After You Read

Mini Glossary

artery: a blood vessel that carries blood away from the heart

atriums (AY tree umz): the two upper chambers of the heart

capillaries (KAP uh ler eez): very small blood vessels that connect arteries and veins

coronary (KOR uh ner ee) circulation: the flow of blood to and from the tissues of the heart

pulmonary circulation: the flow of blood through the heart to the lungs and back to the heart

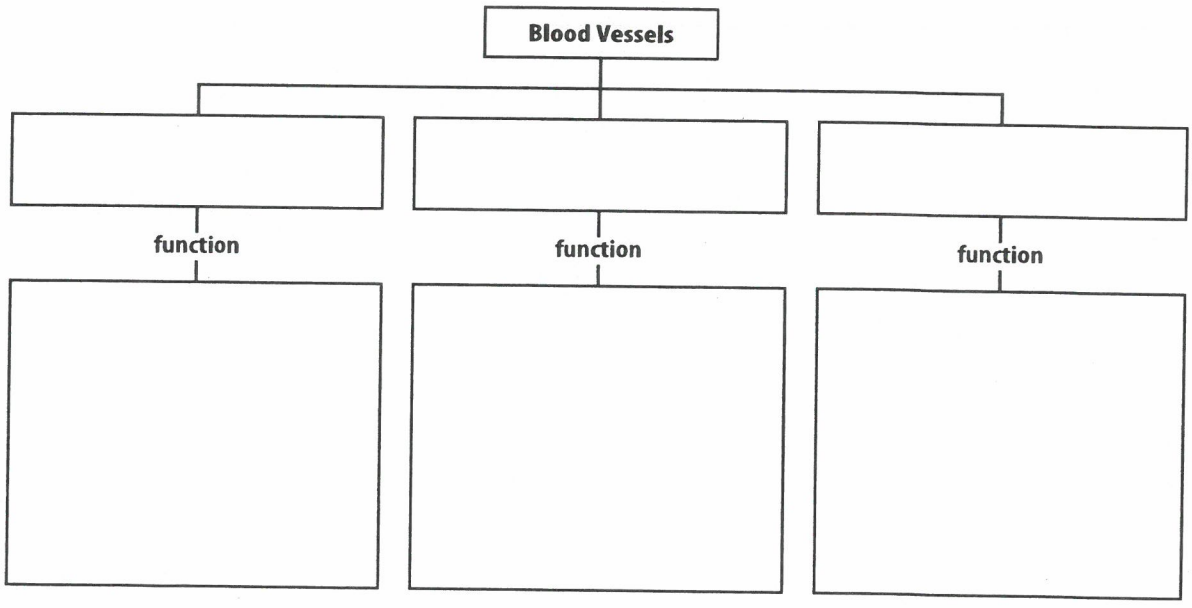
systemic circulation: the system in which oxygen-rich blood moves to all of the organs and body tissues, except the heart and lungs, and oxygen-poor blood returns to the heart

vein: a blood vessel that carries blood back to the heart

ventricles (VEN trih kulz): the two lower chambers of the heart

1. Review the terms and their definitions in the Mini Glossary. Write a sentence that explains the difference between pulmonary circulation and systemic circulation.

2. Complete the concept map below to show the kinds of blood vessels and their functions.



End of Section

ScienceOnline Visit **life.msscience.com** to access your textbook, interactive games, and projects to help you learn more about the circulatory system.

Blood Pressure and Heart Rate When blood pressure is higher or lower than normal, messages are sent to the brain by nerve cells in the arteries. One way the brain lowers or raises blood pressure is by speeding up or slowing down the heart rate. When blood pressure stays constant, enough blood reaches all organs and tissues in the body.

Cardiovascular Disease

There are many diseases that affect the cardiovascular system—the heart, blood vessels, and blood. Heart diseases are the leading causes of deaths in the United States.

What is atherosclerosis?

Atherosclerosis (ah thuh roh skluh ROH sus) is a leading cause of heart disease. In this condition, deposits of fat build up on the walls of the arteries. These fat deposits can block an artery. If a coronary artery is blocked, a heart attack can occur.

What happens with hypertension?

Hypertension (HI pur TEN chun) is high blood pressure. When blood pressure is higher than normal most of the time, the heart must work harder to keep blood flowing. Atherosclerosis is one cause of hypertension.

How does heart failure occur?

Heart failure occurs when the heart cannot pump blood efficiently. When the heart does not pump properly, fluid collects in the arms, legs, and lungs. A person with heart failure is usually short of breath and tired.

Can cardiovascular disease be prevented?

Cardiovascular disease can be prevented by following a diet that is low in salt, sugar, cholesterol, and saturated fats. Large amounts of body fat force the heart to pump faster. Relaxing and exercising help prevent tension and relieve stress. Exercising strengthens the heart and lungs and helps maintain proper weight. Not smoking also helps prevent heart disease.

Reading Check

6. **Apply** What is another name for high blood pressure?

_____

Reading Check

7. **Explain** What is one thing you can do to prevent cardiovascular disease?

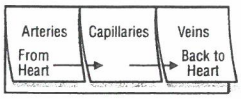
_____

_____

_____

FOLDABLES™

B Explain Make a three-tab Foldable, as shown below. Label the outside of the Foldable *Circulation*. Inside take notes on arteries, capillaries, and veins.



What is the function of arteries?

The blood vessels that carry blood away from the heart are called **arteries**. Arteries have thick, elastic walls made of connective tissue and smooth muscle tissue.

Each ventricle of the heart is connected to an artery. The right ventricle of the heart is connected to the pulmonary artery. The left ventricle of the heart is connected to the aorta. Every time your heart contracts, blood moves from your heart into your arteries.

How does blood flow in the veins?

A blood vessel that carries blood back to the heart is called a **vein**. Veins have one-way valves that keep blood moving toward the heart. If blood flows backward, the pressure of the blood against the valve causes it to close. Two major veins return blood from your body to your heart. The superior vena cava returns blood from your head and neck. The inferior vena cava returns blood from your abdomen and lower body.

What is the function of capillaries?

Very small blood vessels called **capillaries** connect arteries and veins. Nutrients and oxygen diffuse into body cells through the thin capillary walls. Waste and carbon dioxide diffuse from body cells into the capillaries.

Blood Pressure

When your heart pumps, the pressure of the push moves through the blood. The force of the blood on the walls of the blood vessels is called blood pressure. Blood pressure is highest in arteries and lowest in veins. When you take your pulse, you can feel the waves of pressure. This rise and fall in pressure occurs with each heartbeat. Normal resting pulse rates are 60 to 100 heartbeats per minute for adults, and 80 to 100 beats per minute for children.

How is blood pressure measured?

Blood pressure is measured in large arteries. Two numbers describe blood pressure, such as 120 over 80. The first number is a measure of the pressure caused when the ventricles contract and blood is pushed out of the heart. The second number is a measure of the pressure that occurs as the ventricles fill with blood just before they contract again.

Reading Check

5. **Describe** What does the first number in your blood pressure measure?

_____

_____

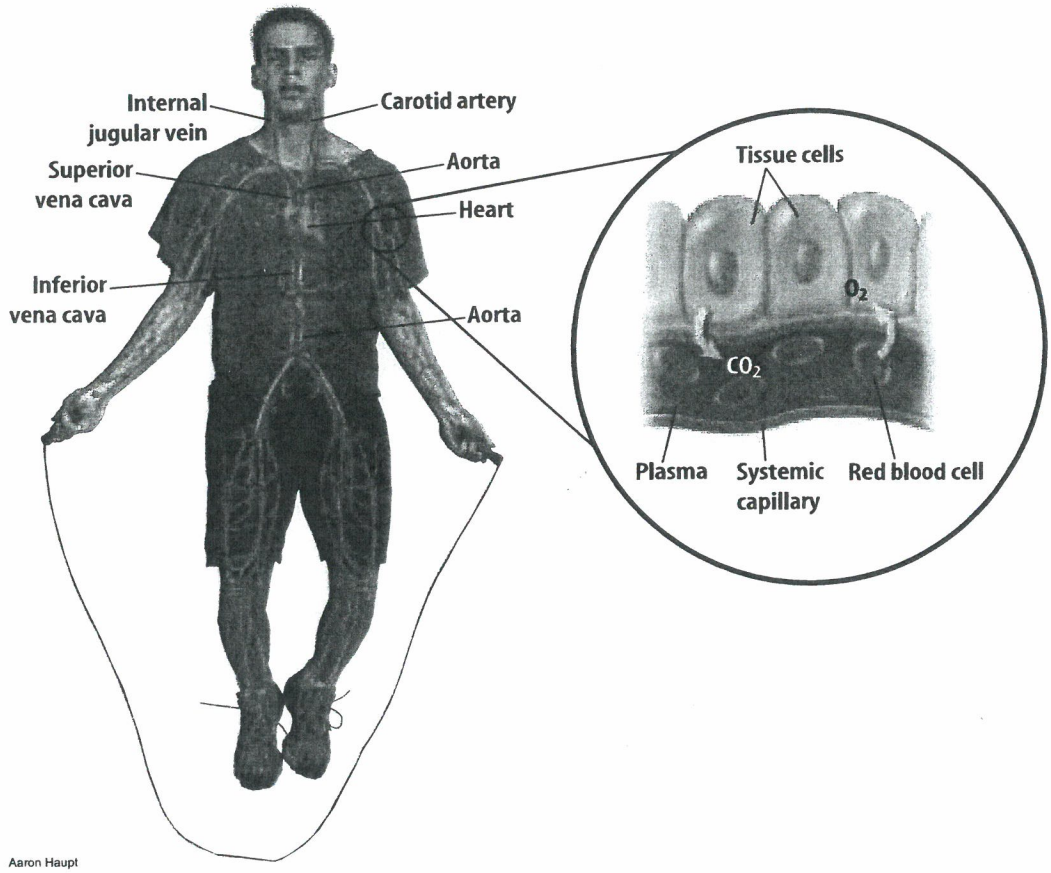
_____

What is systemic circulation?

