

# The Human Body: Outcomes and activities

## God is Wise Year 6

### Spiritual overview

We are created in God's image. Each person is special to God. We are wonderfully made, a masterpiece of his handiwork. God wants us to accept ourselves as he made us and see ourselves as he does. We must thank God for the gifts he has given us and use those gifts to serve him. God wants us to keep our minds pure by living according to the instructions in the Bible. We can also keep our bodies pure by maintaining optimal health through healthy food and exercise habits.

God has created our bodies with built-in protective mechanisms. The body systems that offer protection are the circulatory system, the immune system and the skeletal system. Faith in the shed blood of Jesus protects the Christian from all spiritual adversaries. Blood is a powerful symbol of life and protection. Blood serves a number of functions in the human body. One of its principal roles is protection. God has designed our body with an incredible capacity for self-healing, given the right care.

### Values: Our response to 'God is Wise'

- Making **wise** choices
- **Integrity**: always doing the right thing; showing the Fruit of the Spirit in our lives
- **Respect** for what is right
- Showing **obedience** to God by doing the things He wants us to do.
- **Thankfulness** to God for the way we are made.

### Bible references

Genesis chapters 1 - 3 The creation and fall.

Matthew 10:29-30 God knows the number of hairs on our head.

Psalms 139 We are wonderfully made.

Genesis 1 God created us.

Genesis 1:26 Then God said, "Let us make man in our image, in our likeness."

Genesis 3 Sin entered the world, (the reason for sickness and disease).

Deuteronomy 7:12,15; Exodus 15:26 If you pay attention to my commands I will put none of these diseases upon you. I am the Lord who heals you.

Leviticus 22:4 - 8 Ceremonial health laws concerning infectious skin disease, touching a dead body, eating of meat torn by wild animals. These laws were given for the protection of the Jews, long before other cultures knew that disease was passed on by germs, carried by blood, and transferred from animal to man.

Ephesians 2:10 For we are God's workmanship, created in Christ Jesus to do good works, which God prepared in advance for us to do.

Acts 17:28 (a) For in Him we live and move and have our being.

1 Corinthians 6:19-20 Don't you know that your body is the temple of the Holy Spirit, who lives in you and was given to you by God?

Romans 12:1 Offer yourself as a living sacrifice to God, dedicated to His service and pleasing to Him.

Luke 10:27 Jesus said, "You shall love the Lord your God with all your heart, and with all your soul, and with all your strength, and with all your mind; and your neighbour as yourself." (Note that we are expected to 'love' ourselves, meaning 'look after ourselves'.

### Outcomes: Students will

Gain a knowledge of the following body systems:

- a) Systems with protective role: the circulatory system, the muscular-skeletal systems
- b) Systems with elimination roles: digestive, respiratory and urinary systems

## Activities

### Discussion 1: Caring for the body

What do we mean by a body 'system'?

Different parts work together to make a system, and the systems work together to keep the body functioning. Relate this to Romans 12:12-27.

What does it mean to be valued?

What does God say about the value of each individual?

How do we keep our minds pure?

How do we obey God in caring for our bodies?

### Discussion 2: Protective role of the body

How does our body protect itself?

How important is blood to life?

What examples of the shedding of blood can we find in the Old Testament?

How was this a symbol of what was to come?

Why do you think God chose blood as a symbol of protection from evil?

### Circulatory system:

- Research the circulatory system.
- Draw the heart and show the direction of blood flow. Use red for arteries and blue for veins.
- Describe and draw different types of blood cells.
- Report on blood types if known.
- Research the functions fulfilled by the blood: transport of food, waste, oxygen, hormones and chemical messengers; anti-bacterial action of white blood cells, clotting capacity to prevent bleeding and temperature control.
- Use a microscope to identify different blood cells. (Prick finger and examine blood smear.)
- Participate in exercise for the cardiovascular system.
- Take pulse rate before and after exercise.
- Compare pulse rates of students in the class. Draw a graph to show pulse rates.

### Skeletal system:

- Take a brief look at the skeletal system, and its role in protecting vital organs.
- Discuss food for bone building, (including vegetables).
- Draw the skeleton and label the major bones.
- Make a cut-out of a human skeleton and join the pieces together with needle and cotton so that the skeleton can move at the joints.
- Study a copy of an x-ray.
- Participate in weight-bearing exercises.
- Experiment with different body positions and discover parts that give support.
- Discover and discuss good posture when standing, sitting and walking.
- Research the way that muscles work in pairs.
- Research the role of joints.
- Art – making a model of the human skeleton

### Digestive system:

- Draw the digestive system and label body parts: mouth, esophagus, stomach, small intestine, large intestine, anus
- Make a cut-out of the parts of the digestive tract and join them together like a jig-saw puzzle.
- List foods that help or hinder digestion (refined white products compared with food containing fiber).

