

The Human Body: Teacher's topic guide

God is Pure and Holy Year 8

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 principle 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 Pure and Holy'

- **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; admitting when we make mistakes and asking for God's forgiveness.
- **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.
- Watch a DVD showing the dangers of smoking, and what it does to the lungs.
- 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.

Beacon Media research cards: The human body

Thinking skills: The human body

Biography: Lolohea Akosita

A Christian response to fitness and the body

Throughout history there have been varied philosophies concerning the body. The *Gnostics*, who lived when Jesus was on earth, believed that all things material were evil. They believed that the body was evil and that only the spirit was good. A contrasting philosophy is *Narcissism*, the basis of today's most commonly held attitudes towards body image. This is a "look at me" philosophy, giving way to self-importance, egotism, vanity and conceit. It tells us that a beautiful body is most important to our identity and we are expected to invest in fad diets and all manner of fashion attire, not to mention 'looking good' on social networking. What does the Bible say about body image and looking after our bodies?

Your body

Your body carries about your spirit. The Bible calls it your "temple" out of which you worship and serve God.

"Do you know that your body is the temple of the Holy Spirit?" (1 Corinthians 6:19)

If your body is in optimal condition, then the capacity for servicing God and others is heightened. So should you be aiming to keep your body in good shape? Think about how useful a fit and healthy person can be to God. When you are tired, sick, or a potential health disaster waiting to happen, you may be of less use to God. Although it is a ministry of the church to care and pray for the sick, the fewer sick people there are within the church, the more time Christians have to help those who do not know Jesus.

You must however be careful to check your motives for maintaining an optimal standard of fitness, health and beauty. Are you looking after your body out of obedience to God? Do you want to be fit to serve Him? Or is your motive to build a good physique to impress? Can an old and wrinkled lady be of use in God's kingdom? Of course! She certainly won't be lost to the temptations of vanity and pride in her striking looks and fashionable clothes.

Our bodies are not ornaments, but instruments to bless the purposes and heart of God. If we neglect nutrition and fitness, we may find that we have too little energy to serve well. As life progresses, we may also find that we have to spend money and time on medicine and doctors trying to keep up life momentum as a consequence.

"My body is not my own, I was bought at a price" (1 Cor 6:20). This implies that every Christian is obligated to practice a wise stewardship of the body, which is a gift from God.

Your culture and its impact on your body

Do you then take part in *Christian yoga* exercise classes, or *Pole dancing for Christians* so you can please your spouse, wear tattoos or draw attention to yourself with radical body piercing? The church so often follows the fads of the culture and puts a Christian image on them. Does that mean that these practices are right for a Christian?

Yoga is a practice of Hinduism and carries with it a spirit that is opposed to Christianity. The question of how we dress can be answered when we draw close to God and listen to His

voice on how we should dress and present ourselves. You might say, "I'm not hurting anyone," when you indulge in practices seen as being traditionally unorthodox for believers. This is the world's standard for legitimizing all manner of unwholesome behaviour. The Bible tells us that your body exists as a temple of the Holy Spirit and also as an instrument for blessing, serving and edifying others. Your body has intrinsic value and dignity as it is a creation of God. In some countries, such as Iran and India, there is illicit and growing trade of selling organs such as kidneys. This is different to being an organ donor, because the people donating their kidneys are still living! This practice shows a mindset that the body is just a mechanism not much different to a machine, and vital organs are just items for sale.

We are made in God's image, so in our bodies we see God made visible. "God is love", (*1 Jn 4:8*). We are designed to share in that love. God created us male and female so that we could reflect His love by giving ourselves as a gift to each other. God's purpose for marriage is to bring children into the world, to care for and nurture them in the context of the family. For those who do not have children, their role is to be equally as vital. They are to become spiritual mothers and fathers. This means the woman is nurturing the spiritual, moral, emotional, cultural and at times physical lives of those God gives her to care for. The man responds too in a mentor and father-like way as did Paul of Tarsus. "I have no greater joy than this, to hear of my children walking in the truth", (*3 Jn 1:4*).

The western world thinks highly of a busy executive with a full diary working at a frantic pace. The Bible presents the greatest executive ever, Jesus. When He lived on earth, Jesus was a person who was not afraid to admit being tired and who took a Sabbath rest. Your body was made to respond to rhythms of sleep, rest and recreation in order to function at its fullest. This means taking a rest from electronic communication media as well!