Oxygen-rich blood moves to all of your organs and body tissues, except the heart and lungs, by **systemic circulation**. Oxygen-poor blood returns to the heart by systemic circulation. The figure below shows the major arteries and veins (VAYNZ) of the systemic circulation system. Oxygen-rich blood flows from your heart in the arteries. Then nutrients and oxygen are delivered by blood to your body cells and exchanged for carbon dioxide and wastes, as shown below. The blood then returns to your heart in the veins.

Think it Over

3. **Infer** Why is systemic circulation important to your muscles?



Aaron Haupt

Blood Vessels

In the middle 1600s, scientists proved that blood moves in one direction in a blood vessel, like traffic on a one-way street. They discovered that blood moves by the pumping of the heart and flows from arteries to veins. They couldn't explain how blood got from arteries to veins. With the invention of the microscope, scientists discovered that capillaries (KAP uh ler eez) connect the arteries and veins.

Picture This

4. **Identify** Circle the name of the blood vessel in which oxygen and carbon dioxide are exchanged.

Three Sections of the Circulatory System Scientists divide the circulatory system into three sections: coronary (KOR uh ner ee) circulation, pulmonary (PUL muh ner ee) circulation, and systemic circulation. The beating of your heart controls blood flow through each section. ☑

Reading Check

1. **Identify** What controls the blood flow through the three sections of the circulatory system?

What is coronary circulation?

Blood vessels supply the heart with nutrients and oxygen and remove wastes. **Coronary circulation** is the flow of blood to and from the tissues of the heart.

What is pulmonary circulation?

The flow of blood through the heart to the lungs and back to the heart is **pulmonary circulation**. Use the figure below to trace the path blood takes through this part of the circulatory system.

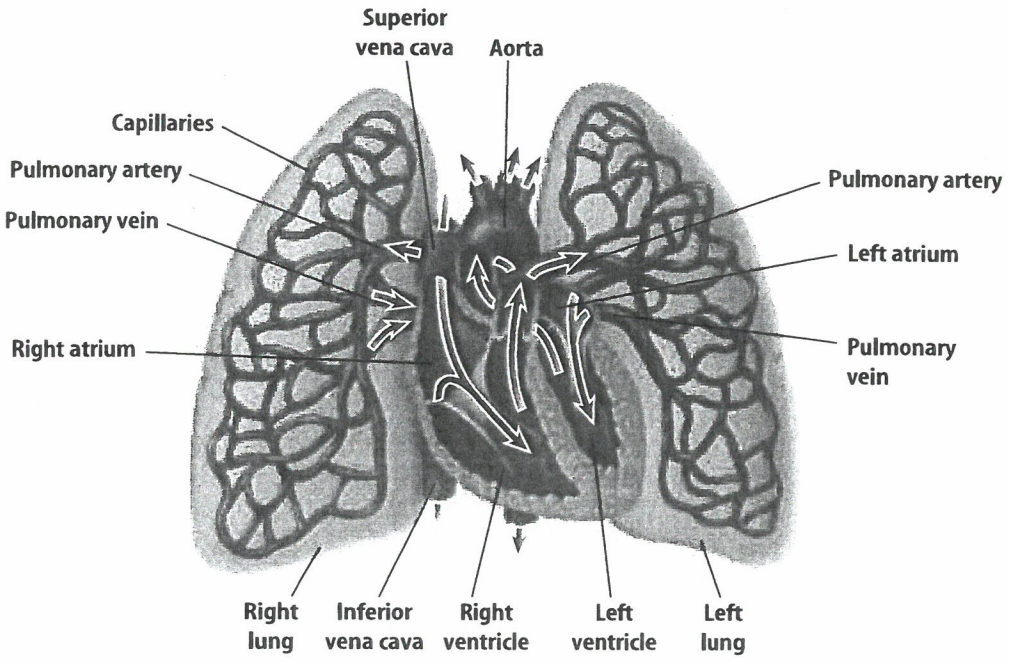
The blood returning from the body through the right side of the heart and to the lungs contains wastes from the body's cells. Carbon dioxide is one of these wastes.

In the lungs, carbon dioxide and other gaseous wastes diffuse out of the blood, and oxygen diffuses into the blood. Then the blood returns to the left side of the heart.

In the final step of pulmonary circulation, the oxygen-rich blood is pumped from the left ventricle into the aorta (ay OR tuh). The aorta is the largest artery in your body. Next, the oxygen-rich blood flows to all parts of your body.

Picture This

2. **Explain** to a partner the flow of blood in pulmonary circulation.



chapter 13 Circulation

section 1 The Circulatory System

Before You Read

Explain the function of the plumbing system in your home. Describe how it works.

_____

_____

_____

What You'll Learn

- the differences among arteries, veins, and capillaries
- how blood moves through the heart
- the functions of the pulmonary and systemic circulation systems

Read to Learn

Mark the Text

Identify Main Ideas After you have read the material under each question head, highlight the answer to the question.

How Materials Move Through the Body

The cardiovascular (kar dee oh VAS kyuh lur) system supplies materials to and removes wastes from your body cells. This system includes your heart, blood vessels, and blood.

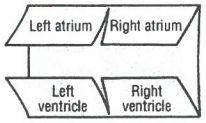
Movement of materials into and out of your cells occurs by diffusion (dih FYEW zuhn) and active transport. Diffusion occurs when a material moves from an area where there is more of it to an area where there is less of it. Nutrients and oxygen diffuse from your blood into your body's cells. Active transport is the opposite of diffusion. Active transport needs energy from the cell to occur.

The Heart

Your heart is an organ made of cardiac muscle tissue. Your heart has four compartments called chambers. The two upper chambers are called the right and left **atriums** (AY tree umz). The two lower chambers are called the right and left **ventricles** (VEN trih kulz). During one heartbeat, both atriums contract at the same time. Then, both ventricles contract at the same time. A one-way valve separates each atrium from the ventricle below it.

FOLDABLES™

A Describe Make a shutterfold book, as shown below. Identify the four chambers of the heart. Include a sketch of the heart and the four chambers.



After You Read

Mini Glossary

chemical digestion: digestion that takes place when chemical reactions break down large molecules of food into smaller ones

chyme (KIME): food from the stomach that has been changed into a thin, watery liquid that moves into the small intestine

digestion: the process that breaks down food into small molecules so that they can be moved into the blood and absorbed by the cells

enzyme (EN zime): a type of protein that speeds up the rate of a chemical reaction in the body

mechanical digestion: digestion that takes place when food is chewed, mixed, and churned

peristalsis (per uh STAHL sus): waves of muscle contractions

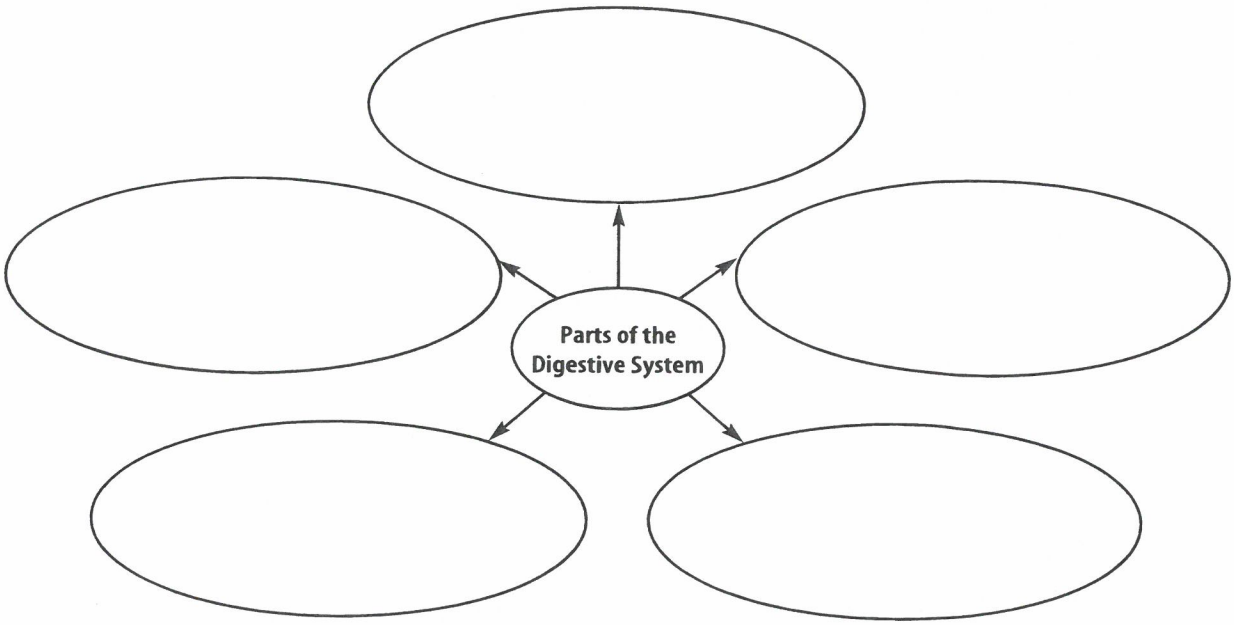
villi (VIH li): fingerlike projections in the small intestine

1. Review the terms and their definitions in the Mini Glossary. Write a sentence explaining the difference between mechanical digestion and chemical digestion.

_____

_____

2. Complete the web diagram below by listing the major parts of the digestive system and describing the role of each in digestion.



