good bone health?

The Human Body 12

Muscles

We use our muscles to move. The muscles are joined to the bones by tendons. Muscles pull on the bones to make them move. Muscles are always in pairs. One muscle pulls the bone forward and one pulls it back. When a muscle is working, (contracting) the other muscle is relaxing. Draw a picture of your arm muscles and label the biceps and triceps.



Muscles are made out of many stretchy, elastic cells and fibers. As well as helping us to move, muscles also help to hold organs in place. The diaphragm muscle under our ribs helps the lungs breathe. Heart muscles make the blood move through the body. Muscles help us to chew food and close our eyelids.

1. Name three functions of muscles.
2. Why are muscles in pairs?

The Human Body 13
The digestive system

Digestion starts when you chew your food and swallow it. Digestion begins in the **mouth** and ends in the anus. In the mouth, when the food is properly chewed, enzymes in the saliva start to break down the carbohydrates. Carbohydrates are in foods like potatoes, rice, pasta, bread and sugars.

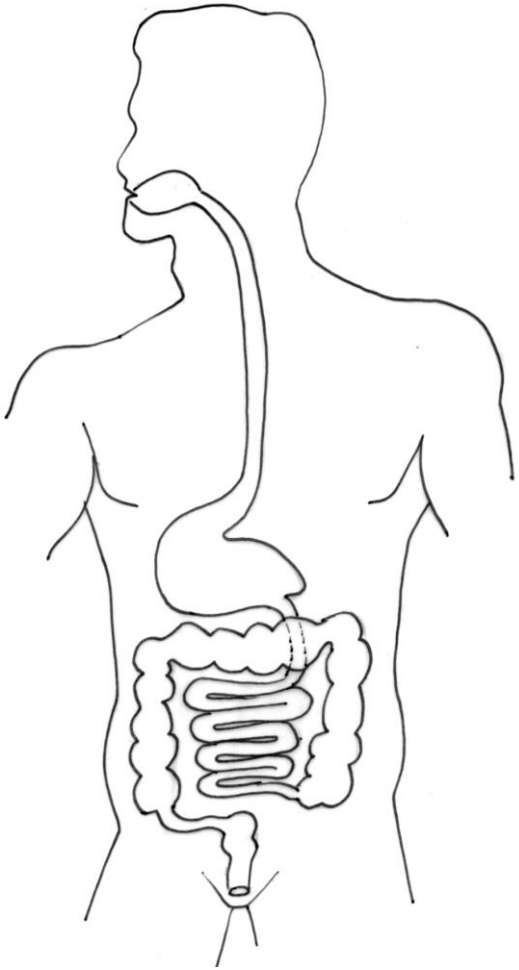
Then the food travels down the **oesophagus**. Muscles in the wall of this tube push the food along after it has been swallowed. The muscles make the food travel in little wave-like movements, until the food arrives in…

- the **stomach**, which is like a bag. Here the food is mixed with digestive juices and acids which break the food down into a liquid state. Little by little, the liquid food passes into…

- the **small intestine.** Here there is more breaking down of the liquid food into smaller particles, until the particles are so small that they can be absorbed into the bloodstream. The wall of the small intestine has tiny hair-like projections called villi. Their job is to absorb the food and deliver the nutrients to the bloodstream. Once the nutrients are in the blood, they travel to where they are needed.
- The waste products pass into the **large intestine**. Water is absorbed here, and is used by the body, but the remaining waste material gets expelled as faeces through the **anus**.

The Human Body 14
Draw the digestive system

Draw and label these parts of the digestive system:
mouth, oesophagus, stomach, small intestine, large intestine, anus



The Human Body 15

Rules for digestive health

Make a poster. Use drawings and some words, (Don't copy all the words below – just the main points.)

- Chew your food well. Your body can't take in the nutrients unless the food is chewed well enough, so that the enzymes and digestive juices can act on it.
- Eat foods that contain the best nutrients, so that your blood can deliver the right fuel to the cells.
- Avoid white, highly processed foods like white flour. These foods slow down the movement of food through the digestive system.
- Eat plenty of fresh fruits and vegetables.

The path of food through the digestive system (copy)

Digestion begins in the _____. Food travels down

the_____ and arrives in the _____.

The food is mixed with digestive_____ and gets

broken down into _____. The liquid passes into the

_____ and then the tiny particles get

absorbed into the _____. The blood takes the

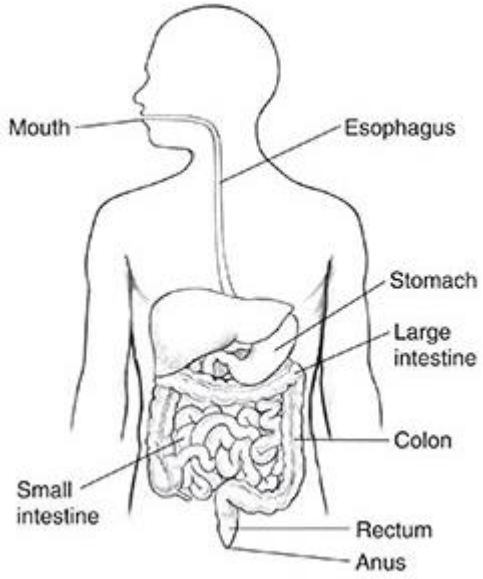
nutrients to the _____. The waste products pass into the

_____ _____and then out through the _____.

Missing words: mouth, oesophagus, stomach, juices, liquid, bloodstream, body, large intestine, anus

The Human Body 16

The digestive system: Quiz



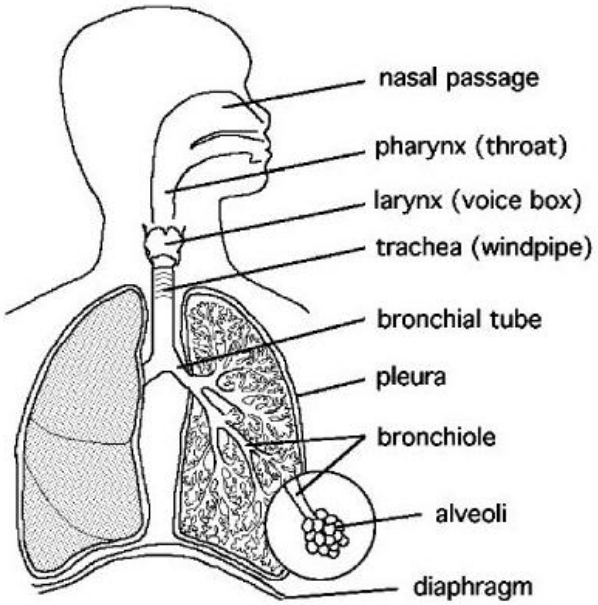
Name the part that these sentences are describing:

1. This is like a bag. Here acid and juices are mixed with the food to digest it.
2. Food that cannot be digested comes out here.
3. This is a long, narrow, bent-up tube. Most of the food is digested here. The goodness from the food is then taken by the blood to all parts of the body.
4. Water is taken out of the food as it passes through this wide tube.
5. Muscles in the wall of this tube push the food along after it has been swallowed.
6. Here the food is mixed with saliva. This saliva starts to digest the food.

The Human Body 17
The respiratory system

Draw a picture of the respiratory system and label the parts. Then draw a line to show the passage of the air from the nose to the bloodstream.

1. nasal passage
2. throat
3. trachea
4. bronchial tube
5. lungs
6. bronchioles
7. alveoli
8. diaphragm



The Human Body 18
Respiratory system: The lungs

Our lungs are organs in the chest. Lungs are used for breathing. The lungs are filled with air and emptied by the up and down movement of the diaphragm. Chest muscles move the diaphragm.

Air passes from the nose, through the trachea, the bronchial tube and bronchioles then into smaller branches where there are tiny air sacks called alveoli.

Oxygen is necessary for all cells to function as tiny energy-giving machines. Without oxygen we would die. We can live without air for a maximum of 3 minutes.

The body also needs to get rid of the waste product called carbon dioxide. The carbon dioxide goes out of our body through the lungs.

The lungs have passageways with many branches like a tree. At the end of the passageways are little balloons called alveoli that fill up with air and deliver oxygen to the blood, which then takes it to the cells. The cells need oxygen to stay alive.

Air is made up of 79% oxygen, 16% nitrogen and 4% carbon dioxide. The air that we breathe **in** contains 79% oxygen. The air we breathe **out** does not contain oxygen because it has been used up by the body cells. But it contains a lot of carbon dioxide as the cells get rid of this waste product after creating energy.

The Human Body 19
Respiratory system: Respiratory health

There are many pollutants in the air that can affect our lungs…things like car exhaust fumes, tobacco smoke, air sprays, dust and gases. These can make the passageways of the lungs inflamed. Smoking is the worst way to damage your lungs and many people who smoke eventually die of lung cancer.

Some people suffer from asthma, when the alveoli (little air sacs in the lungs), tighten up and the person cannot breathe properly for a time. This can be a very frightening experience.

We all need clean fresh air, but it's not always easy to get if you live in the city. It's a good idea to do exercise in fresh air. Going to the beach or a park or bushland where there are trees, is a good way to get fresh air.

Sometimes air inside houses can become stuffy. Remember that we breathe out carbon dioxide. If the air in the house becomes high in carbon dioxide content we feel drowsy. It's good to keep windows open and to go and play outside regularly.