- Explain what happens to a mouthful of food as it makes its way through the digestive system.
- Define respiration. (The use of oxygen, to produce energy and carbon dioxide).
- Art – make cut-out model of digestive tract.

#### **Respiratory system:**

- Draw the respiratory system and label body parts: diaphragm, lungs, nose, trachea, bronchi, bronchioles, alveoli.
- Observe chest expansion and contraction when breathing.
- Measure own breathing rate and breathing rate of other students. Calculate the average breathing rate in breaths per minute.
- Discover whether there is any relationship between pulse rate and breathing. (Measure both pulse rate and breathing rate before and after exercise).
- Measure how long they can blow through a straw into water after breathing in.
- Observe water vapor content of breath. Explain how the air we breathe in collects water vapor.
- Blow up a balloon to illustrate the alveoli.
- Discuss the problems faced by people with asthma.
- Maths – Measure breathing rates of class members and record in graph form.

#### **Urinary system:**

- Draw the urinary system and label body parts: kidneys, ureters, urethra
- Discuss the importance of drinking water, and the damage that dehydration can do to the kidneys.

#### **Reproductive system:**

- Draw the male and female reproductive systems and label body parts: uterus, vagina, ovaries, uterine tubes, mammary glands; scrotum, penis, testes, prostate gland.
- Explain the role of hormones.
- Discuss the dangers of man-made chemicals in upsetting the balance of hormones, (e.g. plastics, pesticides)

#### **Interesting facts:**

##### **Medical treatment and blood**

The medical knowledge that is available throughout the world today has not always been known. In Europe and America, up until about 200 years ago, there were some very strange ideas about the human body. One of these strange and harmful practices was called “blood letting”. Because people thought that diseases started in the blood, they thought that if you got rid of some blood it would help you get well again. So they would cut a vein and drain blood from the patient.

In December 1799, George Washington, then the president of the USA, became very ill. His doctors bled him four times in one day. In a few hours he was dead.

The practice of bleeding patients was also carried out in other parts of the world by folk healers. But doctors today know that bleeding does not help a sick person. It does just the opposite. That’s because the blood carries to every part of our body the things we need to stay alive. Removing the blood makes it harder for the blood that’s left in the body to do its job.

This information has been in the Bible for thousands of years. Leviticus 17:11 says, “The life is in the blood.” Isn’t it sad that in George Washington’s time people didn’t realize that this verse is true?

What the Bible tells us about blood is evidence that it is the Word of God, since no one else knew at the time the Bible was written.

**NEW START stands for:**

- **Nutrients** – are the parts of food that makes us grow, and stay healthy. Only healthy foods do this.
- **Exercise** – at least half an hour every day
- **Water** – 6 glasses a day, (not fruit juice or fizzy drink)
- **Sunlight** – for vitamin D for strong bones.
- **Toxin-free** – avoid artificial food additives and avoid toxic chemicals in the environment
- **Air** – get fresh air every day
- **Rest** – don't stay up late
- **Think happy thoughts and trust in God**

**Some definitions**

**Natural food:** Also called 'unprocessed food'. These are foods directly from nature, such as fruit, vegetables, nuts, meat, fish and eggs. Some dried or tinned foods can be classified as natural foods if they do not have food additives, e.g. dried beans, lentils, rice, butter, milk, tinned tomatoes.

**Fast food:** Convenience food from outlets. Ready-to-eat foods such as hamburgers, hot dogs, fried chicken and chips. These have some nutritional value but contain ingredients that are not good for our health. Should be eaten rarely.

**Food additives:** Chemicals added to give artificial colour or flavour, or to preserve the food.

**Processed food:** These are foods that are changed from their natural state and sold in packets, cartons and cans. Some have nutritional value. Some have additives. Food labels should be checked and assessed for health benefits.

**Junk food:** food with no nutritional value and food that may be bad for our health. These include sweets, sugary foods, savoury snacks such as potato crisps, and soft drinks or imitation fruit drinks. Should be consumed rarely.