End of Section

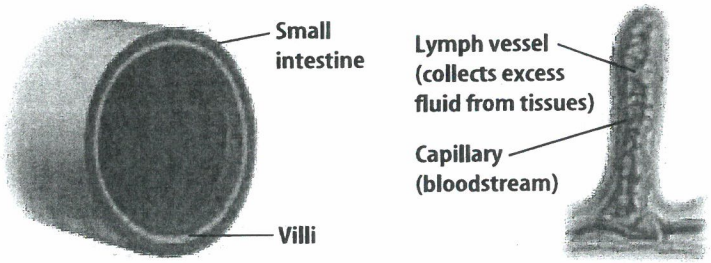
ScienceOnline Visit **life.msscience.com** to access your textbook, interactive games, and projects to help you learn more about the digestive system.

What fluids are added in the small intestine?

Chyme enters the first part of the small intestine called the duodenum (doo AH duh num). Most digestion takes place there. Bile, a greenish fluid from the liver, is added in the duodenum. Bile breaks the large fat particles in chyme into smaller particles. Chemical digestion of carbohydrates, proteins, and fats occurs when a digestive solution from the pancreas is mixed in. The solution neutralizes the stomach acid in the chyme.

How is food absorbed in the small intestine?

Food is absorbed from the small intestine into the bloodstream. The wall of the small intestine has many ridges and folds that are covered with fingerlike projections called **villi** (VIH li). Villi, shown in the figure below, increase the surface area of the small intestine, giving nutrients in the chyme more places to be absorbed. Nutrients move into the blood vessels in the villi. Peristalsis moves undigested and unabsorbed materials into the large intestine.



What happens in the large intestine?

The main job of the large intestine is to absorb water from the undigested materials. This keeps large amounts of water in the body and helps maintain homeostasis. After the water is absorbed, the remaining undigested materials become more solid. Muscles in the rectum and the anus control the release of the wastes from the body in the form of feces (FEE seez). ☑

Bacteria Are Important

Bacteria live in many parts of the digestive tract. Bacteria in the large intestine feed on undigested material like cellulose. Bacteria make Vitamin K and two B vitamins, niacin and thiamine. Vitamin K is needed for blood clotting. The B vitamins help the nervous system and other body functions.

Picture This

4. **Describe** why villi are important to the digestive process.

_____

_____

_____

Reading Check

5. **List** the main job of the large intestine.

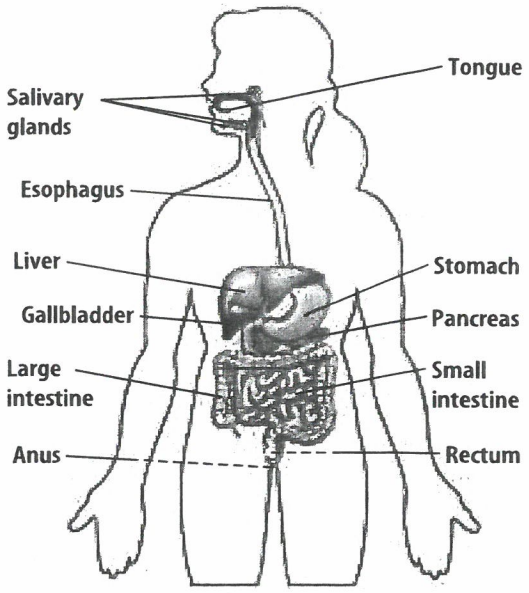
_____

_____

_____

What does the esophagus do?

Food passes over the epiglottis (ep uh GLAH tus) as it moves into the esophagus. The epiglottis automatically covers the opening to the windpipe to stop food from entering it. Food moves down the esophagus to the stomach, as shown in the figure below. Mucous glands in the esophagus keep the food moist. Smooth muscles in the esophagus move the food downward with a squeezing action. These muscle contractions, called **peristalsis** (per uh STAHL sus), move food through the entire digestive tract. No digestion happens in the esophagus.



Picture This

2. **Identify** Circle the names of the organs of the digestive tract. Highlight the names of the accessory organs.

How does the stomach help digestion?

The stomach is a bag of muscle. Both mechanical and chemical digestion take place in the stomach. Mechanical digestion happens when food is mixed in the stomach by peristalsis. Chemical digestion happens when food in the stomach mixes with enzymes and strong digestive acids, such as hydrochloric acid solution.

The acidic solution works with the enzyme pepsin to digest protein. The acidic solution also destroys bacteria present in the food. ☑

The stomach also produces mucus, which makes food more slippery and protects the stomach from the strong digestive solutions. Food moves through the stomach and is changed into a watery liquid called **chyme** (KIME). Chyme moves out of the stomach into the small intestine.

☑ Reading Check

3. **Describe** how an acidic solution helps digestion.

_____

_____

_____

How do enzymes help digestion?

Enzymes help you digest different nutrients. Amylase (AM uh lays) is an enzyme made by glands near the mouth. Amylase helps speed up the breakdown of complex carbohydrates, such as starch, into simpler carbohydrates—sugars. The enzyme pepsin works in the stomach to help the chemical reactions that break down proteins. Enzymes in the small intestine help to break down proteins into amino acids. ☑

The pancreas, an organ on the back side of the stomach, releases enzymes into the small intestine. Some of these enzymes continue the starch breakdown that started in the mouth. The sugars from this breakdown are turned into glucose and are used by the body's cells. Some enzymes from the pancreas help break down fats into fatty acids. Other enzymes from the pancreas aid the breakdown of proteins.

What else do enzymes do?

Enzymes help speed up chemical reactions that help your body grow. Muscle and nerve cells use enzymes to produce energy. Blood needs enzymes to clot.

Organs of the Digestive System

Your digestive system has two parts—the digestive tract and the accessory organs. The parts of the digestive system are shown on the next page.

What are the parts of the digestive tract?

The digestive tract includes the mouth, esophagus (ih SAH fuh guhs), stomach, small intestine, large intestine, rectum, and anus. Food passes through all of these organs. The accessory organs include the tongue, teeth, salivary glands, liver, gallbladder, and pancreas. Food does not pass through these organs. However, the accessory organs help with mechanical and chemical digestion.

What part does the mouth play in digestion?

Both mechanical and chemical digestion take place in the mouth. Mechanical digestion happens when you chew your food. Chemical digestion happens when the tongue moves food around and mixes it with saliva (suh LI vuh).

Saliva is made by three glands near the mouth. Saliva contains an enzyme that helps break down starch into sugar. After the food is swallowed, it passes into the esophagus.

Reading Check

1. **Explain** What does amylase do?

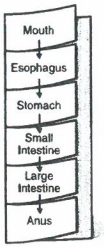
_____

_____

_____

FOLDABLES™

Sequence Make a six-tab book, as shown below, to identify how food moves through the digestive system.



chapter 18 Nutrients and Digestion

section 2 The Digestive System

What You'll Learn

- the differences between mechanical digestion and chemical digestion
- the organs of the digestive system and what they do
- how homeostasis is maintained in digestion

Before You Read

Read the title of this chapter above. On the lines below, tell how you think nutrients and digestion are related.

_____

_____

_____

Mark the Text

Identify the Main Point
Underline the main idea in each paragraph as you read.

Read to Learn

Functions of the Digestive System

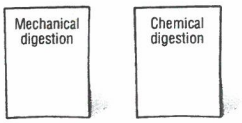
Your body processes food in four stages—ingestion, digestion, absorption, and elimination. Ingestion is when food enters your mouth. Digestion begins immediately.

Digestion is the process that breaks down food into small molecules so that they can move into the blood. Absorption occurs when food molecules move from the blood into the cells. Inside the cell, the food molecules break down even further so their energy and nutrients can be used by the cell. Elimination takes place when unused food molecules pass out of the body as wastes.

Digestion is mechanical and chemical. **Mechanical digestion** occurs when food is chewed, mixed, and churned. **Chemical digestion** takes place when chemical reactions occur that break down large molecules of food into smaller molecules.

FOLDABLES™

B Describe Use quarter sheets of notebook paper, as shown below, to write descriptions of mechanical and chemical digestion.



Enzymes

Enzymes (EN zimez) make chemical digestion possible. An **enzyme** is a type of protein that speeds up the rate of a chemical reaction in your body. Enzymes reduce the energy needed for a chemical reaction to start.

After You Read

Mini Glossary

amino acid: one of the small units that make up a protein molecule

carbohydrate (kar boh HI drayt): a molecule made up of carbon, hydrogen, and oxygen atoms; nutrient that is the main source of energy for the body

fat: necessary nutrient that provides the body with energy and helps it absorb vitamins; also known as a lipid

food group: foods that have the same type of nutrient

mineral: inorganic nutrient that takes part in many chemical reactions in the body

nutrient (NEW tree unt): substances in food that provide energy and materials for cells to develop, grow, and repair themselves

protein: large molecules that contain carbon, hydrogen, oxygen, nitrogen, and sometimes sulfur; one of the six kinds of nutrients

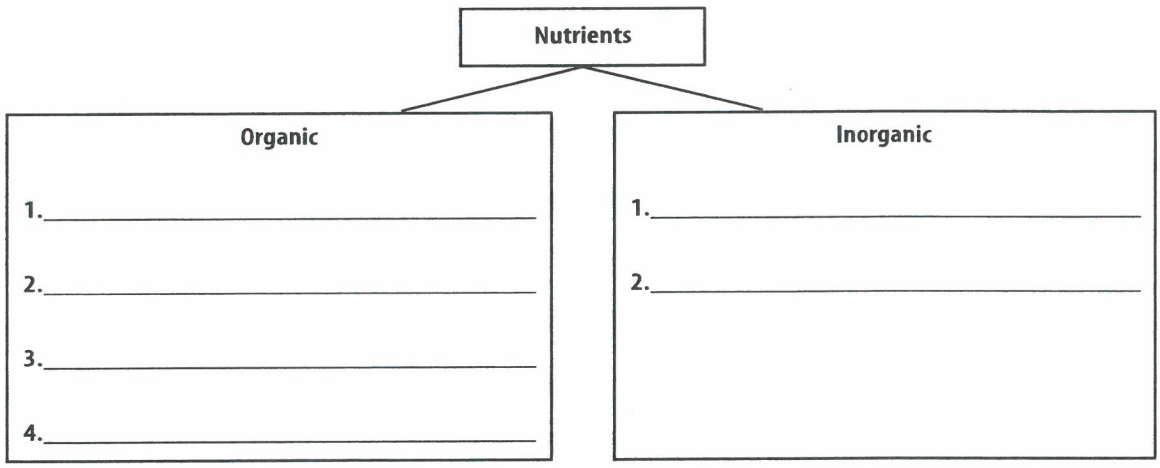
vitamin: nutrient that is needed in small amounts to help the body grow, to regulate body functions, and to prevent some diseases

1. Review the terms and their definitions in the Mini Glossary. Write a sentence that explains the relationship between amino acids and proteins.