Write three rules for good respiratory health.

The Human body 20
Respiratory system: Summary of the passage of air

Copy the following and fill in the missing words:
Air is breathed in through the _____ and travels to

the _____. Air goes in and out of the lungs

because of the movement of the _____.

The air passes through many branches. At the end of the

branches are little balloon-like structures called

_____. The air then goes into the

_____ and then into the _____.

Air that is breathed in contains mostly _____.

Air that is breathed out contains mostly _____.

This is a waste product that comes from using _____.

Missing Words: nose, lungs, diaphragm, alveoli, blood, cells, oxygen, carbon dioxide, energy

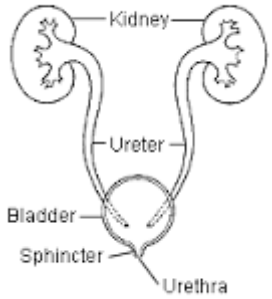
The Human Body 21
The urinary system

The urinary system is made up of:

- kidneys: two bean-shaped organs that filter waste from the blood and produce urine
- ureters: two thin tubes that take urine from the kidney to the bladder
- bladder: a sac that holds the urine until it's time to go to the toilet
- urethra: the tube that carries urine from the bladder out of the body when you pee
- sphincter muscles: allow the flow of urine to start or stop.

Draw a picture of the urinary system and label:

1. kidneys
2. bladder
3. ureters
4. urethra
5. sphincter



The Human Body 22
The urinary system: kidneys

The average kidney is reddish-brown in colour and approximately 10 cm. long. The function of the kidneys is to filter waste products from the bloodstream. The kidneys also remove a type of waste called urea from your blood. Urea is produced when foods containing protein, such as meat, are digested. The body does not need urea, so it gets taken out of the body through urine. That's what gives urine its strong smell.

The kidneys also help to adjust blood pressure and keep check on how much water is in the body. Water is essential to life. Every one of the cells in our body depends on it. If our body is not getting enough water, the kidneys will take steps to slow down the loss of water from the body. The kidneys do this because they work with the lungs, skin and intestines.

If we do not have enough water, our blood can become thick, and we can eventually die. A person can live only 3 days without water.

1. What is the function of the kidneys
2. What is urea?
3. The kidneys get rid of urea and it gets taken out of the body through _____.
4. What other important function do the kidneys have?
5. What happens if you do not drink enough water?

The Human Body 23

The urinary system: water is essential

The urinary system keeps the good salts and certain minerals in our body. If we lose water, we also lose the good salts from our body. Sweat is salty. As we lose water through sweat, we also lose the good salts, which come out through the pores of our skin.

When our body does not have enough water, it is called dehydration. People who are dehydrated can feel faint from lack of water and may get a headache. People who are dehydrated need to drink water containing special good salts to replace the salts that have been lost.

It is important to drink plenty of water before and after exercise. Dehydration puts a lot of strain on the kidneys. We must drink 6-8 glasses of water every day so that we do not get dehydrated and do damage to our kidneys.

Water is essential for brain function, bone function and nerve function. It is required for making energy in the cells, and for digestion. Lack of water creates all kinds of illnesses, including heartburn and ulcers. Many people are dehydrated, but they don't know it. You can become dehydrated through not drinking enough water. You may not even feel thirsty, but you can still be dehydrated. Many people think that water is not tasty enough. That's because they are used to drinking other drinks like fruit juice and fizzy drinks. But these drinks actually take water out of the body at the same time as putting it in. So they do not hydrate the body very well. We need to have plain water to do this.

1. What does *dehydrated* mean?
2. Why is it bad to be dehydrated?
3. What is water used for in the body?

The Human Body 24

Summary of the urinary system

Copy:

The main function of the urinary system is to remove _____ from the body and keep the good salts in our _____. If we don't drink enough water our blood can become _____. A person can live without water for only _____ days. We must drink water so that we don't become _____. When we are dehydrated our body systems do not _____ properly. We should drink _____ glasses of water per day. Fizzy drinks, are not good sources of water because they take water _____ of the body at the same time as putting it in.

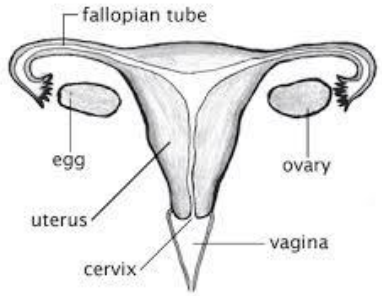
Missing words: waste, cells, thick, three, dehydrated, function, six, out

What should we do for health of the urinary system?

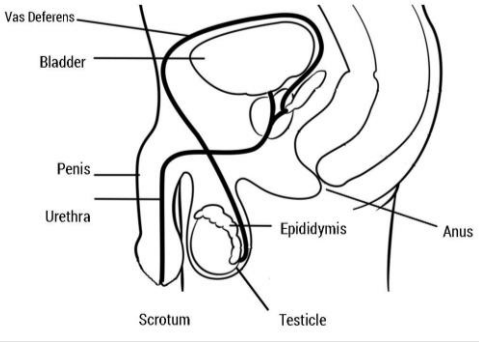
Ans: Drink plenty of _____.

The Human Body 25
The reproductive system

Female: ovaries, uterus, uterine tubes, vagina, mammary glands



Male: scrotum, testes, penis, prostate glands



The reproductive system is responsible for the continuation of the human race. The male and female systems are composed of several organs. The male testes and female ovaries produce single cells. Males produce sperm cells and females produce ova. A sperm and an ovum join together to form a new person.
1. In males _____ are produced in the _____.
2. In females, _____ are produced in the _____.

The Human Body 26
The reproductive system: Hormones

Puberty is the time when there are great changes to the body. This usually happens in early teenage years. Many changes take place in the male and female body at puberty.

The testes and ovaries secrete hormones to make these changes happen. Hormones are little messenger substances that tell the body what to do. The main female sex hormones are estrogens and progesterone. The main male hormone is testosterone. These hormones tell the body when it is time for the reproductive system to change and develop.

The female reproductive system allows for growth of the foetus, (the tiny new baby being formed). Hormones control the development of the baby, and the production of milk for feeding the new baby after birth. The foetus develops in the uterus for nine months, until it is time for birth.

The body must produce exactly the right amount of each hormone for good reproductive health. If hormones get out of balance, (too much of one or too little of another), the reproductive system may not function properly. Man-made chemicals in processed foods, perfumed products and household cleaners and sprays can upset the balance of hormones. It's best to cut down on such chemicals if possible.

Copy:
The testes and ovaries secrete little messenger substances called _____. Hormones give the body the signals for making changes, such as the changes that occur at _____. Hormones can be put out of balance by man-made _____.

Heredity 1
Each person has special traits

Traits are the things that make you who you are: the way you look, your personality.
The human body is made of cells, and inside our cells are genes. Genes play an important role in determining physical traits — how we look, our personality traits, our gifts and talents. They carry information that makes you who you are and what you look like: curly or straight hair, long or short legs, even how you might smile or laugh. Many of these things are passed from one generation to the next in a family by genes.

Think of a family that you know well. It can be your own family if you like. Name the family members. Explain how some of the traits of the parents are expressed in the children.

Heredity 2
What Is a Gene?

Each cell in the human body contains about 25,000 to 35,000 genes. Genes carry the information that determines your traits, which are features or characteristics that are passed on to you — or inherited — from your parents.

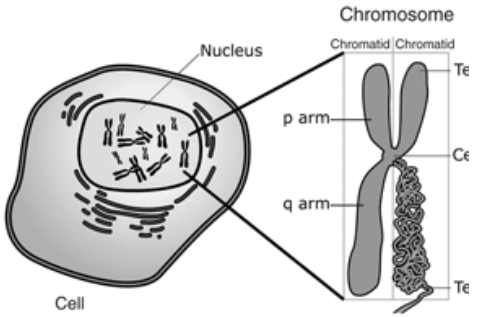
For example, if both of your parents have green eyes, you might inherit the trait for green eyes from them. Or if your mom has freckles, you might have freckles too because you inherited the trait for freckles. Genes aren't just found in humans — all animals and plants have genes, too.

Genes are so small that you can't see them. Genes are found on tiny spaghetti-like structures called chromosomes, and chromosomes are found inside cells. Your body is made of billions of cells. Cells are the very small units that make up all living things. A cell is so tiny that you can only see it using a strong microscope.

Chromosomes come in matching sets of two (or pairs) and there are hundreds — sometimes thousands — of genes in just one chromosome. Chromosomes are found in the centre part of the cell called the nucleus.

In humans, a cell nucleus contains 46 individual chromosomes, or 23 pairs. Half of these chromosomes come from one parent and half come from the other parent.

1. What is a cell?
2. What is a nucleus?
3. What are genes?
4. Where are they found?



Heredity 3
How Do Genes Work?

When a baby is being formed in the mother's womb, each pair of genes inside the cells, is carrying out a specific job. Within each pair of genes there are specific instructions—much like in a cookbook recipe — for making proteins in the cell. Proteins are the building blocks for everything in your body. Bones and teeth, hair and earlobes, muscles and blood, are all made up of proteins. Those proteins help our bodies grow, work properly, and stay healthy.

Genes come in pairs. Each of your parents has two copies of each of their genes, and each parent passes along just one copy to make up the genes you have. Genes that are passed on to you determine many of your traits, such as your hair color and skin color.