# Values education

## God is Wise Year 6

### Responsibility

#### Responsibility is...

- Being willing to be accountable for your behavior
- Acting in a mature way
- Being in charge of a person, a group of people, or material things

Being responsible is a sign of maturity. Parenting requires a great amount of responsibility. A baby depends on its parents to care for it in a responsible way. To be away from the baby, the parents will have to organize a baby sitter.

#### A responsible person...

- does whatever they agree to do. They follow through on their commitments.
- answers for their own actions. They don't make excuses or blame others for what they do. They accept their responsibility of being in charge.
- takes care of their own matters. They don't rely on others to remind them when they are supposed to be somewhere or what they are supposed to bring.
- is trustworthy. If somebody lends them something, that person knows it will be taken care of, and returned.
- makes good judgments, wise decisions and wise choices.
- doesn't put things off. When they have a job to do, they do it.

#### Activities

1. Make a list of jobs a responsible parent has to do when caring for their baby.
2. Make a list of responsibilities YOU have in your life at the moment.
3. Make a list of things you could improve on to become a more responsible person.

### Righteousness (Living in a righteous way)

What does Righteous mean?

Write down the definition of righteous.

What does it mean to be a righteous person?

When did you act in a righteous way?

When did you act in an unrighteous way?

Why did you act in this unrighteous way?

Write down the verse 1 John 3:7 from your Bible.

What is God encouraging us to do?

Why do you think God wants us to be righteous?

# Art Year 6

## God is Pure and Holy

### The human body

**Biblical wall text:** Don't you realize that your body is the temple of the Holy Spirit, who lives in you and was given to you by God? You do not belong to yourself. 1 Corinthians 6:19

#### Art history

Why did the Ancient Greeks produce so many art works of sculpture representing the human body?

This was the beginning of a religion called 'humanism' which concentrates on the importance of human effort above everything else, and even above God. However, there was a great division between rich and poor. The rich ruled over the poor, who had no rights and many were treated as slaves. Humanism ignores the God of the Bible and puts the ideas of people above God.

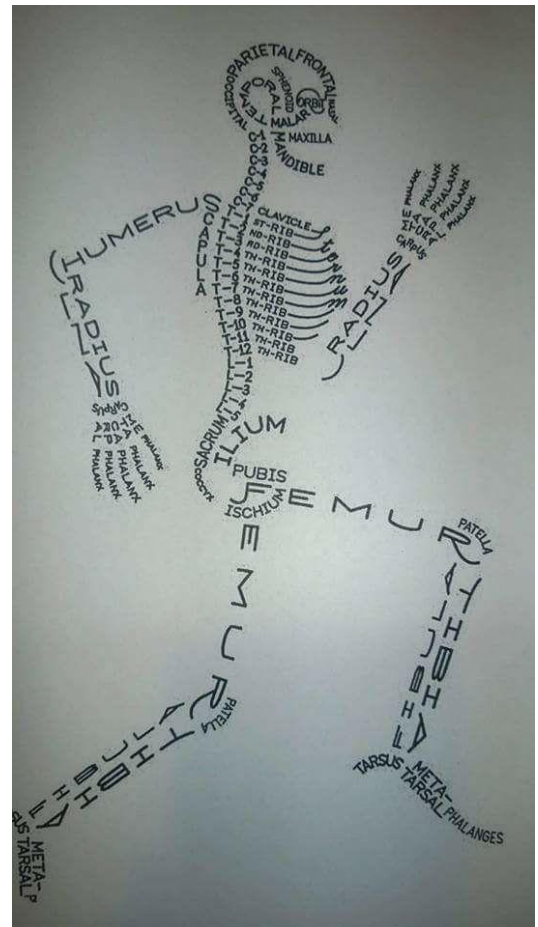
Do we see 'Humanism' at work in the world today?

**Posters** – to promote health and fitness

**Example:** Draw pictures to illustrate ideas

#### Benefits of Exercise

- Builds strength – stronger muscles and bones
- Coordination
- Confidence
- Healthy lifestyle
- Teamwork
- Meeting challenges
- Sportsmanship
- Commitment
- Fitness
- Flexibility



# Practical Science: God is Wise Year 6

## Topic: Human Biology

### Test Your Dominant Side

<http://www.sciencekids.co.nz/experiments/dominantside.html>

This experiment will teach you more about how your body and brain work together. Test your dominant side by completing a series of challenges. Which hand do you write with? Which foot do you kick with? Do you have a dominant eye? Do you throw with one side of your body but kick with the other? Are you ambidextrous?