_____

_____

2. Complete the diagram below by classifying the six kinds of nutrients.



3. How does your outline help you understand ideas about nutrition?

_____

_____

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End of Section

What are the five food groups?

Foods that have the same type of nutrient belong to a **food group**. There are five food groups: grains, vegetables, fruits, calcium-rich foods, and proteins.

Reading Check

11. Define What is a food group?

_____

_____

_____

What should you eat from each food group?

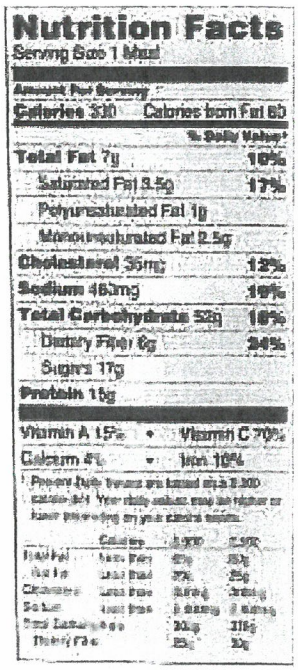
The food guidelines on the previous page show the recommendations for each food group. Eating the recommended amount for each group will give your body the nutrients it needs for good health. The size of a serving is different for different food groups.

Why should you read food labels?

The food labels, such as the one below, on all packaged foods contain nutritional facts about the foods. These facts can help you make healthful food choices. The labels can help you plan meals that include the recommended amounts of nutrients.

Picture This

12. Identify Circle the total number of Calories per serving on the label.



KS Studios

Water Loss Water makes up about 60 percent of the weight of your body. Most of the body's water is located in body cells. Water is also found around cells and in blood. Your body loses water when you perspire and when you exhale. Your body also loses water when it gets rid of wastes. To replace the amount of water your body loses each day, you need to drink about 2 L of liquids. Drinking liquids is not the only way to get water. Many foods, such as apples and meats, are made up of a large amount of water.

Why do you get thirsty?

When your body needs to replace water that it lost, messages are sent to your brain that make you feel thirsty. Drinking water satisfies your thirst. Drinking water also helps to restore the body's homeostasis (hoh mee oh STAY sus). When your body is in homeostasis, or balance, it has the right amount of water and the right temperature. When homeostasis returns, the messages to the brain stop, and you no longer feel thirsty.

Food Groups

No natural food has all the nutrients your body needs. You need to eat a variety of foods. Nutritionists have set up food guidelines to help people choose foods that supply all the nutrients the body needs for energy and growth. The guidelines are shown below.

Dietary Guidelines for Americans 2005 from the USDA

Food Group	Recommendations
Fruits	Eat a variety of fresh, frozen, canned, or dried fruits instead of fruit juice for most fruit choices. For a 2,000-Calorie diet, eat two cups of fruit each day.
Vegetables	Eat dark green vegetables and dark leafy greens. Eat orange vegetables, such as carrots and sweet potatoes. Also eat beans, peas, and lentils.
Calcium-rich Foods	Eat three cups of low-fat or fat-free milk products every day or choose lactose-free milk products and/or calcium-fortified foods and beverages.
Grains	Eat at least three ounces of grain products daily. Look for "whole grains" in the list of ingredients. In general, at least half the grains should be whole grains and the other enriched or whole-grain products.
Proteins	Choose lean meats and poultry. Vary your protein choices—with more fish, beans, peas, nuts, and seeds.

Reading Check

9. **Define** What is homeostasis?

_____

_____

_____

Picture This

10. **Apply** Beside each food group, write the approximate number of servings you ate in each food group yesterday.

Think it Over

7. **Describe** a major difference between the two groups of vitamins.

What is the difference between water-soluble and fat-soluble vitamins?

There are two groups of vitamins, water-soluble and fat-soluble. Water-soluble vitamins dissolve easily in water. Your body does not store these vitamins, so you need to get them every day. Fat-soluble vitamins dissolve only in fat. These vitamins are stored in the body.

You get most of your vitamins from food. However, your body makes some vitamins. For example, your body makes vitamin D when your skin is exposed to sunlight.

How do minerals affect the body?

Minerals are inorganic nutrients that take part in many chemical reactions in your body. Minerals build cells, send nerve impulses throughout your body, and carry oxygen to body cells.

Your body uses about 14 minerals. Of the 14 minerals, your body uses calcium and phosphorus in the largest amounts. Calcium and phosphorus help form and maintain bones. Some minerals, such as copper, are trace minerals. The body only needs very small amounts of trace minerals. Review the table below to learn more about some of the minerals your body uses.

Picture This

8. **Identify** Which minerals does your body use to help conduct nerve impulses?

Health Benefits of Minerals from Your Food

Mineral	Health Effect	Food Sources
Calcium	builds strong bones and teeth, helps blood clotting and muscle and nerve activity	milk, cheese, eggs, green leafy vegetables, soy
Phosphorus	builds strong bones and teeth, helps muscles contract, stores energy	cheese, meat, cereal
Potassium	balances water in cells, conducts nerve impulses, helps muscles contract	bananas, potatoes, nuts, meat, oranges
Sodium	balances fluid in tissues, conducts nerve impulses	meat, milk, cheese, salt, beets, carrots, nearly all foods
Iron	moves oxygen in hemoglobin by red blood cells	red meat, raisins, beans, spinach, eggs
Iodine (trace)	helps thyroid activity, stimulates metabolism	seafood, iodized salt

Why is water an important nutrient?

Next to oxygen, water is the most important thing your body needs for survival. You could live a few weeks without food but only a few days without water. Cells need water to carry out their work. Many other nutrients that the body needs have to be dissolved in water before they can be used.

What is the difference between starch and fiber?

Starch and fiber are complex carbohydrates. Starch is found in potatoes and in foods made from grains such as pasta. Starches are made up of simple sugars strung together in long chains. Fiber is found in the cell walls of plant cells. Foods such as whole-grain breads, cereals, beans, and vegetables and fruits are good sources of fiber. You cannot digest fiber, but it is needed to keep your digestive system running smoothly.

How does the body use fats?

Fats, also called lipids, provide the body with energy and help it absorb vitamins. Fat tissue cushions the body's internal organs. A major part of every cell membrane is made up of fat. Fats release more energy than carbohydrates do. When food is being digested, fat is broken down into smaller molecules called fatty acids and glycerol (GLIH suh rawl). Fat is a good storage unit for energy. Your body takes excess energy from the foods you eat and changes it to fat that is stored for later use.

What are saturated and unsaturated fats?

There are two kinds of fats, unsaturated fats and saturated fats. Unsaturated fats are usually liquid at room temperature. Vegetable oil is an example of an unsaturated fat. Saturated fats are usually solid at room temperature. Saturated fats are found in meats, animal products, and some plants.

Eating too many saturated fats has been linked to high levels of cholesterol in the body. Cholesterol is part of the cell membrane in all of your cells. However, a diet that is high in cholesterol can cause deposits to form on the inside walls of blood vessels. The deposits can keep the blood supply from getting to organs. The deposits also can increase blood pressure and lead to heart disease and strokes.

What are vitamins?

Vitamins are nutrients that the body needs in small amounts. Vitamins help the body grow, help keep the body functioning properly, and help prevent some diseases. Most foods contain some vitamins. However, no single food has all the vitamins you need.

Think it Over

5. **Explain** why fats are an important part of a healthful diet.

_____

_____

_____

Reading Check

6. **Determine** which fat is usually liquid at room temperature and which fat is solid.

_____

_____

_____

Absorption of Nutrients Foods with carbohydrates, fats, and proteins have to be digested or broken down before the body can use them. Water, vitamins, and minerals are absorbed directly into the bloodstream.

How does the body use proteins?

Proteins replace and repair body cells and help the body grow. **Proteins** are large molecules that contain carbon, hydrogen, oxygen, nitrogen, and sometimes sulfur. A protein molecule is made up of many smaller units called **amino acids**. Different foods have different amounts of protein, as shown in the table below.

Calories and Protein in Selected Food Items

Food	Calories	Protein
Pepperoni pizza (1 slice)	280	16 g
Large taco	186	15 g
Banana split	540	10 g

What are essential amino acids?

Your body needs 20 amino acids to make the thousands of proteins that your cells use. Most of the amino acids can be made in the body's cells. Eight of the amino acids, however, cannot be made by the body. These eight are called essential amino acids. You have to get them from the food you eat. Foods that provide all eight essential amino acids are called complete proteins. Complete proteins are found in eggs, milk, cheese, and meat. Incomplete proteins are missing one or more of the essential amino acids. Vegetarians need to eat a wide variety of protein-rich vegetables, fruits, and grains to get all eight essential amino acids.

Why are carbohydrates important?