You also can see genes at work if you think about all the many different breeds of dogs. They all have the genes that make them dogs instead of cats, fish, or people. But those same genes that make a dog a dog also make different dog traits. So some breeds are small and others are big. Some have long fur and others have short fur. Some dogs have genes for white fur and black spots.

1. Where are genes found?
2. What instructions do they give to the body that is being formed in the mother's womb?
3. Why are there so many different breeds of animals?

Heredity 4
After their own kind

God created all the animals after their own kind, (Genesis 1:25). A *kind* is like a family of animals, like the dog family or the cat family. That means that only dogs can breed with dogs. Only cats can breed with cats. Donkeys can breed with horses because they both belong to the horse family.

Humans are the most special kind of being that God created. Humans cannot breed with animals. Humans did not come from monkeys. Monkeys are a kind of their own, totally separate from humans. Only humans have a free will to accept or reject Jesus, and to choose to live with God or not to live with God.

Some people ask, "If all people are descended from one family, what about apemen?"
The idea of apemen is an evolutionary idea, not a Biblical one. Some scientists claim that there are fossils that are between humans and apes, but this is really not the case.

Read and write out Psalm 139:13-15. Draw a picture of this.

Heredity 5
All people in the world are related to Noah

If all people descended from Noah's family, you might ask, "Why don't all people speak the same language?

God created Adam and Eve to be the parents of everyone, so we are all related. And Adam's children, and their children after them, spoke the same language all the way to Noah. And then only Noah's family survived the Flood. So, all Noah's descendants spoke the same language even hundreds of years after the Flood. (Genesis 1:26-27)

Then something changed. After the Flood, Noah's descendants turned away from worshipping God. They did not spread out over the earth as God commanded, but instead built a huge tower to show how mighty they were without God. This made them feel like they didn't need God or His commandments. So, to force them to spread out across the world, God confused their language. Suddenly, people were speaking different languages and couldn't understand each other. People groups that spoke the same language started to move away from the Tower of Babel and the Tower was abandoned. (Genesis 11:1-9)

Noah and his family had genes for all the different traits that we see in all people groups today. But as people went off and lived in smaller groups (because of language), their children, and children's children expressed certain genetic traits, such as dark skin or light skin, blue eyes or brown eyes, curly hair or straight hair.
Draw a diagram to show how different people groups came about.

Heredity 6
Where did all the races come from?

The Bible refers to people groups as 'clans of people' or 'nations', not different races of people like we hear about today. All people alive today are descended from Noah's family, but as family groups moved away from Babel, they became isolated from everyone else. Over time, different features became dominant in different populations, so that, for instance, people in Africa and the Australian Aborigines have darker skin than people in Europe do, and people in China and Japan have almond-shaped eyes. But all these differences are very minor compared to all we have in common. 'Race' is just a convenient word to use for the appearance and customs we associate with different people groups. (Genesis 10:32)

A great big family

Some people think some races are better than others, but this of course is not true. Because the Bible is so clear that we are one great big family, it teaches that we are really all the same. We may look different from each other, or have different customs or languages, but everyone is equally valuable.

The Bible says that in Christ, there is no Jew or Greek, which is another way of saying that all races are brought together. And it also says that in Heaven, people from every "tribe, tongue, and nation" will be there worshipping the Father and Christ. This is why it is so important for the Good News about Jesus to be preached in every part of the world.

Explain why different people groups have similar traits.

Creation 1
World view

A person's worldview is what they think about these questions:

- Where did we come from?
- Why are we here?
- How do I know what is true?
- Where are we going?

Where did we come from?
Most people think that we are either created by God or a product of evolution.
Genesis chapters 1 and 2 gives the true account of Creation. Is it science, history or belief?
If it's science, then it must conform to the Scientific Method.
The Scientific Method is when we conduct a science experiment to see if something is true. We have to be able to watch it happening, and do it again. That means it has to be "observable" and "reproducible".

Questions and answers
Who observed the formation of the Universe?
Ans: *No one was there.*
Who can reproduce it?
Ans: No one can reproduce it.

But we *know* the One who was there. So we can say that the Genesis account is not science but history. Because God's is reliable, and His word is reliable, we know that it is true history.

How would you explain to someone the answers to the four questions on life, from a Christian viewpoint?

Creation 2
Science or history?

We should not study the Genesis account as Science because it does not follow the principles of the Scientific Method – it's not observable or reproducible. No one saw God creating and no one can do what God did. The Creation account is therefore *history*.

But the theory of evolution cannot be studied as science either because it does not conform to the Scientific Method. No one was there to see the beginning of life as evolutionists describe it and no one has ever seen one species developing into other species. No one can reproduce evolution. It's not "observable" and "reproducible". But it's not history either.

The Creation account is history, not science. (HIS story)
The theory of evolution is *neither* history nor science because there is no evidence for the theory.

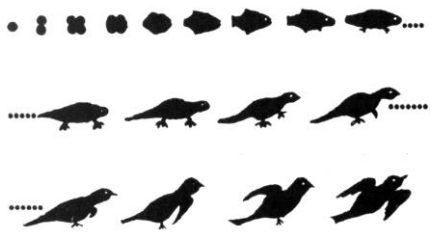
The theory of evolution is based on a belief that there is no God. It was invented by those who did not want to believe in a Creator.
The Creation account is based on belief in the true God, who is reliable and trustworthy.

1. *Why can we say that Genesis is true history?*
2. *Why is the theory of evolution not science?*
3. *Why is the theory of evolution not history?*

Creation 3
How old is the earth?

Who came up with the idea that the earth is millions of years old?
Answer:
Those who wanted to ignore God and please themselves. If there's no Creator, no God, then there's no such thing as sin and we can do what we like.

Evolution states that a living thing was created out of nothing.
Then it developed and changed and developed and changed…
Until we have the living things in our world today.



The problem for evolutionists is…
We don't *see* living things changing.
Their solution…
Millions of years! If the changes took that long, we wouldn't see them in a human lifetime.

1. *What is the motive of evolutionists?*
2. *What is the theory of evolution?*

Creation 4
Mutations

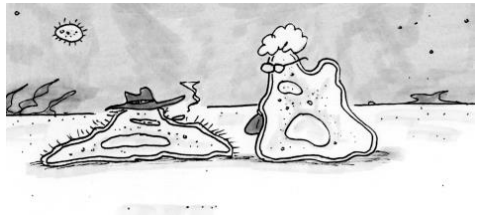
Evolutions states that:

- Living things only make changes through genetic mutations.
- Mutations are mistakes in our genes. Genes are like a recipe within our cells for the makeup of someone, like hair colour or eye colour.
- But sometimes things go wrong. A person or an animal can be born with something wrong, like a cleft palate. This is a mistake in the genetic code. There is a *loss* in genetic information, which can be passed on to the next generation.
- The genetic codes in living things are not getting better. So how could pond scum have developed into something as beautiful as a bird? How could the beautiful animals in our world have developed from mistakes?

A featherless rooster developed through a mistake in the genetic code. Without feathers the rooster will fry in the sun and freeze in the cold. This is not an improvement! Mutations only create living things with problems.

Where did mutations originate? The Fall.
Until the Fall, God's creation was perfect.

1. *Write Genesis 1: 31.*
2. *What are genetic mutations?*
3. *Living things in God's beautiful world could NOT have been created through mutations? Why not?*



Creation 5
How do we know what is true?

We must believe the whole Bible, not just parts of it. Genesis 1 is Bible history and does not have an alternative meaning. It is what it is.
Mark 5:46-47: But Jesus said, "If you believed Moses, (who wrote Genesis) then you would believe Me, but if you do not believe his writings, how will you believe my words?

The Word of God is powerful, sharper than a two-edged sword, (Hebrews 4:12).

The Holy Spirit guides us into all truth. (John 16:13)

Was Adam a real person?
If we add up the genealogies in the Bible, starting from Adam, we can calculate the age of the earth - just 6,150 years old.
If Adam was not a real person, then his son Cain was not a real person either. And Cain's son was not a real person. And now we have destroyed the history of the Bible, making it into a fairy tale. Where do the fairy-tale characters stop and the actual people start? The answer is, there are no fairy-tale characters. They are *all* real people.

Sin came into the world through one man (Adam) and sin has been defeated by one man (Jesus). This only makes sense if both Adam and Jesus are actual men. (Romans 5:12)

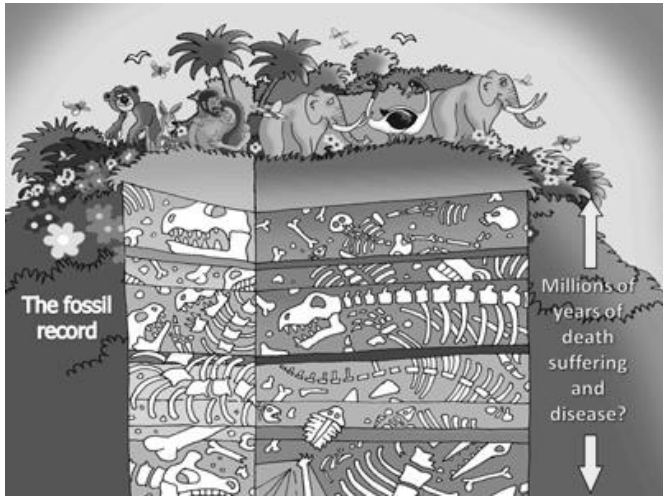
1. *Who wrote Genesis? How does this apply to Mark 5:46-47?*
2. *"The historical parts of the Bible do not need interpretation." Explain the meaning of this.*

Creation 6
Could God's creation have happened through evolution?