#### What you'll need:

- A pen or pencil
- Paper or a notepad to write your findings on
- An empty tube (an old paper towel tube is good)
- A cup of water
- A small ball (or something soft you can throw)

#### Instructions:

1. Write 'left' or 'right' next to each task depending on what side you used/favored.
2. When you've finished all the challenges review your results and make your own conclusions about which is your dominant eye, hand and foot.

#### Eye tests:

1. Which eye do you use to wink?
2. Which eye do you use to look through the empty tube?
3. Extend your arms in front of your body. Make a triangle shape using your fore fingers and thumbs. Bring your hands together, making the triangle smaller (about the size of a coin is good). Find a small object in the room and focus on it through the hole in your hands (using both eyes). Try closing just your left eye and then just your right, if your view of the object changed when you closed your left eye mark down 'left', if it changed when you closed your right eye mark down 'right'.

#### Hand/Arm tests:

1. Which hand do you use to write?
2. Pick up the cup of water, which hand did you use?
3. Throw the ball, which arm did you use?

#### Foot/Leg tests:

1. Run forward and jump off one leg, which did you jump off?
2. Drop the ball on the ground and kick it, which foot did you use?

### **What's happening?**

What side do you favor? Are you left-handed or right-handed? Left footed or right footed? Is your right eye dominant or is it your left?

Around 90% of the world's population is right-handed. Why most people favor the right side is not completely understood by scientists. Some think that the reason is related to which side of your brain you use for language. The right side of your body is controlled by the left side of your brain, and in around 90% of people the left side of the brain also controls language.

Others think the reason might have more to do with culture. The word 'right' is associated being correct and doing the right thing while the word 'left' originally meant 'weak'. Favoring the right hand may have become a social development as more children were taught important skills by right-handed people and various tools were designed to be used with the right hand.

Around 80% of people are right footed and 70% favor their right eye. These percentages are lower than those who are right-handed and this could be because your body has more freedom of choice in choosing its favored foot and eye than that of its favored hand. In other words, you are more likely to be trained to use your right hand than your right foot and even more so than your right eye.

It's not strange to find people who favor the opposite hand and foot (e.g. left hand and right foot), and some people are lucky enough to be ambidextrous, meaning they can use their left and right sides with equal skill.

Try testing others and coming to your own conclusions about what side the human body favors and why.

Extra: Are you more likely to be left-handed if one of your parents is left-handed? What are some of the possible disadvantages for left-handed people? (Tools, writing materials etc.) Do left-handed people have an advantage in sports?

Is it better to be left-handed in some sports than others? What do you think?



# Practical Science: Human Biology

## Take your pulse rate

### What you need:

A watch that shows seconds

### What to do:

1. To find your pulse, put the three middle fingers of one hand inside your other wrist.
2. Rest your fingertips against the thumb side of your wrist. You will feel a regular throbbing under your fingers.
3. Sit in a chair resting for about 5 minutes. Now count the beats in your wrist for one minute. (A pulse rate should be between 90 and 120 beats per minute for children and around 70 beats per minute for an adult.)
4. Try running or skipping for a couple of minutes and then take your pulse rate. What has happened?

**Thinking Skills**

<p><b>The human body 1</b> Write an acrostic poem for: <b>S K E L E T O N</b></p>	<p><b>The human body 2</b></p> <p>Design a piece of playground equipment that will strengthen the leg muscles.</p>
<p><b>The human body 3</b></p> <p>Design a new and different piece of equipment that will help a person who has lost the use of their legs.</p>	<p><b>The human body 4</b></p> <p>Invent a new and different type of exercise machine.</p>
<p><b>The human body 5</b></p> <p>The answer is: <b>“God created people in His image.”</b></p> <p>Work out 5 questions.</p>	<p><b>The human body 6</b></p> <p><b>Humans are more special to God than animals.</b></p> <p>Justify this statement.</p>

**Thinking Skills**

<p><b>The human body 6</b></p> <p>Draw an exercise bike. Now, redesign I by using the following steps:</p> <p><b>B</b> – igger <b>I</b> – instead of <b>N</b> – onsense <b>G</b> – et rid of <b>O</b> – ther uses</p>	<p><b>The human body 7</b></p> <p>Create a new product for fitness by combining:</p> <p>a ball and a skipping rope</p>
<p><b>The human body 9</b></p> <p>The answer is</p> <p><b>“fitness”.</b></p> <p>Give 5 interesting questions.</p>	<p><b>The human body 10</b></p> <p>Brainstorm 5 solutions for this problem:</p> <p><b>Too many injuries are caused in sport.</b></p>
<p><b>The human body 11</b></p> <p>Design a solar powered piece of exercise equipment.</p>	<p><b>The human body 12</b></p> <p>Predict how people with hearing loss will be helped 50 years from now.</p>