Junk in junk out

What you put into your body, and what you refrain from putting into your body, affects your ability to glorify God. Toxic substances and junk food inhibit thinking and performance levels, as does lack of regular aerobic exercise. Inflicting extreme bodily deprivation also depletes the ability of the body to serve and to think and perceive well. Paul writes to Timothy to warn him of those false teachers who forbid marriage and require abstinence from foods that God required to be received with thanksgiving by those who believe and know the truth, (*1 Tim 4:2-3*). These false teachers were the Gnostics: "men who forbid marriage and advocate abstaining from foods, which God has created to be gratefully shared in by those who believe and know the truth."

While the motto, "all things in moderation" is generally good advice, we should beware of applying it to things that are toxic. Smoking for example, is not good, even in moderation. When it comes to things that are toxic, abstinence is the better way to go. And the difficulty with eating junk food in moderation is that there is no measuring stick. How much is too much? Is it once a day or once a week? We can make our own standard to appease our conscience. 'Hardly ever' for some people might be once a week. For some it might be once a day. Rather than saying "all things in moderation", it is better to say, "some things in moderation and some things never."

What makes a body beautiful or attractive? Movie stars, pop stars and TV advertisements present us with images that are considered to be a beautiful/attractive male and female body. Who sets the standard? Since 1959 millions of young women have aspired to look like the Barbie doll, whose body shape is idealistic and unreal. People crave what is real, and if you with your limitations are loved by God and actively serve Him, the unsaved will recognise this. They will realise that they can be loved and *are* loved, by God too. Salvation is not dependent on an ideal body or youthfulness.

Gender bender

The rise of the homosexual movement is causing a rethinking of the notion of gender. Rather than gender being something defined by anatomy, they would argue it is a social product and not a fixed thing. But gender is not a preference. Christians would say that the structure of a man and a woman's body speaks of connection. We are wired to want union, intimacy, love and sex, friends and children. This is part of our God-like image. God uses the analogy of marriage union as a teaching metaphor of the divine joining of ourselves, (the bride), with the husband, (Jesus).

"And God created man in His own image, in the image of God He created him; male and female." (*Gen 1:27*)

An eye to the body beautiful

Sex and the sex drive (or desire) is part of our created body. In Genesis 1 and 2 we read that we humans are created male and female and together given the command to procreate and fill the earth. We need sexual desire. God made it powerful for a purpose...to produce offspring. God ordained marriage as the place for sexual intimacy.

Sexual desire is the natural attraction to the opposite sex. But genuine love must include the higher, nobler aspects of love—such as good will, friendship, virtue, or self-giving commitment. When sensuality *only* is stirred, we experience the body of the other person as a potential object of enjoyment. We reduce the person to their physical qualities—their good looks, their body. And we view the person primarily in terms of the pleasure we can experience from those qualities.

"Beloved, I urge you...to abstain from fleshly lusts which wage war against the soul" (*1 Pet 2:11*).

Lust dehumanizes the target person. What God requires is unconditional love of the whole person. Lust fails to see the human body as a beautiful masterpiece of God's creation, for it reduces the body to being an object to be exploited, to satisfy one's own cravings in a consumer attitude.

..."the very God of peace sanctify you wholly; and I pray God your whole spirit and soul and **body** be preserved blameless unto the coming of our Lord Jesus Christ."
(*1 Thessalonians 5:23 KJV*)

Activities

1. Explain “Gnosticism” and why the philosophy was opposed by orthodox Christians
2. What is *Narcissism*? How can we see this in today’s world?
3. “Yoga is just exercise. It is possible to do these with no reference to religion so this fitness practice is valid for Christians”. Present arguments against this statement. Switch “yoga” for “pole dancing” if you prefer.
4. “Young strong and physically striking people are naturally the best advocates for the Christian faith”. Discuss this comment.
5. “This is my body. As long as I don’t hurt others I can put whatever I like into it and take what I want out of it, (e.g. a fetus), tattoo or pierce it, as there are no victims.” Respond to this comment.
6. Mother Teresa was a famous spiritual “mother” who never had biological children. The impact of her life was huge. Name some other spiritual mothers and fathers who have served the Kingdom well, some may be local and known to you.
7. List the different reasons people might have for wanting to lose weight. Which of these reasons are good and which are bad?
8. Draw a mind map with branches listing the key activities you need to pursue to maintain a body at optimal health for ministry. For the branch “nutrition” add on the key factors which make for a wholesome diet.
9. Some Christians believe that cremation is wrong as it shows disrespect for the body that God gave to us. What are your thoughts on this?
10. Gluttony was a topic much preached about in the past, but since the end of World War 2 it has not featured much as a sermon topic and has been a sin much excused. Why might this be so?