Some people say: "Couldn't God have created the first living cell and under His supernatural guidance, more complex life developed over millions of years?"
Problem:

- This contradicts the Bible
- God says He created in six 24-hour days.
- God said His creation was good.
- If living things evolved over millions of years, there would have been much death and suffering along the way.

There would be pain, death, killing, disease, thorns, struggle, suffering and extinction, as the weaker species die out and the fittest survive. This could not be the perfect creation of a good God.



Create your own drawing of this one. Underneath, explain why, according to the Bible, the beautiful living things at the top could not have come about after millions of years of death, suffering and disease.

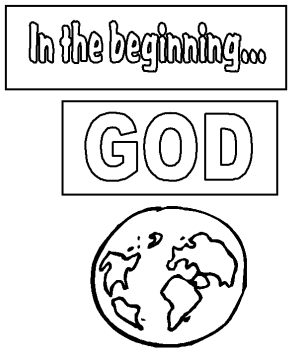
Creation 7
The order of events

Order of events according to the Bible:

- God created a perfect world, with no death, no pain
- Man sinned and the perfect world was cursed.
- Jesus came to earth to redeem us from the effects of the Fall.
- A new heaven and earth, and the perfect creation will one day be restored.

Order of events according to evolution:

- At the beginning of the universe there was only one living organism.
- The organism evolved into different species, involving millions of years of death and struggle.
- Finally, man evolved and was born into a world of death and pain.



1. *Draw a time line showing the order of events according to the Bible. Include pictures or symbols.*
2. *Why is the order of events according to evolution incompatible with God's character?*

Creation 8
What about dinosaurs? Aren't they millions of years old?

Dinosaurs were created on day six of creation along with the other land animals. They are just an extinct species. Their bones are falsely dated to support belief in evolution. They lived at the same time as humans.

The Bible describes dinosaurs in the book of Job. Job's description of Behemoth and Leviathan are clearly descriptions of dinosaurs. That means Job, or someone in history must have seen one.

"Look at the monster, Behemoth…what strength there is in his body; and what power he has in his muscles! His tail stands up like a cedar…his bones are as strong as bronze and his legs are like iron bars." Job 40:15-24

"Can you catch Leviathan with a fish hook? Can you fill his side with fishing spears? Touch him once and you'll never try it again…no one would dare to stand before him. No one can tear off his outer coat or pierce the armour he wears…his back is made of rows of shields fastened together and hard as stone…smoke comes out of his nose…flames blaze from his mouth and smoke (Job 41:1-34).
That sounds like a dinosaur!

1. *Did humans and dinosaurs live at the same time? Explain your reasoning.*
2. *How could Noah have taken dinosaurs on the ark?*

Creation 9
The Great Flood

Evolutionists have misinterpreted the evidence of the Great Flood. The truth is, fossils were buried quickly in a short space of time, not over millions of years.

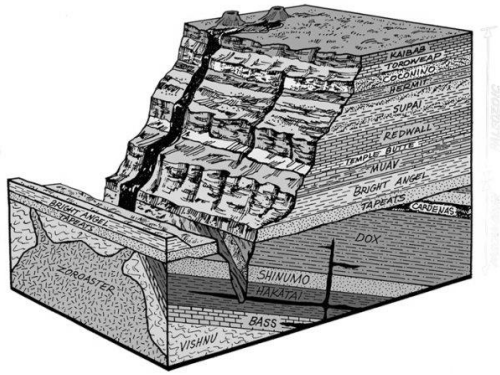
Evolutionists need long ages to support their theory, so use a base line of millions of years when dating geological specimens and features.

The Grand Canyon was not formed over millions of years, but quickly. It was a product of the Great Flood.

Radioactive dating methods are a measure of the rate of decay and are used to try and measure how old things are. It is assumed that the rate of decay is consistent, which is false for a start. Radioactive dating only measures thousands of years, not millions, so a baseline of millions of years is formulated, then the extra years added on. The Great Flood accounts for the land forms we see today.

What is the meaning of a "base line" when measuring age of fossils and geological specimens?

How were layers formed?



Creation 10
Why does it matter what we believe?

People believe that the universe is millions of years old because school text books are written this way. TV nature documentaries sound so convincing. Tourist signs tell us about millions of years. "Surely all these people can't be wrong?" people say.

Why does it matter?
Self-worth – Do we feeling loved, valued and accepted or are we the product of pond scum? (Psalm 139 – we are wonderfully made. God knew us before we were born.)
Marriage – From the beginning of creation God made them male and female (Mark 10:6).
Salvation – Jesus came to restore the consequences of the Fall, giving us the opportunity to be a child of God. But if we believe in long ages, we can't logically believe in a Fall because there would have been sin and death in the world before man entered the world.

Why are we here?
If we are a product of evolution, then we are here by chance and there is no real purpose for us. No one is in charge of us and we can do what we like. But if we believe that we were created in God's image, then we know that God has a special plan for us to fulfill on this earth, and we live according to His standards.
Where are we going?
The Bible not only tells Christians that we will be with God after death, but also that God has a plan for the end of the age. Jesus will come again to establish a new heaven and earth, where once again there will be perfection.

How does a belief in evolution affect many aspects of life?

Space 1
How many stars?

Have you ever considered the greatness of the universe? David, who wrote the Psalms, must have considered the greatness of God as he watched the stars each night while tending his sheep. Our solar system, and the stars beyond it tell us how great and mighty God is. The Bible says, "The heavens declare the glory of God." (Psalm 19:1)

Isn't it wonderful to know that such a great and powerful God cares for us? He knows each person by name and knows all about us. We can put our trust in God because He is so great.

When we look at the sky on a clear night, we can see thousands of stars. By using a telescope we can see many more. Stars are huge balls of flaming gas. Most stars are millions of kilometres from one side to the other. Each star burns at amazingly hot temperatures and so brightly that they can be seen from billions of miles away.

No one knows how many stars there are, except for God. He has counted and named all of them.

In the Psalms we read: *He counts the number of the stars and calls them each by name. Great is our Lord and mighty in power. (Psalm 147:4-5)*

A small number of stars in a group is called a **constellation**. One constellation in the Southern Hemisphere is the *Southern Cross*. A large group of stars, made up of many constellations is called a **galaxy**. *The Milky Way* is a galaxy.

1. What is a star?
1. How big is a star?
2. What does the size of the universe tell us about God?
3. What is a constellation? Name one.
4. What is a galaxy? Name one.

Space 2
Our Solar System

Only a great and powerful God could create such a huge universe! And yet He has placed us carefully in a very special place in the universe. He has given us our own special star, the Sun, for light and heat. He has placed us at exactly the right distance from the Sun. Our solar system is made up of a small star called the Sun and eight planets, including Earth. These planets travel around the Sun. The Sun is the Earth's nearest star.

The eight planets have moons, which circle them. There are also some other objects, including comets. All of the planets, their moons and the comets, move in the way they do, because of the Sun's gravity.

Our planet, the Earth, is third in line from the Sun. The planets are quite different. Their differences are largely the result of their different distances from the Sun. The four planets that are closest to the Sun are called the inner planets. They are small, rocky planets. The outer planets are larger and gassy.

Only one of these eight planets is suitable for living things. The earth is just the right temperature, and has air and water. All the other planets are too hot or too cold, and have no air or liquid water. Earth is the planet that God has designed for life. Man may be able to live on other worlds one day, but making a place like the moon suitable for living on would be very difficult. So many things would have to be brought in spaceships from the earth. When astronauts go into space, they can only stay alive because of the air, water and food that they take with them from earth.

1. What is a solar system?
2. How many planets in our solar system?
3. Why is earth a special planet?

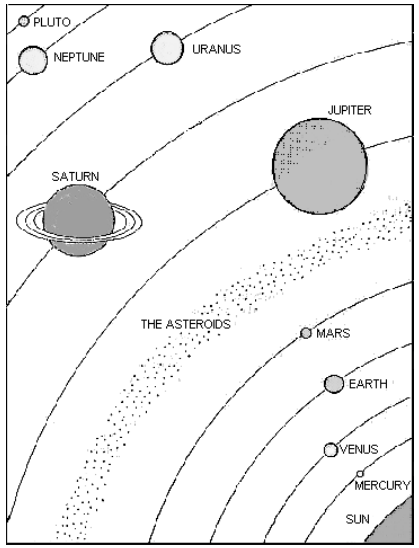
Space 3
Planets in our Solar System

There are eight planets in our solar system.
Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune

Draw the eight planets in their right order. Name them and draw them the correct sizes. Show the Sun as well.

Learn a silly saying to help you remember the names of the planets:
(The starting letter of each word is the starting letter of a planet.)
My **v**ery **e**nergetic **m**other **j**umps **S**aturdays **u**ntil **n**ight-time.

Until 2006 there were nine planets in our solar system, the ninth being the small planet called Pluto. Scientists decided that Pluto did not fit into the planet category. Instead it has been placed in the category of dwarf-planets, of which it is the second largest.