# 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?

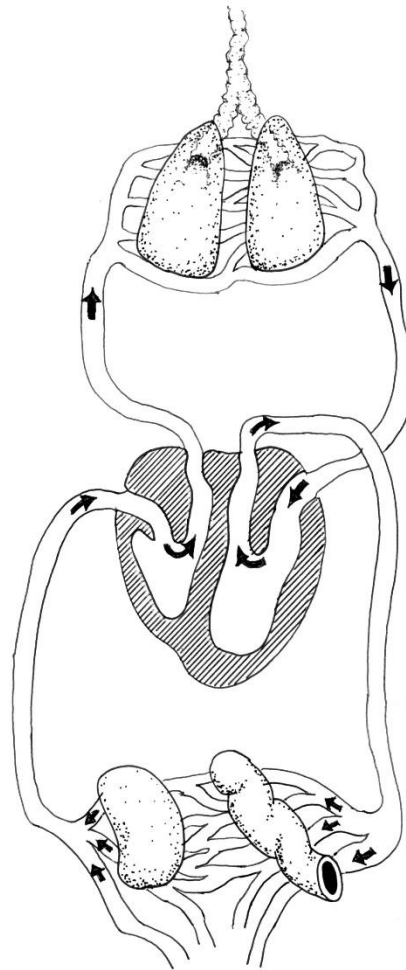
### The Human Body 3

#### 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  
This is blood that has  
from the lungs. It is taking  
the body, to the cells.



on the right, in red.  
received oxygen  
the oxygen around

## 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.

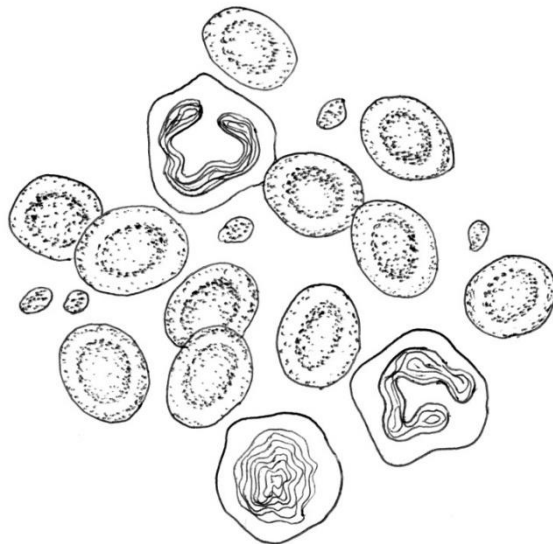
There are many more red blood cells than white blood cells. The blood is a transport system. It transports oxygen and nutrients to the body cells so that the body can live and have energy. It carries the waste products back for filtering out through the kidneys and liver. It takes water to our cells, 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 products 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:

- **Nutrition** – eat healthy food
- **Exercise** – at least half an hour every day
- **Water** – 6 glasses a day, (not fruit juice or fizzy drink)
- **Sunlight** – for vitamin D. Keep sun exposure to 10 minutes at a time, in the cooler parts of the day
- **Toxin-free** – avoid food additives and avoid toxic chemicals in the environment
- **Air** – get fresh air every day
- **Rest** – don't stay up late
- **Think 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.

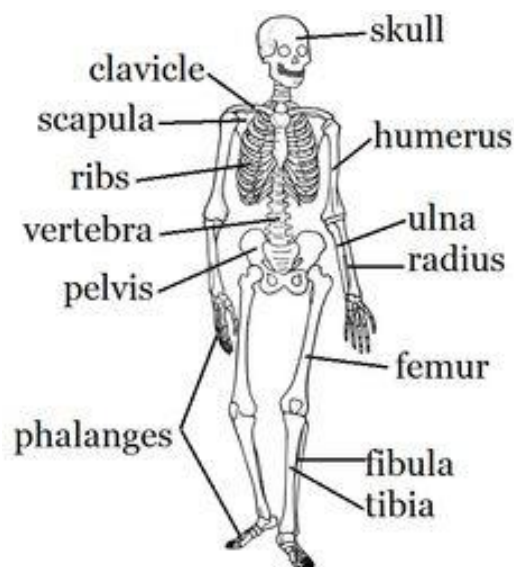
The skeleton is made of bones, which are the hardest material in the human body. Yet our bones are living tissue in which red and white blood cells are made, and also a storage site for calcium. Bones have the ability to grow and repair themselves if they are fractured or broken. Although bone is the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