Values education God is Pure and Holy

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 8

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.

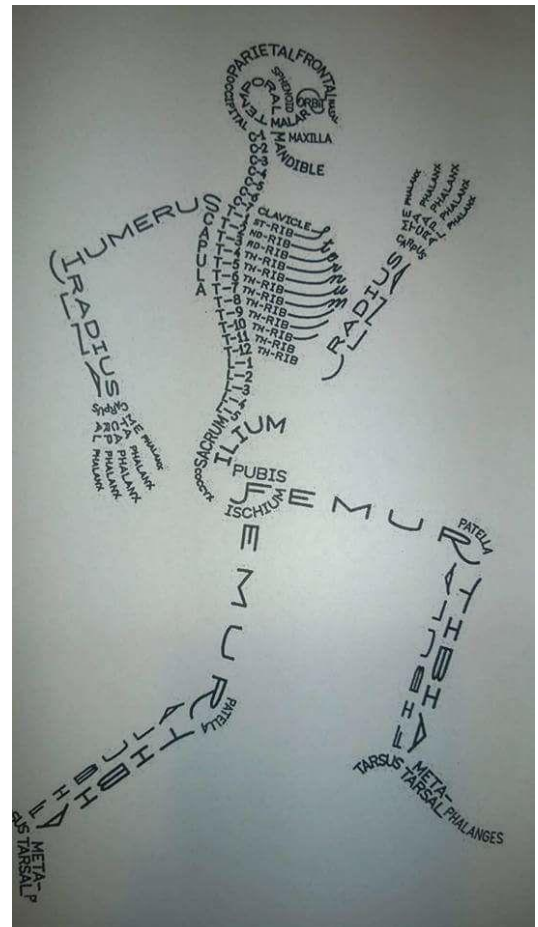
Do we see 'Humanism' at work in the world today?

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 Pure & Holy Year 8

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?

Topic: 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 Pure & Holy Yr 8

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

Thinking Skills Pure & Holy Yr 8

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

Lolohea Akosita Waqairawai, Fiji

Biography

Lolohea Akosita Waqairawai was born on 18 March 1893, the third child of Maikeli Ratu of Narewa, Nadi, and Litiana Neileqe Saurogo of Nakavu, Nadi, and had three sisters. Her father was a Methodist minister, and taught Lolohea to work hard to improve her life. She was educated at the first girls' school in Fiji (Matavelo Girls School in Ba) by the missionary sisters.

Lolohea was very intelligent and displayed exceptional ability, so when she was 17 years her minister, Rev Lelean, made arrangements for her to do further study at Manly Public School in Sydney, Australia, and then teacher-training at the Sydney Teachers College. She returned to Fiji at the end of 1914.

Lolohea first taught at Butt Street Primary School in Suva, and later at Davuilevu Primary School where she met and married Mosese Bulu. They had four children in five years, and then Mosese died. Later Lolohea married Timoci Waqairawai, a teacher from Jona, Kadavu. She had four sons from this marriage.

Lolohea and Timoci taught at Nadraivatu. In addition to her busy job as a teacher, and raising her eight children, Lolohea began her work with Women, visiting them in their homes and teaching them simple principles of hygiene, ante-natal care, child welfare, homecraft, sewing and general village sanitation. The family were moved to Vunidawa where they taught for 16 years from 1934-1950. Lolohea helped some poor but talented children to go to secondary school.

Lolohea helped set up a number of women's organizations which worked to improve the lives of women so that they could contribute to the development of their families and hence that of their communities and society. She believed that women play an important role in the development of any society, and that education was very important.