Carbohydrates (kar boh HI drayts) are the main sources of energy for your body. A carbohydrate molecule is made up of carbon, hydrogen, and oxygen atoms. Energy holds these atoms together. When carbohydrate molecules break apart in the cells, energy is released for your body to use.

What are the three types of carbohydrates?

The three types of carbohydrates are sugar, starch, and fiber. Sugars are simple carbohydrates. Table sugar is one of these sugars. Fruits, honey, and milk also contain forms of sugar. Your cells break down glucose, which is a simple sugar.

Picture This

2. **Determine** Which of the food choices in the table has the most Calories?

3. **Explain** What unit is used to measure protein?

4. **Identify** Which of the food choices in the table provides the least protein?

FOLDABLES

A Classify Make a folded table, as shown below, to explain how your body uses proteins, carbohydrates, and fats.

Nutrients	How body uses	Nutrient becomes
Proteins		
Carbo-hydrates		
Fats		

chapter 18 Nutrients and Digestion

section 1 Nutrition

Before You Read

List on the lines below five foods that you think are good for you, or are nutritious. Explain what makes them nutritious.

_____

_____

What You'll Learn

- the six kinds of nutrients
- why each nutrient is important
- how your diet affects your health

Read to Learn

Study Coach

Use an Outline As you read, make an outline to summarize the information in the section. Use the main headings in the section as the main headings in the outline. Add information under each heading in the section.

Why do you eat?

Your body needs energy for every activity that it performs. You need energy to run, blink your eyes, and lift your backpack. This energy comes from the foods you eat. The foods you eat also give your body the nutrients it needs. **Nutrients** (NEW tree unts) are substances in food that provide the energy and materials cells need to develop, grow, and repair themselves.

How is the energy in food measured?

The amount of energy you need depends on your body mass, age, and how active you are. The amount of energy in food is measured in Calories. A Calorie (Cal) is the amount of heat needed to raise the temperature of 1 kg of water 1°C. The number of calories in a food depends on the kinds of nutrients the food contains.

Classes of Nutrients

Six kinds of nutrients are found in food. The six nutrients are proteins, carbohydrates, fats, vitamins, minerals, and water. Proteins, carbohydrates, vitamins, and fats are organic nutrients because they contain carbon. Minerals and water are inorganic nutrients because they do not contain carbon. ☑

Reading Check

1. **Identify** three nutrients found in foods.

_____

_____

_____

Seymour College

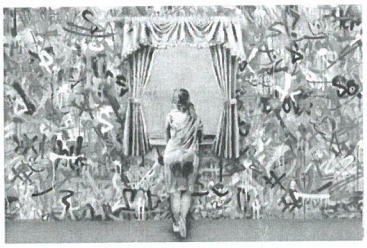
Humanities Work Pack, 2021
Year 8 Humanities: General Tasks

Learning Intention	**Success Criteria**
• Exploring the concept of law and decision-making • Understanding how to participate in a debate • Analysing source material	▪ I understand the concept and purpose of law-making ▪ I can use source materials to support my understanding ▪ I can participate in a debate about a significant topic or issue

Instructions to Students:

Please follow the instructions on each page for each individual task. Each lesson is numbered 1 through 5 and should take approximately 20-40 minutes to complete. If you need any further support please call or email your Humanities teacher and they will be happy to assist you further.

Lesson 1	Art or Vandalism
Lesson 2	Graffiti
Lesson 3	Debate
Lesson 4	Debate
Lesson 5	Laws and Regulation



Art or Vandalism?

An Analysis of Australia's Graffiti laws

LESSON 1: Using the 'Graffiti Laws' handout, complete the following tasks:

1. What is 'Graffiti'? How is it similar and different to vandalism?

2. Why do you think we have laws against vandalism in public places?

3. In the space below, list some arguments for graffiti being considered as an art form and some reasons for it to be consider as vandalism:

Art	Vandalism

4. Who do the laws surrounding vandalism aim to protect?

5. Who might not agree with these laws? Why wouldn't they?

6. List the penalties (punishments) a person could receive if they are found guilty of doing graffiti in a public place:

7. How do graffiti laws help ensure society functions cohesively?

8. In the Venn Diagram below, outline three more advantages and three more disadvantages of making graffiti legal in more public areas. In the middle you might like to put common themes between these:

GRAFFITI LAWS

This fact sheet details graffiti laws and related search powers in Victoria as at **August 2012**.

GRAFFITI CRIMES

Tough graffiti laws in Victoria give police and Protective Services Officers (PSOs) special powers to search, arrest, fine or charge you. Penalties range from on-the-spot fines to imprisonment.

1. Marking graffiti

Graffiti is writing, drawing, marking, scratching or defacing property in a way that cannot be removed by a dry cloth. Graffiti is a crime if it is done on property without permission from the owner.

2. Criminal damage or wilful damage

Alternatively, police may charge you with criminal damage or wilful damage for marking graffiti.

3. Marking offensive graffiti

Marking offensive graffiti is a crime, whether or not you have permission from the owner of the property. 'Offensive' means it would offend a reasonable person and it is not reasonable political comment.

4. Carrying a spray can

It is illegal to carry a spray can in certain places.

You can be fined or charged if police or PSOs find you carrying a spray can while you are either:

- on public transport property
- in a public place that is next to public transport property
- trespassing on private property

It is an offence to carry a spray can in those situations, even if you had no intention of marking graffiti.

It is a defence if you carry a spray can on public transport for your trade or employment. It is not a defence if you carry a spray can for other reasons, such as education, training or a recreational art program.

If you are caught carrying a spray can in those areas you may be issued an on-the-spot fine of around $700 or you may be charged in court.

5. Carrying a graffiti implement with an intention to graffiti

The police can charge you in court if you are carrying any type of graffiti implement and you intend to mark graffiti.

A graffiti implement is anything that can be used to mark graffiti including spray cans, textas, markers, stickers or any tool for scratching.

The police need evidence to prove you have an intention to graffiti. Things like paint stains on your fingers or being in an area with fresh graffiti can be enough for the police to prove intent.

SEARCH POWERS

☞ ***Can I be searched for graffiti tools?***

The police and PSOs can search you on the spot for graffiti implements if you are 14 years old and over.

A police officer or a PSO can search you if he/she has reasonable grounds to suspect you are carrying a graffiti implement. This might be because you are in a place marked with fresh graffiti or where there is lots of graffiti around.

Unlike police, PSOs can only search you if you are in or near a train station e.g. in the train station car park, a bus or taxi rank outside the station or a road that leads to the station.

☞ *What do I do if police or PSOs stop me?*

Generally, you **must** give your name and address to the police or a PSO if you are asked.

You have a right to ask police or PSOs for their name, rank and station if they stop you and ask for your details.

You also have the right to ask for a **written record** if you are searched.

☞ *What kind of search can they do?*

Before a police officer or a PSO can start to search you, they must show you their badge or ID, tell you their name, rank and station and ask you to hand over any graffiti tools.

If you are over 14 but under 18 years of age, police and PSO searches are limited to

- inspecting your bag or anything you are carrying;
- asking you to remove your outer clothing, e.g. your coat and hat, gloves and shoes
- doing a 'pat down' search

If you are over 18, police and PSOs must conduct searches as quickly as possible and in a way that respects your privacy.

Police and PSOs may confiscate any graffiti tools they find during their search.

☞ *Can a ticket inspector stop and search me for graffiti tools?*

A ticket inspector (Authorised Officer) can ask you for your name and address if they reasonably suspect you have committed or you are about to commit a graffiti or transport-related offence.

A ticket inspector **cannot** search you or your bags for graffiti tools. However, if graffiti tools are visible (e.g. in your hand or sticking out of your bag or pocket) a ticket inspector can ask you to hand the graffiti tools over. If you do not, they can use reasonable force to take the items from you.

GETTING LEGAL HELP

Youthlaw
If you are under 25, you can get free and confidential legal advice.
For more information or to speak to a lawyer:
☎: (03) 9611 2412 (9am-5pm, Mon-Fri)
🖱: www.youthlaw.asn.au

Victoria Legal Aid - Legal Help
For legal information, referrals or appointments.
☎: (03) 9269 0120
1800 677 402 (country callers)
🖱: www.legalaid.vic.gov.au

funded by a grant from Victoria Law Foundation
Grants Publications Education

LESSON 2:

People have suggested that stricter laws need to be made in order to reduce the levels of crime on our streets. Others have suggested that the government set up public areas where graffiti is legal, giving artists a safe space to do their work without impacting the public.

Using these websites as a starting point, answer the questions below:

http://www.lawstuff.org.au/vic_law/topics/Graffiti
http://www.crimeprevention.nsw.gov.au/Pages/cpd/protectcommunity/graffitivandalism/facts_and_figures.aspx

1. Is graffiti a state or federal law?

2. Are the graffiti laws written in the Constitution? What is the Constitution?

3. Explain two reasons why a law may need to be introduced or changed.

4. What is the main objective of introducing stricter laws in order to reduce crime levels in relation to graffiti? Do you think these laws would be successful? Why/why not?

5. Do you think a change to the current vandalism laws is needed? Why/why not?

LESSON 3 & 4: Have a debate with yourself!

A debate is when two or more people argue about a significant issue or topic. Unfortunately, that can be difficult to do during remote learning, so the next best thing will be to have a debate with yourself! First you must pick an issue or topic from the list below and then write arguments covering both perspectives (for and against)

Possible debate Topics:

- Should school uniform be abolished?
- Should the legal driving age in Victoria be lowered to 17?
- Should everyone have to participate in school sport?