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)	Clavicle
Upper arm bone	Pelvis
Lower arm bone (inner)	Ulna
Toes	Radius
Lower arm bone (outer)	Phalanges

## The Human Body 10

### 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.

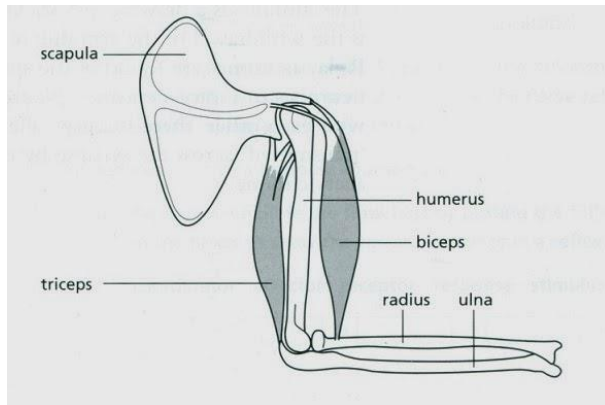
Good forms of weight-bearing exercise are: riding a bike uphill, walking uphill, climbing, lifting weights and swimming.

What can you do for good bone health?

## The Human Body 11

### 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 12

### 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.

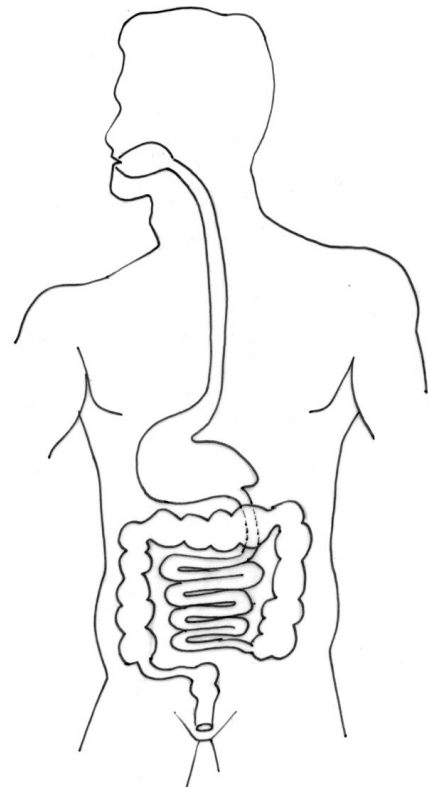
Carbohydrates are in foods like potatoes, rice, pasta, bread and sugars.

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**.

### Draw the digestive system

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



## The Human Body 13

### 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)

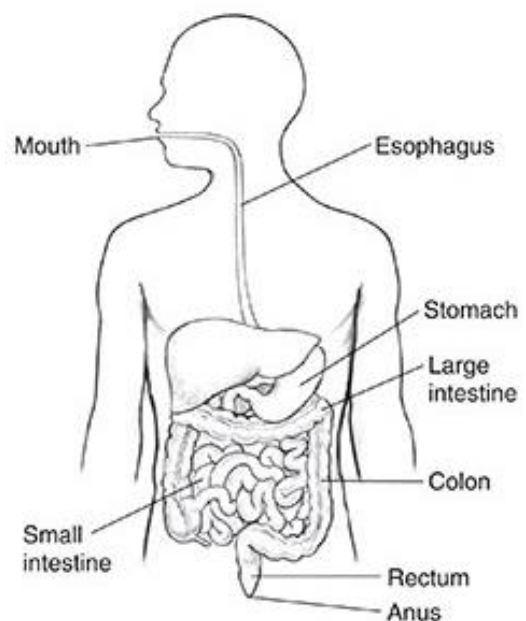
Digestion begins in the \_\_\_\_\_. Food travels down the \_\_\_\_\_ and arrives in the \_\_\_\_\_. The food is mixed with digestive \_\_\_\_\_ and gets broken down into \_\_\_\_\_. The liquid passes into the \_\_\_\_\_ and then the tiny particles get absorbed into the \_\_\_\_\_. The blood takes the 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 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.