Lolohea became vice president of an organization for Fijian women, called *Qele ni Ruve*. The organization spread throughout Fiji and later changed its name to *Soqosoqo Vakamarama*. During her community training sessions for rural Fijian women, Lolohea appealed to Fijian men to lighten the burden of women by doing gardening and other domestic chores so that women could devote more time to family health and home management. She also advocated the use of local resources to upgrade the standard of living of rural families. Her commitment to family health and women's health culminated in her translating a book about childbirth into Fijian language (*Na Tina Ni Gone i Taukei*).

She thought the best way to enhance the status of women in Fiji was to promote their education. She put pressure on the government to establish a learning institution for Fijian girls. The Adi Cakobau School was established in 1948, being the first government secondary school for Fijian girls. Many girls excelled in their studies and influenced Fijian society.

Lolohea's contribution to community education and service continued even after she retired from teaching. She became a child welfare officer in 1950 and traveled extensively throughout Viti Levu conducting health education sessions. On many occasions she walked from one village to the next.

In 1956 she became the acting national leader for the Soqosoqo Vakamarama in Fiji. Lolohea Waqairawai was the first indigenous Fijian woman to represent Fiji in an international women's conference. As a member of the Pan Pacific South East Asian Women's Association (PPSEAWA), she was also actively involved in the promotion of the status of all Women in Fiji through racial tolerance and harmony. She believed that women could play a leading role in racial tolerance and encouraged women of different ethnic groups to learn and understand each other's culture.

Lolohea was awarded the British Empire Medal in 1948 and the Queen's Award for Meritorious Service to the Community in 1953. She had been a dedicated member of the Methodist Church all her life, and contributed two hymns to the Fijian Methodist Hymn book (Nos. 69 and 214).

Lolohea died in February 1967 at the age of 74. She was honoured for her inner strength and serenity, her dignity and humility. At her funeral service, Ratu Penaia Ganilau, (then Secretary for Fijian Affairs and Local Government), said "Lolohea's monument will be found in the closely knit and effective societies she built up in the remote parts of Viti Levu."

Questions:

1. If Lolohea was born in 1893, how old was she when she returned to Fiji after completing her education in Sydney, Australia?
2. How many children did she have?
3. What kind of work did she do to help women?
4. How did she help children?
5. What did she believe about the role of women in society?
6. What did she suggest that men should do to help lighten the work load for Fijian women?
7. Lolohea wrote a book. What was it called and what was it about?
8. How did she help to establish the first government secondary school for girls in Fiji? What was the name of the school?
9. How did Lolohea continue to help the community after she retired from teaching?
10. How was she honoured at her funeral?

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?

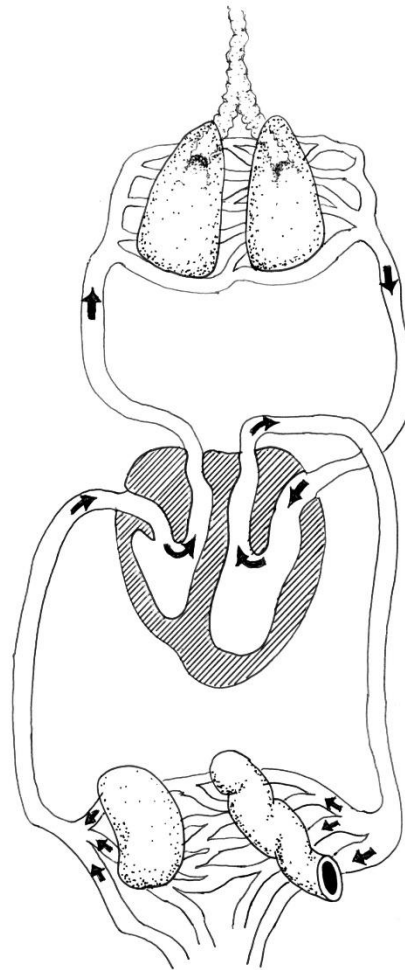
The Human Body 3

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 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:

- **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:

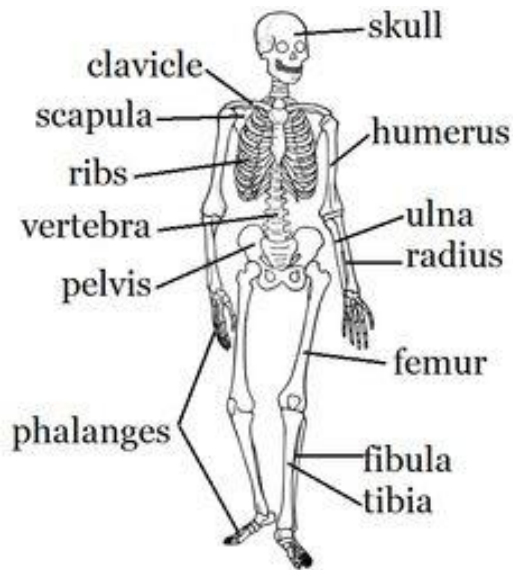
1. The axial skeleton consists of the skull, the spine and the rib cage. This part of the skeleton protects the brain, the heart and the lungs.
2. The appendicular skeleton consists of the bones of the arms, shoulders, legs and hips. This part of the skeleton has joints, which allow us to move, and do 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?

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) | Clavicle |
| 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.

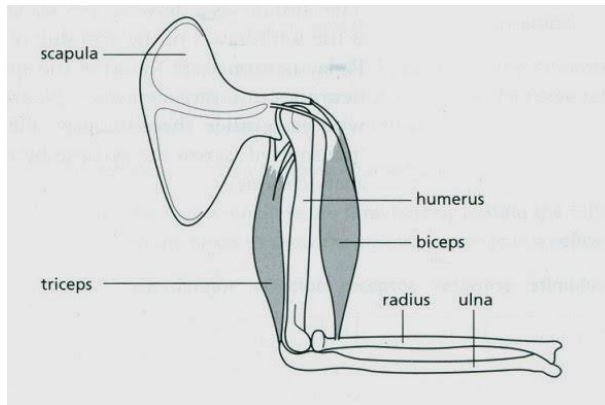
Good forms of weight-bearing exercise are: riding a bike uphill, walking uphill, climbing, lifting weights and swimming.

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.

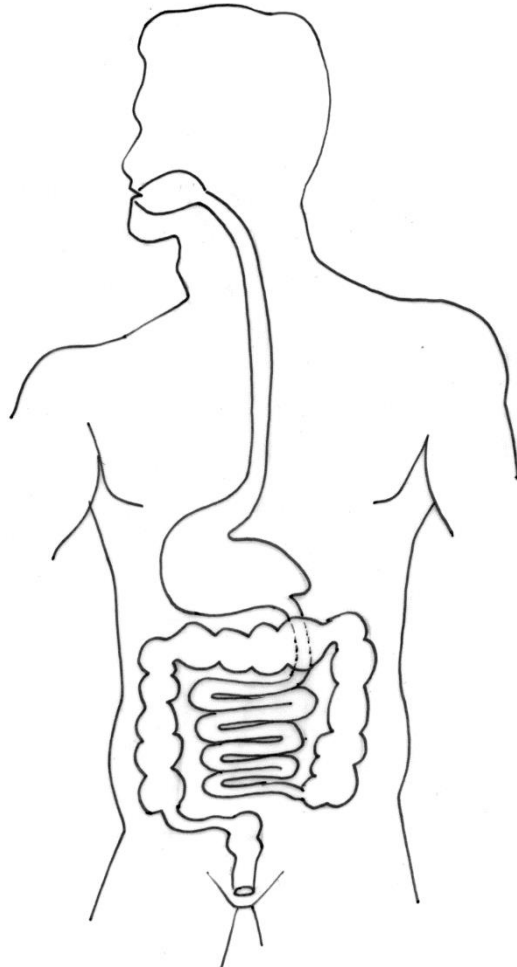
Then the food travels down the **oesophagus**. Muscles in the wall of this tube push the food along after it has been swallowed. The muscles make the food travel in little wave-like movements, until the food arrives in...

- 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.

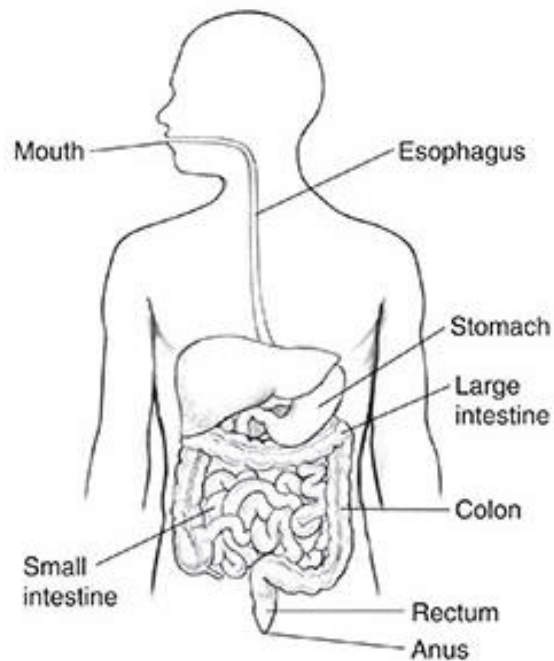
The path of food through the digestive system (copy)