Space 4
The Sun

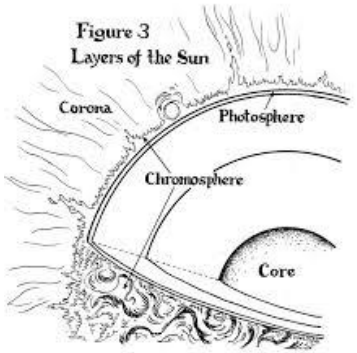
Think of what the world would be like without the Sun. There would be no life, no light, no warmth, no sounds.

The sun is a star. To us, the Sun seems bigger than all the other stars, but this is only because it is the nearest star to Earth. The Sun is a huge ball of gases. These gases are mainly hydrogen and helium. The atoms come together and explode because of the high temperature and pressure. This is called nuclear fusion. When this happens, a huge amount of energy is released. The energy is in the form of light and heat. The Sun provides light and heat to the Earth.

No one should look at the Sun without protecting their eyes. The intense light comes from a layer of gases on the surface of the Sun. This layer is the *photosphere*, the layer of light.

Above this is another layer, made up of brilliant red-coloured gases: this is called the *chromosphere*, the layer of colour.

A third layer is called the *corona*, which means *crown.* This can be seen through a telescope during an eclipse. Sometimes great tongues of flame shoot out from the Sun. These are called *solar flares.* At times, dark patches can be seen on the Sun. These are *sunspots.* These can affect the weather on the Earth.



Draw a picture of the sun showing the layers. Write one fact about each layer**.**

Space 5

How did it begin?

Many people think that the Universe all started with a big bang, about 15,000 million years ago. People who believe in the Bible know that this isn't true. The Universe was designed by a powerful Creator, only thousands of years ago. People who believe in the *big bang*, also believe in *evolution.* That is, that everything started from chemicals which came together and somehow formed a living cell. That cell developed and changed, and developed and changed until all kinds of living things came into being.

People who believe the Bible know that that God designed the Universe, and had a perfect order for doing it, and that it was created in just six days. Read about the order in the first chapter of Genesis.

Did you know that plants were created on the third day? They were created even before the Sun, moon and stars. The Sun, moon and stars were created on the fourth day. The plants needed the warmth of the Sun for growth, so God had to quickly create the Sun, just 24 hours later. Once God had created plants for food, then He could create the animals and humans. God had a perfect order and His timing was perfect too. It took Him just six days, and not millions of years.

God said that there was no death before Adam and Eve sinned. The world was perfect until that time. People who believe that the world developed over millions of years believe that death occurred before humans came to the Earth. The Bible tells us that this is not so.

1. What is evolution?
2. What does the Bible say about the beginning of the universe?

Space 6

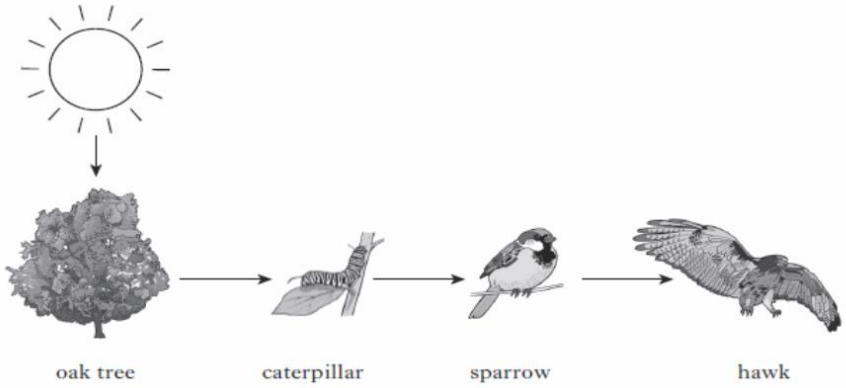
Food chains

Think of what the world would be like without the Sun. There would be no life, no light, no warmth, no sounds. There would be no people, plants or animals. God created the Sun for life. All things that move or grow use **energy**. All plants and animals use energy. Think about this:

The Sun helps plants to grow.
We eat the plants.
Animals eat the plants.
We can also eat the food that comes from animals.
So we get energy from the Sun every time we eat

This is a food chain. Food chains all start from the sun's energy.

Draw a picture of a food chain a bit like the one below. Use different plants and animals. Put yourself at the end of the food chain.



Space 7
Sun facts

Did you know…?
People in Europe many years ago thought there must be a god who drove the Sun across the sky. To honour this god, they named a day of the week after the god. The day became known as Sunday. How wonderful to know who really makes the Sun rise and set.

Did you know…?
The Sun does not really move at all, but it is the Earth that moves. It just *seems* like we are still and the Sun is moving. Take notice of where the Sun is early in the morning; at mid-day and in the late afternoon. On a sunny day you could try making a shadow stick and draw the shadow lines with chalk at various times during the day.

Sun safety
Too much radiation can be dangerous, and may cause skin cancer. Make a drawing to show how can we protect ourselves from the Sun's rays?

Sun-shape poem
Write the word **SUN** inside a circle, then write describing words for the Sun, coming from the circle like rays of the Sun.

Space 8
Planet Earth

The Sun sends heat and light to all of the planets in our Solar System. The amount of heat energy that reaches each planet depends on how far that planet is from the Sun. Our earth is just the right distance from the Sun. Just enough heat energy and light energy reach the earth to give it a mild climate where plants and animals can live.

The Earth
The Earth is the only planet that has life, and the only planet that has flowing water on its surface. Almost three-quarters of the Earth's surface is covered by water.

The pull of the Earth's gravity traps a layer of air called *atmosphere*. The atmosphere is has been provided by God as protection against large meteors. When they hit the atmosphere they bounce off into space, and do not crash through on to the Earth. The atmosphere also protects from the Sun's harmful rays, and of course provides air for breathing.

Space 9

The Earth's moon

Other planets have moons too, but the Earth's moon is the only place in the solar system apart from Earth, where man has set foot. Between 1969 and 1972, a total of 12 astronauts landed on the Moon.

Many astronauts have told how they put their trust in God, as they traveled into space. Being in space made them feel very close to the creator of the universe!

The moon's gravity is only one-sixth of the Earth's, so there is no atmosphere and no air.

The moon has craters. We can see them from the earth.

The Moon reflects the Sun's light, so it lights up the night sky. God also created the Moon to show the seasons.

God said, *And let them be for signs and for seasons, and for days and years…And God made two great lights: the greater light to rule by day, and the lesser light to rule the night." (Genesis 1: 14 and 16)*

The Moon also causes tides, which are necessary for keeping the sea clean. If the water in the sea didn't keep moving, then it would become stagnant and the plants and animals would die.

Write 5 facts about the moon.

Space 10

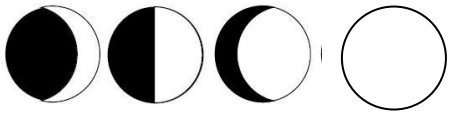
Shapes of the moon

Have you noticed that the moon has different shapes? At times it looks round, at other times it looks half round. Sometimes it looks like a cookie with a bite out of it.

What causes the Moon's shapes?

Like the earth, the moon receives direct sunlight on only one side. The different shapes are cause by different amounts of sunlight shining on the moon. Here are some of the shapes:

1. crescent
We see less than half of the moon's sunlit side.
2. half moon
We see half of the sunlit side.
3. gibbous
We see more than half, but not all of the sunlit side.
4. full
We see all of the sunlit side when the moon faces the earth.



The different shapes of the moon are called phases. It takes 30 days for the moon to go through all its phases.

Draw and label the four phases of the moon.

Space 11

Mercury

- Mercury is the smallest planet in the Solar System:
- Mercury is the most cratered planet in the Solar System:
- Mercury is only the second hottest planet. (Venus is the hottest.)
- Mercury is the closest of the eight planets to the Sun. The side of Mercury that faces the Sun is 415 degrees C. That's as hot as a pottery kiln! However, as the planet turns away from the Sun at night time, the temperature plunges to minus 170 degrees C.
- Mercury has just 38% the gravity of Earth,
- Only two spacecraft have ever visited Mercury. Because it is close to the Sun, Mercury is a difficult planet to visit. During 1974 and 1975 Mariner 10 flew by Mercury three times, during this time they mapped just under half of the planet’s surface. Mariner 10 sent back pictures of a rocky planet, a third the size of the earth, and covered with craters.

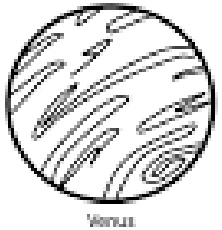
Write 5 facts about Mercury.

Space 12

Venus

- Venus is the hottest planet. It is 475 degrees C.
- Venus is just slightly smaller than the Earth.
- It has an atmosphere mainly of carbon dioxide. That is a poisonous gas.
- It has gravity similar to that of Earth.
- Venus is surrounded by clouds made of acid gases.These clouds create the most corrosive acid rain found anywhere in our solar system.
- The clouds are so thick that little light even reaches the surface. The light that does reach the surface is converted to heat and can not escape the atmosphere making Venus the hottest planet at around 500 Degrees Celsius.
- The surface of Venus is often described as a "stormy desert" full of many craters and very active volcanoes.
- The surface is also likened to molten lead.
- Venus has no liquid water.

Write 5 facts about Venus.