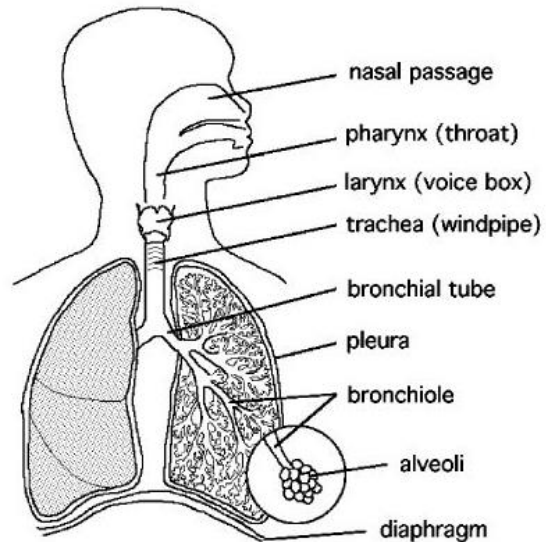


## The Human Body 14

### 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



#### Respiratory system: The lungs

Our lungs are organs in the chest. Lungs are with air and emptied by the up and down movements. 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 15

### 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.**

### 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 16

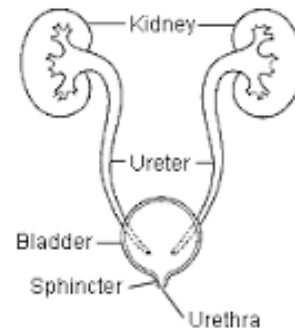
### The urinary system

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 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 17

### 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?

### 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 \_\_\_\_\_.

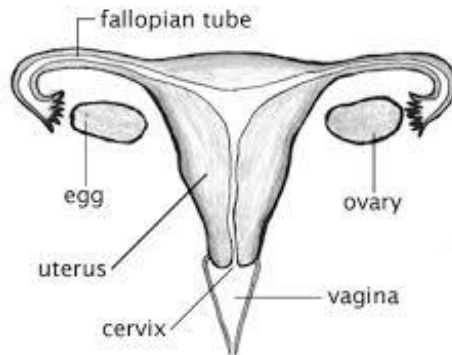
When we are dehydrated our body systems do not \_\_\_\_\_ properly. We should drink \_\_\_\_\_ glasses of water per day. Fizzy drinks, are not good sources of water because they take water \_\_\_\_\_ of the body at the same time as putting it in.

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

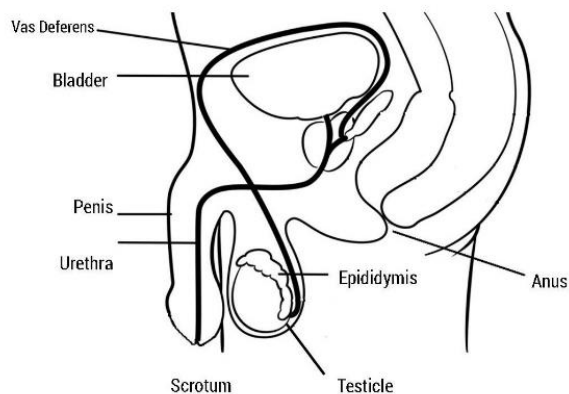
## The Human Body 18

### 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 19**

### **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 \_\_\_\_\_ .

# Smoking, drugs and alcohol

## Student activities

### Introduction

Toxins are substances that are bad for our health. One way to look after ourselves is not to put into our bodies things that make our bodies sick. What are some these things?

Our bodies are the temple of the Holy Spirit.

If God lives in our bodies, how should we treat our bodies?

### Cigarettes

If you are a Christian and smoke, think about how Jesus would feel about living inside you with a cigarette.

Why do people smoke? How do people begin smoking? Here are some reasons:

- to impress a crowd
- to please a friend
- to feel 'in with the crowd'
- because they are tense and worried

Reasons why we shouldn't smoke:

1. A Christian finds joy and fulfillment in a life through Christ. There is therefore no need to smoke for an extra experience.
2. Smoking is a dangerous habit. Many toxins in cigarette smoke are unquestionably related to dangerous diseases, including heart and lung diseases as well as cancer. Our bodies don't belong to ourselves but to God. (We are bought with a price.)
3. It is an unfair habit. It forces all others who share a space with a smoker, to inhale the same fumes, or even secondhand stale smoke.
4. It is a filthy habit. The burnt paper and tobacco leave ash and burned remains. The smoke stains the teeth, makes the breath foul smelling, stains the fingers, pollutes the air and makes clothing smell foul. The ashes and butts pile up as an unsightly mess.
5. It is a waste of time, money and health. That is, a waste of God's time, God's money and the health of a body that belongs to God.
6. It is a gateway into other harmful habits. In most societies, alcohol and gambling go together with cigarette smoking. Cigarette smoking can also lead into smoking marijuana, which can lead into taking other drugs.
7. Cigarette smoking is highly addictive. The nicotine in cigarettes is an addictive drug. Once you've started, and realize that it's not as much fun as you thought, and want to stop, it is very hard. To stop smoking, you will suffer from withdrawal. The lack of nicotine in your body will cause: nervousness, anxiety, headache, nausea, constipation or diarrhea, tiredness, drowsiness, inability to sleep, irritability, difficulty concentrating, and a depressed mood.