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:

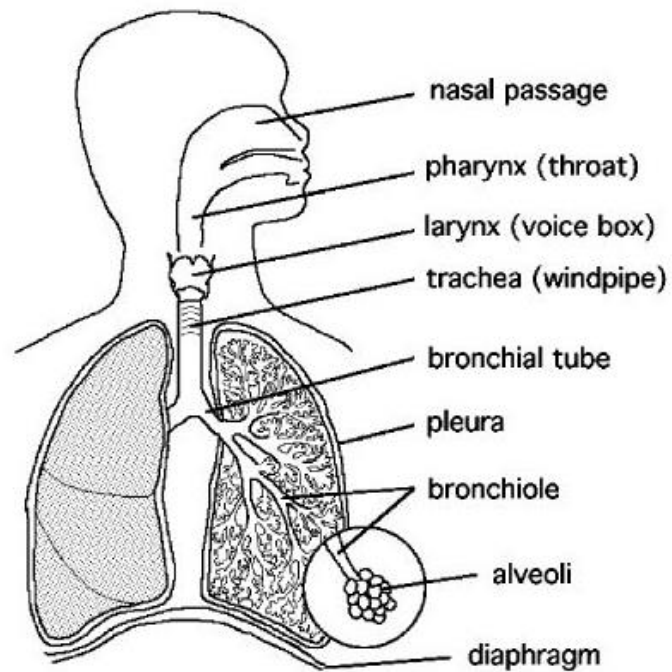
1. This is like a bag. Here acid and juices are mixed with the food to digest it.
2. Food that cannot be digested comes out here.
3. This is a long, narrow, bent-up tube. Most of the food is digested here. The goodness from the food is then taken by the blood to all parts of the body.
4. Water is taken 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

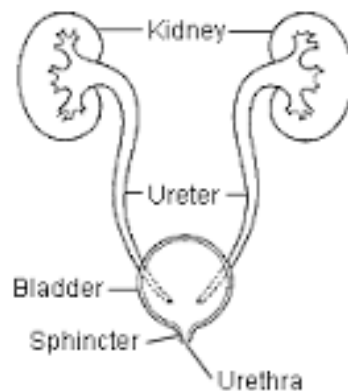
The urinary system

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

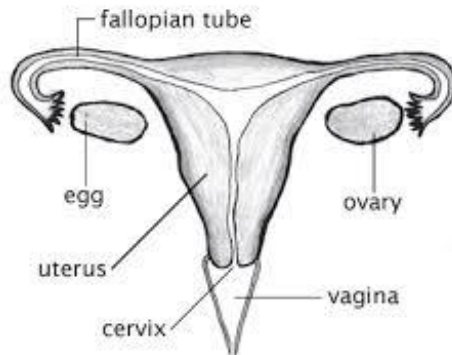
What should we do for health of the urinary system?

Answer: Drink plenty of _____.

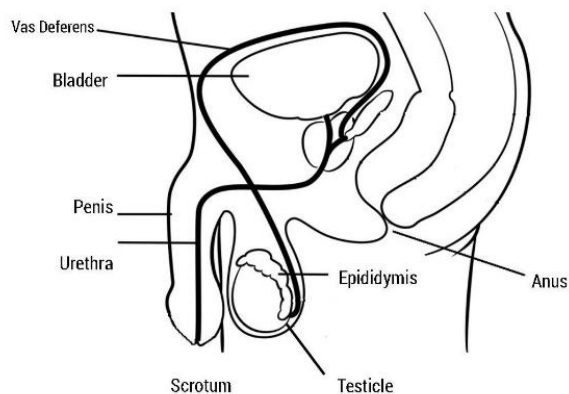
The Human Body 25

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 _____ .