Space 13

Mars

- Mars is a rocky red desert.
- Mars is slightly smaller than the Earth.
- Mars has two moons and some gravity.
- Mars looks like a red star in the sky.
- Mars is home to the tallest mountain in the solar system:
- Mars has the largest dust storms in the solar system:
- On Mars the Sun appears about half the size as it does on Earth:
- People used to think there was life on Mars. That's where we get the name 'Martians' from. However in the 1970s, space probes visited Mars and found that there was no life there. Christians do not need to worry about and extra terrestrial beings or UFOs because we know that God created the Earth for life and not other planets.

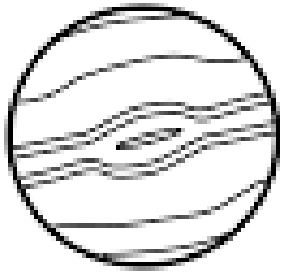
Write 5 facts about Mars.

Space 14

Jupiter

- Jupiter is the largest planet in our solar system.
- It is 13,000 times bigger than the Earth!
- It is a huge ball of liquid wrapped in thick colourful gas clouds. The gases that surround Jupiter are deadly poisonous
- The quick spinning of the planet whips up the atmosphere, creating the bands around the planet.
- Jupiter has a great red spot, about the size of the Earth. This is caused by a storm in the planet's atmosphere.
- At the centre of Jupiter is a rocky core, slightly bigger than Earth but weighing about 20 times more.
- Jupiter has a very strong magnetic field. You would weigh two and a half times as much as you would on Earth.
- Jupiter has many moons circling around it. Four of these moons are bigger than Pluto.

Write 5 facts about Jupiter.

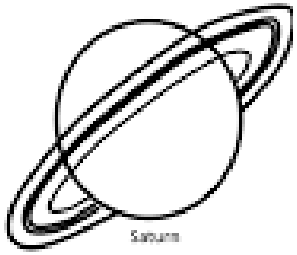


Space 15

Saturn

- Saturn is the second biggest planet.
- It has rings which are made of rocks, the size of bricks coated in ice. The rings are 10 km. thick.
- Saturn is mostly made of gas. It is very light beacuse it is made up of more hydrogen than helium.
- It is very cold. It has 18 moons.
- Saturn has a small rocky core covered with liquid gas.
- Like Jupiter, Saturn has many moons which surround it.
- Storm winds race around the atmosphere at 800kmp/h.

Write 5 facts about Saturn.

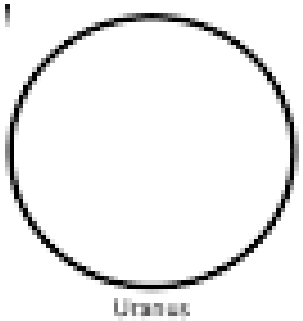


Space 16

Uranus

- Uranus is a cold ball of gas.
- Uranus is about 4 times bigger than the earth.
- It spins slowly, and one day is 40 Earth years.
- The gases on Uranus are mostly hydrogen and methane.
- It looks green because of the methane gas.
- Uranus was the first planet discovered by telescope.

Write 5 facts about Uranus.

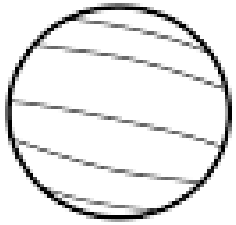


Space 17

Neptune

- Neptune is a large, water planet with a blue hydrogen-methane atmosphere and faint rings.
- Neptune is a large planet, nearly four times the size of Earth.
- Neptune has the most violent weather in our Solar System. Storms have been spotted swirling around its surface and freezing winds that blow about ten times faster than hurricanes on Earth make it the windiest planet.
- Neptune is covered in thin white clouds which stretch out around the planet.
- Neptune takes 165 years to go around the Sun.
- It is a ball of hydrogen and helium gases with a rocky core surrounded by ice.

Write 5 facts about Neptune.



Space 18

The first astronomers

People who study the stars are called astronomers. It is very likely that the first astronomers were shepherds, who had plenty of time to watch the stars as they tended their sheep. During the long still nights, they probably watched the moon, as it gradually changed its shape night by night, from crescent, to full moon and back to crescent. The period of time, almost 30 days, became known as a month. The word month comes from the word moon. Later they learned to count the time it took the sun to travel from its highest place in the heavens and back to its point of starting. This became known as year. What people didn't realize was that the journey of the sun was really caused by a change in the position of the earth, as it journeyed through space. That is to say, the sun stood still but the earth moved.

There was one famous astronomer who lived from 1564-1642. His name was Galileo. He developed a telescope to watch the stars. He became convinced that the earth moved around the sun, and not the sun around the Earth. No one would believe him, but he set out to prove it was true. And he did!

1. Who were the first astronomers?
2. What did the shepherds notice about the Moon?
3. What did they notice about the Sun?
4. What did Galileo discover?

Space 19

Who were astrologers?
Astrologers were people appointed to the king, in olden days, to note the movement of the stars. Their job was to learn about the stars. However, they became dishonest. They turned to fortune-telling and tried to trick people into believing they could tell the future.

These days, many people still practice astrology. They ask people when they were born, and tell them their star sign. Then they try to tell people what will happen to them in the future. Many astrologers look to using Satan's power. If anyone ever asks you for your star sign, just ignore them. Don't get fooled into playing their game, even in fun. Astrology is the opposite of God's truth.

1. Why was the job of the first astrologers useful?
2. What happened when they became dishonest?
3. What is wrong with the astrology that some people practice today?

Space 20

The first men to land on the moon
Astronauts are space explorers. There is no air to breathe in space so astronauts must wear special suits to stay alive. Apollo spacecraft are designed for moon missions. They carry all the air, water, food and equipment the astronauts will need in space. Rocket engines, fuel, oxygen and electric power supplies are carried in the back of the service module. The Apollo Command Module is about the size of a small car and it has two windows. Here the astronauts work, eat and sleep. They cannot move very far. A trip to the moon takes about four days.

On July 20th 1969, Neil Armstrong was the first person to ever walk on the moon. Astronauts' space suits have to be sealed tight so that their oxygen doesn't escape. On the moon, an astronaut wears a backpack filled with oxygen for breathing, water for controlling temperature, and radio equipment for talking to the Apollo Command Module and people back on earth.

Moon Rover is a special car that the astronauts bring with them. It travels on the surface of the moon bringing tools, TV and radio equipment so they don't get lost.

On the moon everything weighs much less than on earth. This is because there is less gravity. Everything weighs one sixth of its earth weight. The astronauts bounce and float around. The astronauts leave a flag on the moon, and collect moon rocks to bring back to earth.

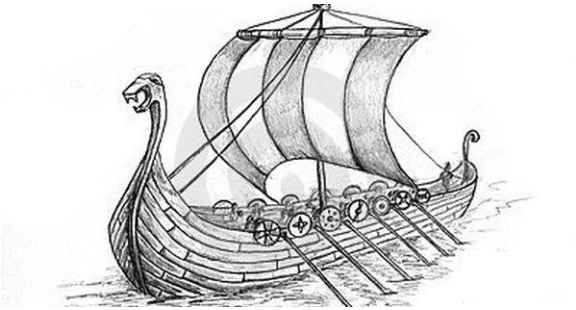
Pretend you are an astronaut going to the moon. Write a story about it.

Sea voyages 1
The Vikings

The Vikings were pirates from the Scandinavian countries of Norway, Sweden and Denmark.

The Vikings traveled the seas of between AD 700 to 1100. They traveled to countries such as Britain and Ireland. Some went to fight and steal treasure. Others settled in new lands as farmers, craftsmen or traders. The Vikings also made discoveries of new lands: Iceland, Greenland and North America.

They used the sun and stars for navigation. They also carried with them a cage of ravens. When they thought they were near land they would release the ravens. If the ravens returned, they knew they were not near land. If they didn't return, they knew that land was close by.



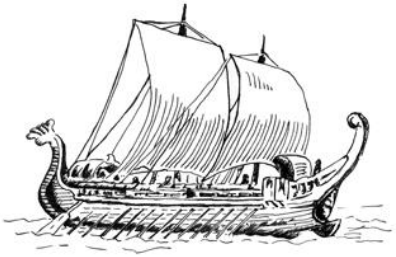
1. Draw and describe the Viking's boat in words.
2. How was the boat propelled? (2 ways)
3. Where else in history is there a recorded information about releasing birds to find out whether land was near?

Sea voyages 2
The Phoenicians

The Phoenicians were the people that came from the lands we know today as Syria, Lebanon and Northern Israel. They were masters of sea travel covering great distances in their ships of trade and war. History records from the 6th Century BC show that they were the first people to travel to the Atlantic coasts of Africa and Europe. Jonah would have traveled on one of these ships.

When making short trading trips they traveled close to the coast, keeping land in sight. Most nights and during bad weather they chose to bring their ships in to protected areas along the coast. Trading trips on the Mediterranean took place almost totally between March and October when weather conditions were best.

For longer voyages that required sailing in the open ocean, they used the stars. They would maintain the right direction by observing the "Phoenician Star" and now known as Polaris or the North Star.



1. Draw a map of the Mediterranean and show where the Phoenicians lived.
2. What did the sailors do in bad weather?

Sea voyages 3
Pacific Polynesians

Polynesian navigators used a whole range of techniques including use of the stars, the movement of ocean currents and wave patterns caused by islands and atolls, the flight of birds, the winds and the weather.