Steps to complete the debate:

1. Pick an issue from the list or decide on your own relevant topic
2. Research the issue – if you don't have access to the internet you can ask family to help you brainstorm some arguments for and against the topic.
3. Decide on three arguments for each side of the debate (for and against)
4. Elaborate on these arguments using your research or ideas you have brainstormed. If you have access to the internet you could look up some statistics or other information to support your ideas.
5. Complete the debate planning sheet on the next page. There are spaces for an introduction and 3 arguments per side.
6. Run through the arguments one by one, and then decide which side of the topic you have argued more successfully for – this is the side which will win the debate!

YEAR 7 DEBATING SHEET

Topic:

_____

_____

	MAIN POINTS AND DETAILS
OPENING STATEMENT: Explain position on the issue and introduce your arguments/ideas	
ARGUMENT #1 (FOR)	
ARGUMENT #2 (FOR)	
ARGUMENT #3 (FOR)	

OPENING STATEMENT: Explain position on the issue and introduce your arguments/ideas	
ARGUMENT #1 (AGAINST)	
ARGUMENT #2 (AGAINST)	
ARGUMENT #3 (AGAINST)	

LESSON 5:

Your task for today is focused around laws and regulations which you think are important.

1. In your own words, what is a law?

2. What are some examples of laws that you know about? For example ; graffiti laws, dangerous driving and drink driving laws.

3. Who are the laws you have brainstormed above intended to protect? For example; drink driving laws are intended to protect safe drivers and pedestrians, as well as drink drivers themselves from serious harm.

4. If you could develop any new laws, what would you focus on improving? Why would you implement these laws and who would they protect?

MATHS MATE 8

Term 1 - Sheet 1

Name: .....

Due Date: ...../...../.....

Parent's Signature:

QUOTE OF THE WEEK

Advice is seldom welcome; and those who want it the most always like it the least.
Earl of Chesterfield

1. [+ Whole Numbers to 10]

	4	6	11	8	7	13	10	2	9	15
+ 3										

2. [– Whole Numbers to 10]

	15	17	8	6	13	9	11	12	10	14
– 4										

3. [× Whole Numbers to 12]

	4	5	10	8	7	11	3	6	9	12
× 2										

4. [÷ Whole Numbers to 12]

	5	10	40	45	30	35	20	15	50	25
÷ 5										

5. [Large Number +,–] *

$2453 - 249 =$ ☐

6. [Large Number ×,÷] *

$3070 \div 10 =$ ☐

7. [Decimal +,–] *

$3.57 + 4.81 =$ ☐

8. [Decimal ×,÷] *

$0.35 \times 10 =$ ☐

9. [Fraction +,–]

$\frac{5}{7} + \frac{1}{7} =$ ☐

10. [Fraction ×,÷] *

$5 \times \frac{3}{7} =$ ☐

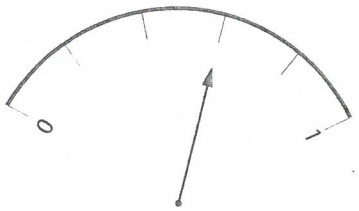
11. [Percentages] *

In Australia 32% of women will never marry. What percentage of women will marry?

☐

12. [Decimals / Fractions / Percents]

What decimal number is shown on this meter?



☐

13. [Integers]

Arrange in ascending order:

5, –2, 3, –6, 7

☐

14. [Rates / Ratios]

Simplify the ratio

18 : 30 ☐ :

15. [Indices / Square Roots]

$6^2 =$ ☐

16. [Order of Operations] *

$3 + 7 \times 3 =$ ☐

17. [Exploring Numbers]

What is the value of the underlined digit in the number 9<u>6</u>4?

☐

18. [Multiples / Factors / Primes] *

List the common multiples of 4 and 5 up to 60.

☐

19. [Number Patterns]

Complete the pattern:

2, 10, 18, 26, ___, ___

20. [Expressions]

Simplify $t + t + t$ ☐

21. [Substitution] *

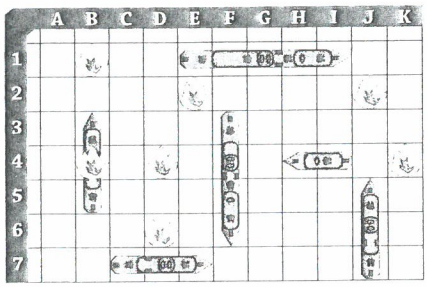
If $y = 8$, find the value of $3y + 7$ ☐

22. [Equations]

☐ $+ 7 = 13$

23. [Coordinates]

What is the grid reference of the enemy hit on the battleship?

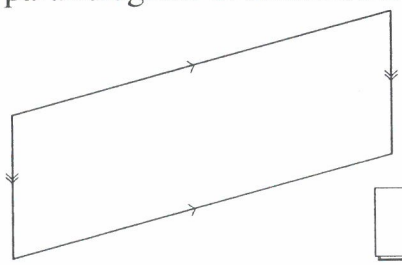


24. [Units of Measurement / Time] *

16 m = ☐ mm

25. [Perimeter] *

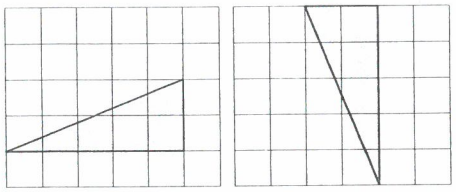
Use a ruler to find the perimeter of the parallelogram in millimetres.



☐ mm

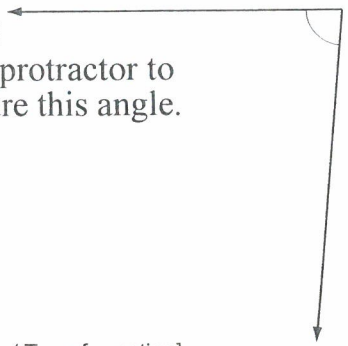
26. [Area / Volume]

Do these triangles have the same area?



27. [Shapes]

Use a protractor to measure this angle.



28. [Location / Transformation]

Draw all the axes of symmetry of this shape. How many axes of symmetry does this shape have?

29. [Statistics]

Which world region has the highest penetration of the internet?

World Internet Usage 2012		
World Regions	% popn. penetration	% of world usage
Africa	15.6	7.0
Asia	27.5	44.8
Europe	63.2	21.5
Middle East	40.2	3.7
North America	78.6	11.4
Latin America/Carribean	42.9	10.6
Oceania/Australia	67.6	1.0
WORLD TOTAL	34.3	100

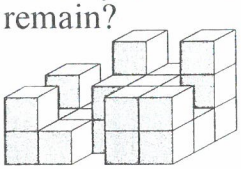
30. [Probability]

Ita can choose an economy, business or first class flight to London, Paris or Rome. How many different outcomes are possible? [Complete the table.]

Outcomes (sample space)	
economy	London
economy	
economy	

31. [Problem Solving 1] *

Some cubes have been removed from an array of 5 × 3 × 3. How many cubes remain?



32. [Problem Solving 2]

A man looking at a photograph says, "Brothers and sisters I have none, but that man's father is my father's son." Who is in the photograph?

33. [Problem Solving 3] *

Three girls, Angela, Lakisha and Jessica, each have one brother and one pet. Lakisha has a bulldog. The horse belongs to the girl whose brother is Paul. If Angela's brother is Ken and the other brother is Stephen, who is Jessica's brother?

MATHS MATE 8

Term 1 - Sheet 2

Name: .....

Due Date: ...../...../.....

Parent's Signature:

QUOTE OF THE WEEK

Jones' Law - The man who can smile when things go wrong has thought of someone he can blame it on.
Rossiter

1. [+ Whole Numbers to 10]

	5	6	10	2	8	11	7	4	9	3
+ 1										

2. [− Whole Numbers to 10]

	19	7	6	10	12	8	4	11	13	5
− 2										

3. [× Whole Numbers to 12]

	4	7	5	2	1	6	9	3	10	8
× 3										

4. [÷ Whole Numbers to 12]

	24	4	16	32	12	28	36	20	40	8
÷ 4										

5. [Large Number +,−] *

$7563 - 3482 =$ ☐

6. [Large Number ×,÷] *

$22\,000 \div 100 =$ ☐

7. [Decimal +,−] *

$25.9 + 30.7 =$ ☐

8. [Decimal ×,÷] *

$0.622 \times 100 =$ ☐

9. [Fraction +,−]

$\frac{11}{13} - \frac{4}{13} =$ ☐

10. [Fraction ×,÷] *

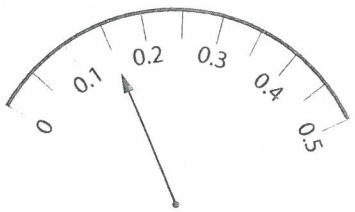
$\frac{3}{7} \times 14 =$ ☐

11. [Percentages] *

What percentage of the distance covered by an Olympic triathlon do athletes cycle if they swim for 3%, run for 20% and cycle the remainder? ☐

12. [Decimals / Fractions / Percents]

What decimal number is shown on this meter?



☐

13. [Integers]

Use < or > to make a true statement.

3 ☐ −4

14. [Rates / Ratios]

Simplify the ratio

40 : 28 ☐ :

15. [Indices / Square Roots]

$9^2 =$ ☐

16. [Order of Operations] *

$5 \times 9 - 6 =$ ☐

17. [Exploring Numbers]

In the number 3.241 which digit is in the hundredths place? ☐

18. [Multiples / Factors / Primes] *

List the common multiples of 3 and 7 up to 70. ☐

19. [Number Patterns]

Complete the pattern:

43, 37, 31, 25, ___ , ___

20. [Expressions]

Simplify $m + m - m + m$ ☐

21. [Substitution] *

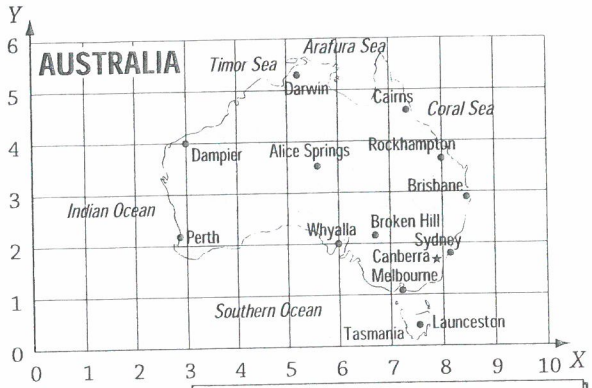
If $r = 3$, find the value of $5r - 8$ ☐

22. [Equations]

$16 - \square = 9$

23. [Coordinates]

Which town is located at the coordinates (6,2)?