## **Recreational drugs**

There are two types of drugs: pharmaceutical drugs (drugs prescribed by the doctor), and recreational drugs. What is the difference between these?

People have used plants and chemicals for thousands of years to change their feelings or thoughts. Since the 1960's, people all over the world have turned to drugs to try and find answers to their problems, with terrible results. Thousands die from bad chemicals or overdoses or accidental death.

Drugs affect the mind, causing 'uppers' and 'downers'. While experiencing an 'upper', the user may experience colours, lights, and everything beautiful. The person sees himself (or herself) as someone strong and beautiful, and life is beautiful. But many hours later, he comes 'down'. The shock hits him; life is not so beautiful any more. The drug experience was just an empty vision, and now he sees himself as he really is. It was all in his mind.

The colours and scenes come from chemicals. Your world is only pretty when your mind is a slave to a drug. When it wears off, there's the same old world and the same old problems. You are still the same person as before, and probably even worse off. Now it will take a bigger dose of drugs than before to get the same experience again. Nothing is different; your guilt, your loneliness and emptiness are still there waiting for you.

How different it is with Jesus! When we see ourselves through Christ's eyes we know that we are loved and precious. We have someone to share our burdens. The world is no longer empty or meaningless. God's joy is direct, immediate and real. His love is not subject to 'ups' and 'downs'. It is always there, and always the same.

## **Alcohol**

Alcohol is actually a type of drug and has the same effects on the mind as recreational drugs. It causes uppers and downers. It may be less dangerous in moderation, but in excess can be just as dangerous.

Some of the immediate effects of alcohol may include feeling more confident, feeling sleepy, losing balance or feeling dizzy.

If you drink to excess you're likely to experience a number of physical effects, including:

- Hangovers
- Nausea
- Shakiness
- Vomiting and memory loss
- Injury to yourself
- Alcohol poisoning

Alcohol is a major cause of injury and death among young people. When you're drunk, you're more likely to put yourself in risky situations, like getting into a car with a driver who has been drinking, or being the perpetrator or victim of violence.

Continuous heavy drinking over a long period of time can lead to:

- Physical and psychological dependence on alcohol
- Significant damage to the brain and liver
- Risk of cancer of the mouth, throat or oesophagus
- Possible increased risk of neurological disorders, heart problems, and sexual problems (especially male impotency)
- Emotional and mental health problems developing, such as depression and anxiety
- Problems at school, work and with relationships

It is not uncommon for young people to experiment with alcohol. The younger a person is when they start drinking alcohol, the more harm they will potentially do to themselves. Alcohol is a toxin, and even when consumed in small amounts, it can be harmful to the still-developing brain and body of a young person.

There are differing views among Christians about whether a Christian should abstain from alcohol completely or whether an occasional drink is acceptable in social situations. Something to think about is this: Having more than one glass of alcohol at any one time may provide a doorway to an addiction, which will have very negative effects on the body. It is also important that Christians do not look to drink as a means of making them forget their problems. We can bring all our problems to Jesus and put our trust in Him completely to sort out our life, whatever situation we find ourselves in. Certain church denominations, such as Methodist, Baptist, and Salvation Army ask their members not to drink alcohol at all.

### **How to say 'no'**

How do you refuse to take part in an activity without putting down the person who asks you?

1. Most times you can simply smile and refuse without going deeper into it. If you are offered a cigarette, drugs or alcohol, simply say, "No thanks, I don't smoke", or "no thanks, I don't drink or "no thanks, I don't use drugs."
2. If asked why not, you can just give them your short testimony for the Lord. Just say, "Well to tell you the truth, I'm a follower of Jesus and He owns my body."

### **References:**

Pratney, W. Doorways to Discipleship

<http://www.tuneinnotout.com/topics/alcohol-other-drugs/alcohol/>