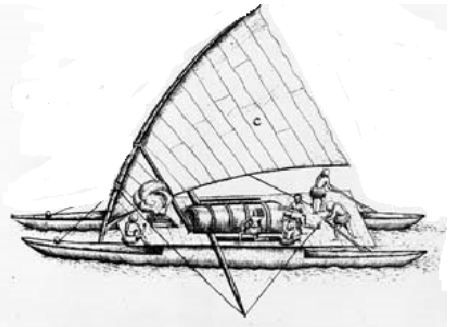
Bird observation

Long-distance Polynesian voyaging followed the seasonal paths of bird migrations. A voyage from Tahiti, the Cook Islands to New Zealand might have followed the migration of the long-tailed cuckoo.

On his first voyage of Pacific exploration, Captain James Cook had the assistance of a Tahitian navigator, Tupaia, who drew a chart of the islands within a 3,000-km radius (to the north and west) of his home island of Ra'iatea. Tupaia had knowledge of 130 islands and named 74 on his chart.

His grandfather and father had passed to Tupaia the knowledge as to the location of the major islands of western Polynesia and the navigation information necessary to voyage to Fiji, Samoa and Tonga.

Draw a Polynesian boat and describe it in words.



Sea voyages 4
European exploration

British, Spanish, Portuguese and Dutch explorers made major discoveries in the 15th – 18th centuries.

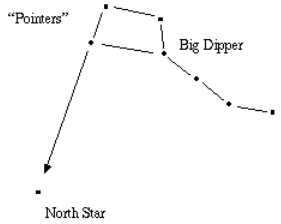
Christopher Columbus (Italian) discovered America in 1492, commissioned by the King of Spain.
Dirk Hartog (Dutch) discovered the West Coast of Australia 1616.
Abel Tasman (Dutch) discovered Australia's Southern island, Tasmania, in 1642.
James Cook (English) discovered the East Coast of Australia 1770.
James Cook discovered South Georgia Island, just to the north of Antarctica in 1774.
Roald Amundsen (Norwegian) was the first to reach the South Pole 1911.

Draw an early European sailing ship and describe it in words.

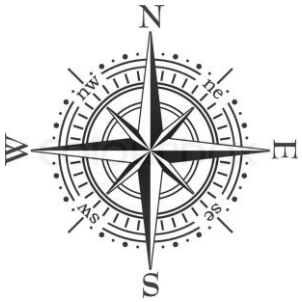
Sea voyages 5
Early methods of navigation

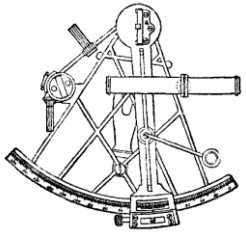
Sailors from many parts of the world used the North Star, also called Polaris, as a sign post in the sky. It is a fixed star and true north can be found directly under this star.

The northern star is always just near the “Saucepan” (Southern Hemisphere), or “Big Dipper (Northern Hemisphere).



European explorers developed instruments to guide them. These were the compass, which always points north, and the sextant which was used to find the angle of the sun or stars above the horizon.





1. Draw the North star and the “Big Dipper”. Where would you find the Big Dipper?
2. Draw the North star and the “Saucepan”. Where would you find the Saucepan?
3. Draw a compass and a sextant and say what they are used for

Sea voyages 6
Mapping

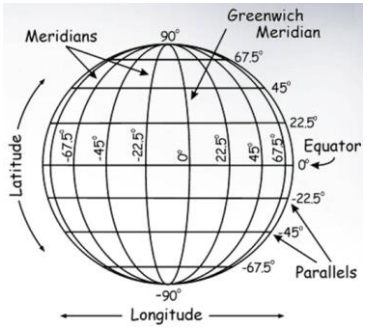
The early Greeks developed a system of showing where you are on a map, by parallel horizontal and vertical lines, which we now call latitude and longitude.

The horizontal lines are lines of latitude. Each degree of latitude is approximately 111 kilometers apart, although there is little variation as the earth is not perfectly round as it is shaped slightly like an egg.

The vertical lines on the globe are known as longitude. They all come together at poles and are widest at equator i.e.at the middle of the earth. Greenwich in England is at zero-degree longitude.

Degrees of longitude and latitude are divided into minutes and seconds. Every degree has 60 minutes and every minute has 60 seconds.

Early explorers could calculate latitude by the position of the sun, but to calculate latitude they needed an accurate clock.



Find out the latitude and longitude of the place you live.

Sea voyages 7
Facts about ships

- Large watercraft are generally called ships.
- Smaller watercraft are generally called boats.
- They are designed to float on water, whether it be in lakes, rivers or seas.
- Boats and ships serve a variety of purposes including transport, recreation, fishing, sporting competition and military operations.
- Some boats are human powered, including kayaks, canoes and gondolas.
- Sailboats are propelled by wind and sails.
- The tall upright post on a sailboat is called a mast.
- Motorboats are propelled by engines.
- Cargo ships carry goods between ports around the world.
- The hull is the main body of a boat or ship.
- Starboard and port are nautical terms which describe the right (starboard) and left (port) sides when facing the front (bow) of a ship or boat.
- The rear part of a ship or boat is called the stern.

1. What is the difference between a ship and a boat?
2. Draw and label some different kinds of boats.
3. Draw a ship and label the parts of the ship.

Sea Voyages 8
How do boats move?

There are a large number of different ways to move the ship through the water:

Oars – the first source of ship propulsion ever developed. They rely on the strength of the person in the boat to pull the boat along, and are normally only seen on smaller boats which are easier to propel. Not great to move a large container ship

Sail – uses the wind to propel a boat through the water. Great when there's wind about. Awful on a bright calm day

Paddle steamers – use large paddle wheels to push a boat through the water.

Propeller – the most common form of ship propulsion today. They can operate on their own or in groups of two or three, and are normally mounted in a fixed position on the ship.

For the ship to move, the propeller needs a source of power, or an engine. This is normally placed in the centre of the ship low down as it can be very heavy. To connect the engine to the propeller, a propeller shaft can be used, providing a physical link.

Draw four different kinds of boats and show how they are propelled. Use words to help you describe each drawing.

Smoking, drugs and alcohol 1
Smoking is a health hazard

Packets of cigarettes sold in most countries of the world have this warning:
Smoking may damage your health
Or
Smoking causes lung cancer

Cigarettes can damage your health in many ways.
Smokers have a greater chance of getting heart disease, lung cancer and diseases that make it hard to breathe.

For someone who smokes, food is not as tasty, they have bad breath, smelly clothes, they get out of breath quickly and they probably have a smoker's cough.

Cigarettes are made from tobacco which contains tar. Yes, the same black stuff that is used to make roads. Tar builds up in the smoker's lungs. That's what causes lung cancer.

They will also spend a lot of money on the habit.

Make a poster about why smoking is bad for you.

Smoking, drugs and alcohol 2
An interview with a smoker

If you know someone who smokes, and is willing to be interviewed, ask:
Why they started smoking
Why they still smoke

1. Make a report on your interview.

2. Imagine you are trying to explain to someone why they should not start smoking. What would you say to them?

Many people start smoking because:
- Someone tells them that it is great
- Someone tells them that everyone else is doing it

But the truth is:
- Smoking makes someone feel uptight, agitated and nervous when the effect wears off.
- More than 89% of young people in Fiji DO NOT smoke.
- Smoking will make a person poor.
- Smoking affects the people around the smoker. People are exposed to passive smoke which can cause the same health problems as the smoker.
- It's hard to quit. It can take as many as 5 or more tries to succeed.
- About 8 out of every 10 young people say that those who smoke are LESS ATTRACTIVE than non-smokers.

3. If someone thinks they need to smoke to "feel good", what could you say to them?

Smoking, drugs and alcohol 3
Marijuana, Cannabis

Cannabis is a “depressant” drug that comes from the cannabis sativa plant. Depressant drugs slow down the nervous system. They slow down the messages going between the brain and the body.

Marijuana made from the dried leaves and flowers of the cannabis plant.

Cannabis has far more tar than tobacco, so has a lot more damaging effects on the lungs.

When a person first uses cannabis:

- They may feel happy and relaxed. They laugh at things that other people don’t find funny.
- They take risks and put themselves and others in danger.
- They have an increased appetite so might snack on junk food.
- They are less coordinated, meaning that they may stumble or make wrong judgements. It is dangerous to drive or operate machinery.
- They cannot concentrate, cannot remember things and lose track of what they are saying.
- Like cigarette smoking, it is addictive. When the body gets used to the drug, it will keep on craving for it.

People who start smoking marijuana may do this because someone tells them to do it. This can happen through hanging around with the wrong crowd.

1. *Why is it important to choose your friends carefully?*
2. *How can drugs affect the whole society?*

Smoking, drugs and alcohol 4
Alcohol

People who drink alcohol to excess are likely to experience a number of physical effects, including:

- Hangovers (a headache after waking up the next day)
- Nausea (feeling sick)
- Shakiness
- Vomiting and memory loss
- Losing balance
- Feeling dizzy
- Injury to yourself
- Alcohol poisoning

Alcohol affects the brain, and can do permanent damage to the brain of people under 18.

Alcohol affects people’s judgement, especially their ability to drive a car. It can make people act in ways they would not normally act.