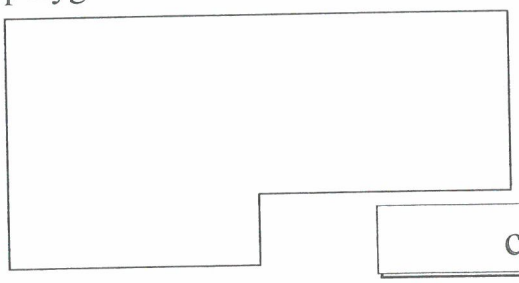


24. [Units of Measurement / Time] *

200 mm = ☐ cm

25. [Perimeter] *

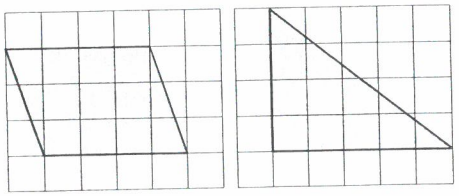
Use a ruler to find the perimeter of the polygon in centimetres.



☐ cm

26. [Area / Volume]

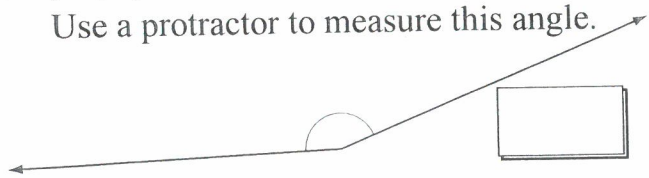
Do the parallelogram and the triangle have the same area?



☐

27. [Shapes]

Use a protractor to measure this angle.



☐

28. [Location / Transformation]

Draw the axes of symmetry of these shapes. Circle the shapes that have vertical symmetry.

29. [Statistics]

Which food type has four times as much protein as brown bread?

Food (50 g)	proteins (g)	fats (g)	carbohydrates (g)
brown bread	4	0.9	24.6
fresh cream	1	11.5	1.5
chocolate	16	15.5	28
boiled egg	6.2	5.7	0.3
strawberry	0.45	0.35	8.6
tuna	12	0.4	0

☐

30. [Probability]

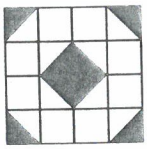
How many different outcomes are possible when choosing a vowel and choosing a card suit (spades, clubs, hearts or diamonds)? [Complete the table.]

Possible outcomes		vowel				
		a	**e**	**i**	**o**	**u**
card suit	**S**	a,S	e,S			
	C	a,C				
	H	a,H				
	D					

☐

31. [Problem Solving 1] *

Caro painted this design in her art class. What is the ratio of the black portion of the design to the white portion?



☐

32. [Problem Solving 2]

Complete the addition table.

+	3	8		
	5			6
		14		
12			17	
				13

33. [Problem Solving 3] *

To buy both the green (G) and blue (B) bikes would cost $1500. To buy the green and red (R) bikes would cost $750. To buy all three bikes would cost $2000. How much does each bike cost?

G = $ B = $ R = $

MATHS MATE 8

Term 1 - Sheet 3

Name: .....

Due Date: ...../...../.....

Parent's Signature:

QUOTE OF THE WEEK

Practise yourself...in little things; and thence proceed to greater.
Epictetus

1. [+ Whole Numbers to 10]

	4	7	2	5	1	10	8	6	9	3
+ 10										

2. [− Whole Numbers to 10]

	6	13	10	7	12	8	5	9	11	14
− 3										

3. [× Whole Numbers to 12]

	5	8	11	6	9	12	10	7	3	4
× 5										

4. [÷ Whole Numbers to 12]

	16	14	24	8	12	22	6	10	20	18
÷ 2										

5. [Large Number +,−] *

$8921 - 3506 =$ ☐

6. [Large Number ×,÷] *

$630\,000 \div 100 =$ ☐

7. [Decimal +,−] *

$3.68 + 4.51 =$ ☐

8. [Decimal ×,÷] *

$60.5 \times 1000 =$ ☐

9. [Fraction +,−] *

$\frac{4}{5} + \frac{3}{5} =$ ☐

10. [Fraction ×,÷] *

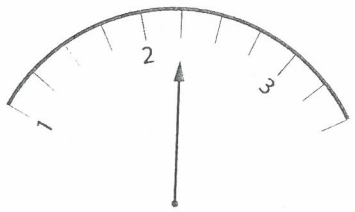
$\frac{2}{5} \times 5 =$ ☐

11. [Percentages] *

Eighteen-carat rose gold is 75% gold, 9% silver and the rest copper. What percentage is copper? ☐

12. [Decimals / Fractions / Percents]

What decimal number is shown on this meter?



☐

13. [Integers]

Use < or > to make a true statement.

-7 ☐ -5

14. [Rates / Ratios]

Simplify the ratio

2 kg : 8 kg ☐ : ☐

15. [Indices / Square Roots]

$0^2 =$ ☐

16. [Order of Operations] *

$56 \div 7 + 1 =$ ☐

17. [Exploring Numbers]

What is the value of the underlined digit in the number $0.5\underline{5}$?

☐

18. [Multiples / Factors / Primes] *

What is the lowest common multiple (LCM) of 5 and 6?

☐

19. [Number Patterns]

Complete the pattern:

2, 2.3, 2.6, 2.9, ☐, ☐

20. [Expressions]

Simplify

$hi + hi + hi + hi + hi$

☐

21. [Substitution] *

If $t = 4$,
find the value of $\frac{t+6}{5}$

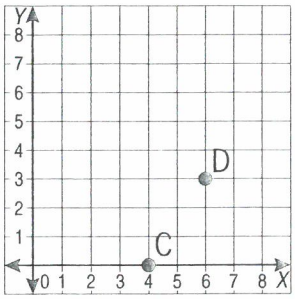
☐

22. [Equations]

$17 +$ ☐ $= 26$

23. [Coordinates]

What are the coordinates of the points C and D on this Cartesian plane?



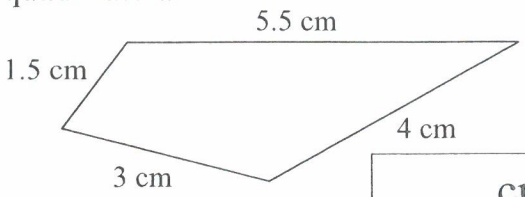
C(,) D(,)

24. [Units of Measurement / Time] *

46 cm = ____ mm

25. [Perimeter] *

Calculate the perimeter of the quadrilateral.

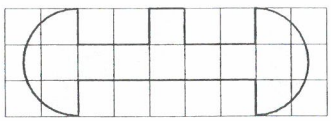


____ cm

26. [Area / Volume] *

Find the area of the shaded shape.

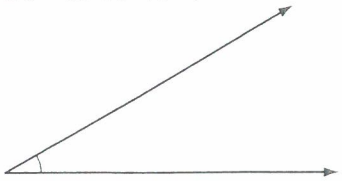
[Round to the nearest whole number.]



____ sq. units

27. [Shapes]

Without measuring, would you estimate that the size of this angle is closer to 30° or to 45°?



____

28. [Location / Transformation]

Draw the axes of symmetry of these shapes. Circle the shapes that have horizontal symmetry.

29. [Statistics]

Of the animals that live for 15 years, which has the lowest heart rate?

Creature	Weight grams	Heart Rate beats/min	Longevity years
Human	90 000	60	70
Cat	2000	150	15
Dog	5000	90	15
Chicken	1500	275	15
Horse	1 200 000	44	40
Cow	800 000	65	22
Pig	150 000	70	25

____

30. [Probability]

How many different outcomes are possible when rolling two dice?

[Complete the table.]

Possible outcomes	Die 1					
Die 2	1	2	3	4	5	6
1	1,1	1,2				
2	2,1					
3	3,1					
4						
5						
6						

____

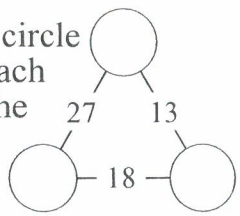
31. [Problem Solving 1]

By moving 3 matches to new positions, change the diagram so that there are 4 squares.

____

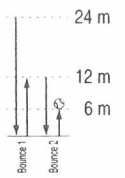
32. [Problem Solving 2] *

Enter a number in each circle so that the number on each line equals the sum of the numbers at each end.



33. [Problem Solving 3] *

A ball is dropped from a height of 24 m. With each bounce, the ball reaches a height that is half the height of the previous bounce. How far has the ball travelled by the time it comes to rest? [Hint: The answer is a whole number.]



After 2 bounces
24 + 12 + 12 + 6 = 54 m

____ m

Assignment 21 - Time 1

1.

1 minute =	seconds	1 hour =	minutes
1 hour =	seconds	1 day =	hours
1 week =	hours	1 week =	days
1 year =	days	1 year =	weeks
1 decade =	years	1 fortnight =	days

2.