1. *Many people drink alcohol because they are sad, lonely, or stressed. What is a better way to deal with problems such as these?*

2. *Some people drink alcohol because they just want to join in with the crowd. What is better than being a ‘crowd pleaser’?*

3. *What should a person never do after drinking alcohol?*

Leadership 1
Leaders need a right understanding of truth.

Leaders do what is right, not what is popular.
Leaders need to know what they believe and why, and be able to communicate this with others.
Leaders need to be a model to their team, based on their understanding of truth.

1. A class is given the responsibility of choosing a fundraising activity. The majority of the class want to sell junk food but a few think that this is not a good idea. As class captain, how would you handle this situation?
2. A youth leader chooses not to take the youth group to a showing popular movie that involved bad language. What would his reasons be and how would he explain it to the youth group?
3. List some key parts of the Bible that give us an understanding of truth, and principles to live by.
4. Governments that base their laws on the Ten Commandments have a justice system based on truth.
   a) Write some laws that are based on the Ten Commandments
   b) What would happen if the majority of the society decided they didn't want these laws?

Leadership 2
Leaders need to have a definite goal.

Leaders need to know *why* they want to achieve their goal.
They must check whether motives are right. Is the goal for personal gain or benefit of others?
Leaders need to know the right timing for the different parts of the project to be put into place.
Leaders must be able to explain the goal clearly to the team and inspire the team to work towards the goal. They must work out strategies which involve all team members in reaching the goal, and not just use certain people who have specific talents.

Imagine that you are a leader of a team that is going to clean up your town or city, and prevent littering in the future.

1. Choose a city or town, and decide how big your team will be. Describe the age-range of your team members.
2. How would you explain your goal to your team? Include the 'why'.
3. Make a project plan, outlining the steps you would take over a 6-month period.
4. How will you involve your team members?
5. How will you choose leaders and what will their leadership roles be?

Leadership 3
Leaders need to know themselves.

Leaders need to know their own strengths and engage them.
They need to know their weakness and work on them.

Imagine you are a leader of a team that is going to make a difference to your school. Your whole class is the team and you are the team leader. The project could be:

- To build a school garden
- To raise money for the school
- To fix up broken desks
- To help children who can't read
- Or any project you like

1. Choose your project according to the gifts and talents YOU have.
2. How will you organize your team? Make a plan.
3. What areas of weakness might you need to work on personally to help you be a better leader?

Leadership 4
Leaders need to know and understand their team.

Leaders need to know the strengths of their team members and engage them. Leaders have the responsibility of encouraging the followers to use their gifts (Eph 4:11-12).
Leaders also need to help develop good character in team members.
Leaders need to know the fears, frustrations, dreams and identity needs of their team. These are important and should not be overlooked.
Leaders need to inspire the team and enable them to act. Leaders can do this by being positive and energetic.

Imagine you are leader of a mission trip to an African country where there is war, famine and people are dying due to lack of medical help. Many are living in tents because their homes have been destroyed.

1. What might some of the fears of your team members be? How would you encourage them not to be afraid?
2. How could you prepare your team to be better equipped, before setting off?
3. Outline the different abilities of team members that could be utilized. How would you organize them into smaller teams?

Leadership 5
Leaders need to listen and understand.

Leaders need to have insight into the hearts of others.
They need to be sensitive to people's personalities and respect their concerns. Everyone is different.

1. Make a list of some of the different personality types you might have on a team.
2. As a leader, how would you give advice to someone who was shy and sensitive, if you wanted them to do something differently to how they are doing it?
3. What would you do if someone on your team had a real concern about the way the project is going, and could see that there may be problems down the track?
4. What are the qualities of a good listener?

Leadership 6
Leaders need to take advice from others.

Accountability is being responsible to someone for your actions.
Accountability shows willingness to admit your mistakes.
A leader needs to have a mentor. This is someone who you can learn from because they have walked the road you are walking on now. It is someone you can have regular discussions with.
A mentor in a Christian setting is someone you can pray with, and someone who prays for you.
We can also learn from great leaders in history. Jesus was the greatest of these. We can search the past to make a difference in the future.

1. What is a mentor?
2. If you were a team leader of a sports team, what kind of person would you choose for your mentor?
3. If you were a Sunday School teacher, who would you choose for your mentor? Why would you choose this person?
4. What can we learn from Jesus as a leader?
5. Name another person in history that we can learn leadership skills from. Why was this person a good leader?

Leadership 7
Leaders need to train up new leaders.

If you are a leader, don't try to do all the work yourself, even if you think you can do the job better. Give your team freedom and control to make decisions.

There should be clear roles of leaders and team members. Team members should know who their leaders are and respect them. This is team work.

A leader can choose and train new leaders who can be responsible for different areas of the project. The new leaders can lead smaller teams, each with a specific task. This is called 'delegating' responsibility.

Imagine that your church is running an after-school kid's club program. You have been put in charge. Ten people have volunteered to help run the program.

1. Draw up a survey form for the ten volunteers to find out in what areas they think they could help.
2. Make a list of ten imaginary people and next to their names write their skills that could be useful in running a kid's club.
3. If you have three people who like to do arts and crafts, how would you organize their involvement?
4. What is the meaning of the word 'delegate'?

Leadership 8
Leaders need to encourage their team.

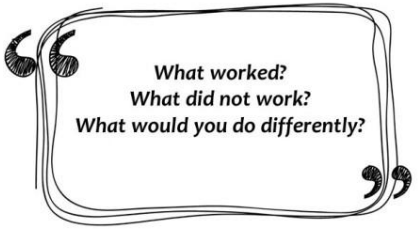
A leader should give the team feedback. Feedback can be positive or negative.

Positive feedback is praise for an effort well done. People like to be thanked for their efforts, and like to be told that they have done a good job. After an event, it is good to have a discussion on how everyone thinks the project went. A leader can encourage discussion.

Sometimes negative feedback might be necessary concerning particular issues. A leader will give information on what needs improvement. The leader should allow the team to give their ideas and opinions on how the direction of the work on the project could have been improved.

Allowing the team to talk about their successes and failure is better than straight out criticism from the leader. This only puts people on the defensive and they won't open up. If things go wrong, it's better to talk to team members and find out *why* things went wrong, rather than just "dumping" criticism on them.

1. You are the director of a dance performance. The performance has been a great success. What will you do to encourage your dance group?
2. You are the captain of a sports team that has lost three games in a row. What will you do?



Leadership 9
A leader has to show humility.

Jesus washed the disciples' feet. He walked on dusty roads from town to town, healing people and helping people. As a leader, He was an example to the disciples and us. He didn't make Himself great, even though He was.

A leader is a servant. The leader aims to reach the goal God's way, as a service to God. He wants to reach the goal by encouraging the gifts, knowledge and skills of the whole team. The goal for the leader is not to make himself look great, but to serve God and others. The leader must be willing to do the lowly jobs, the hard jobs, the jobs that no one notices.

A leader must have the courage to take risks, even if it means he doesn't look good if he fails. He must admit when he is wrong and be open and honest with his team. This is humility.

1. Write out this Bible verse: Matthew 20:26.
2. If you are leading a group of young people on a camping trip, what are some of the serving jobs you might have to do?
3. Why might you have to do some of these jobs?
4. When might a leader have to take a risk?
5. What should a leader do if the project fails?

Leadership 10
A leader must prioritize.

To prioritize means to do the most important things first and the least important things last. It could also men to use most of the money o0n the most important things and less money on the least important things. This is good management.

A leader must look at the big picture and think about which jobs are most important, which jobs should take up the most time, money and energy. A leader should put first things first and not get bogged down in the less important details.

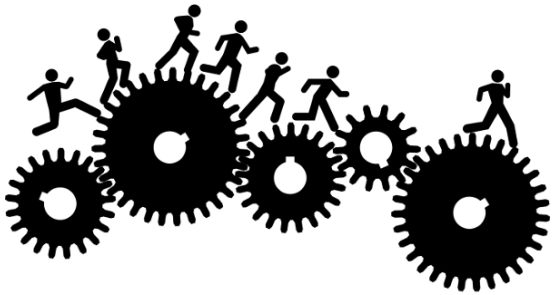
1. If you were prime minister, list 5 areas that you would see as being most important for spending taxpayer's money.
2. Your family is expecting visitors for dinner in half an hour. The house is a mess. There are children's toys on the floor, dishes unwashed, dinner unprepared, the baby is crying and your three-year old has tipped out the cat food and is eating it. Mum has asked you to take care of everything except for the dinner which she is about to cook. There is only you and your sister to do the work. Make a list of the jobs, starting from the most important to the least important, and who will do them.

Leadership 11
Attributes of a good leader

- Modeling (by example)
- Instructing
- Encouraging
- Evaluating
- Developing gifts of team members
- Humility

1. List these attributes. After each one, explain how a good leader would put the attributes into practice.

2. Read Phil 2:5-11. What does this tell us about the leadership of Jesus?



Leadership 12
Seven things a leader should not do

- Dominate
- Put others down
- Threaten *("if you don't do this I will…")*
- Avoid an issue that needs discussion
- Compete with others
- Treat people like objects
- Show favouritism

1. Make a list of the seven. After each one, explain why a good leader would not do these things.
2. Name a leader in history that practiced these things and brought about disaster. What were the consequences?