12 minutes =	seconds	4 hours =	minutes
6 minutes 18 seconds =	seconds	8 hours 15 minutes =	minutes
4 days =	hours	3 weeks 5 days =	days
5 weeks 13 days 24 hours =	days	3 years =	days

3. *Convert these 24-hour times to 12-hour times.*

(a) 2100 = _____ (b) 1325 = _____ (c) 1515 = _____
(d) 2240 = _____ (e) 1605 = _____ (f) 1451 = _____
(g) 1945 = _____ (h) 0010 = _____

4. *Convert these 12-hour times to 24-hour times.*

(a) 6.00 p.m. = _____ (b) 12.00 p.m. = _____ (c) 7.00 a.m. = _____
(d) 12.00 a.m. = _____ (e) 11.55 p.m. = _____ (f) 11.05 a.m. = _____

5. *If it is 10.30p.m., how many hours and minutes is it until:*

(a) Midnight = _____ (b) 11:05 p.m. = _____ (c) 6:00 a.m. = _____
(d) Noon = _____ (e) 4:45 a.m. = _____ (f) 2:15 p.m. = _____

6. *How long ago did the following occur?*

(a) *Your birthday.* _____
(b) *The beginning of World War 2 in 1939.* _____
(c) *The death of Elvis Presley in 1977.* _____
(d) *The crowning of Elizabeth II in 1953.* _____
(e) *Cyclone Tracy hits Darwin in 1974.* _____
(f) *The Melbourne Olympic Games in 1956.* _____

7. *Construct a timeline to show:*

(a) *The beginning of the Ancient Egyptian civilisation in 2 600 BC;*
(b) *The end of the Ancient Egyptian civilisation in 1 085 BC;*
(c) *The beginning of the Ancient Sumerian civilisation in 3 500 BC;*
(d) *The end of the Ancient Sumerian civilisation in 400 BC;*
(e) *Stone inscriptions dated in 3 600 BC;*
(f) *European settlement in Australia in 1788; and*
(g) *Charles Darwin's 'On the Origin of Species', published in 1859.*

Assignment 22 - Time 2

1. Matthew spent 2 hours 20 minutes at football training on Monday and Wednesday, 90 minutes swimming on Thursday and 1 hour 15 minutes at the gym on Sunday.
   (a) How long did he spend on exercise in one week? _____
   (b) If he played a game of football between 2.20 p.m. and 5.00 p.m. on Saturday, how much time was involved in sport and exercise altogether? _____
   (c) If Matthew played 18 games of football in a season and kept up his training and exercise programme, how much time would be devoted to his sport throughout the season? _____

2. If Jade left Perth at 3.15 p.m. and arrived in Geraldton at 7.35 p.m., how long did the trip take? _____
   If she travelled at an average speed of 110 km/h how far did she travel? _____

3. Amanda had planned a flight from Melbourne to Perth.
   (a) If she left her house at 1.30 p.m. and arrived at the airport at 2.18 p.m., how long did she take to get there? _____
   (b) Although her flight was due to leave at 3.30 p.m., it was delayed for 42 minutes. What time did the flight actually depart? _____
   (c) If she arrived in Perth at 5.52 p.m. how long was the flight? _____ (Melbourne to Perth has a two hour time difference.)
   (d) If the plane flew at 650 km/h what distance was travelled? _____

4. Two friends set out on a trip at 6.15 a.m. on Monday morning and arrived at their destination on Thursday at 1.30 p.m.. How long did their trip take? _____

5. A group of softball players set out from Sydney at 7.45 a.m. to travel to a finals game. They stopped for lunch at 12.30 p.m.. If their bus was averaging 100 km/h, how far did they travel? _____ How far did they still have to go if the whole trip was 983 km? _____

6. Use the scale to calculate the distances between the following places. If the average speed is 100 km/h, calculate the total time taken to travel between these places. (As the crow flies.)

Scale: 1 cm = 350 km

Place	Distance	Time
Perth to Alice Springs		
Sydney to Brisbane		
Lake Eyre to Cairns		
Adelaide to Darwin		

Assignment 23 - Calendars and Timetables

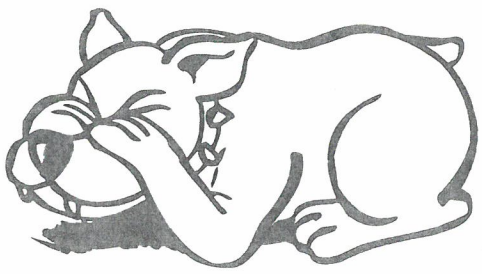
1. What will be the date 3 weeks after the 8th August? _____
2. What will be the date 7 weeks before June 1st? _____
3. How many days before the 18th of May is the 6th of April? _____
4. What will be the date 4 weeks and 4 days after October 11th? _____
5. What will be the date 8 weeks and 6 days after Christmas Day? _____
6. If Jarrod's birthday is on the 14th of January and Jeff's is on the 14th of April, how much older is Jarrod? _____
7. How many weeks are there between Anzac Day and Christmas Day? _____
8. How many days are there altogether in the first half of the year? _____
9. How many days are there in the winter months? _____
10. Wendy left for her holiday on August 5th and returned on the September 3rd. For how many days was she on holiday? _____

Complete the following using the television timetable shown.

6.00	Morning News
6.30	Cartoons
7.30	Play Time
8.15	The Book Show
8.30	News and Weather
9.00	Sports Special - Tennis
12.00	Midday Movie
1.30	Game Show
2.00	Cooking Program
2.30	News Brief
2.45	Cartoons
3.00	Quiz Program
3.30	News Brief
3.40	Home Show
4.15	Cartoons
5.00	The Sports Scene
6.00	News and Weather
7.00	Sci-Fi Special
8.25	Movie Special
10.45	Close

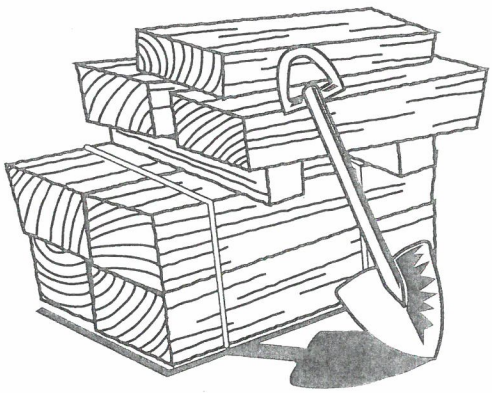
11. What time did the cooking program begin? _____
12. How many hours viewing does this timetable show? _____
13. If you watched TV from 8.20 a.m. until the end of the tennis, how long would you have been watching? _____
14. How much time is allocated to news? _____
15. How much time is allocated to cartoons? _____
16. Which movie was longer? _____
17. How long did it run for? _____
18. How much time was allocated to sports? _____

19. Calculate the number of hours and minutes you spend watching TV each week .

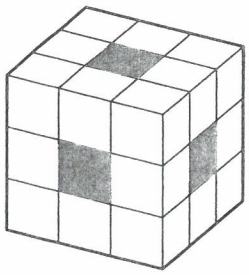


SURFACE AREA

1. Some 2 m long sleepers with 10 cm x 20 cm rectangular ends are going to be stacked to form a set of garden stairs with 5 steps. If all the exposed sides except those on the bottom and on the higher end set into the garden are painted with wood preserver, what area will be painted?



2. When the builder put the steps together, he decided to paint all the outside surfaces before he assembled the steps in order to prolong the life of the stairs. What area did he actually paint?



3. Imagine 1 cm^3 cubes stacked to make a 3 x 3 x 3 cube. Remove one cube from the centre of each face. If all of the exposed faces are painted red, what is the surface area of the shape that has been painted?

4. Would the surface area to be painted change if there was a hole through the centre of the cube?

5. (a) Now imagine a 4 x 4 x 4 cube. Remove a square of cubes from the centre of each face. What would be the surface area of this shape?

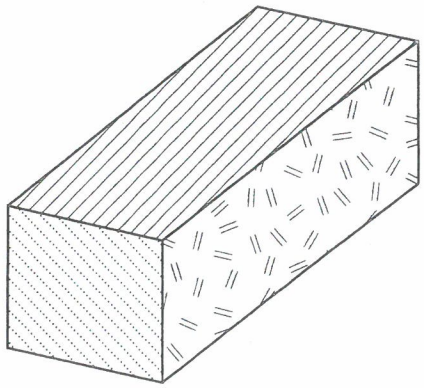
   (b) How would the surface area change if there was a hole in the centre of this cube?

6. If you had a 5 x 5 x 5 cube and removed a square of cubes from the centre of each face, what surface area could there be? (There are 2 possibilities.)

7. How would the surface area change if there was a hole in the centre of the cube? (Consider all the possibilities.)

VOLUME AND SURFACE AREA

1. A number of 1 cm^3 cubes are put together to make a right rectangular prism with each edge greater than 1 cm. The six faces of the prism are painted green. When the small cubes are taken apart, 105 have no paint on them.



(a) Where would these cubes occur?

_____

_____

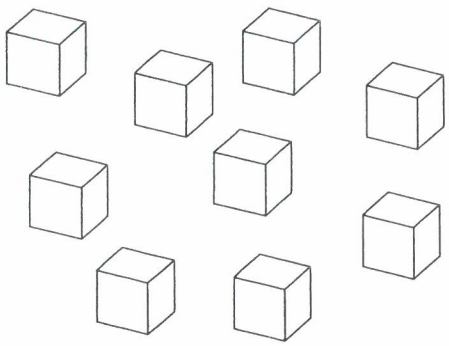
(b) What shape would they form?

_____

Use this information to find:

(c) the volume of the whole prism _____

(d) the surface area of the whole prism. _____



2. A large number of cubes with 1 cm sides are put together to make another right rectangular prism with edges greater than 1 cm. After the six faces of the prism are painted green and then taken apart, 363 of the small cubes have not been painted.

What is the volume and surface area of the whole prism?

_____

_____

3. Some cubes with 2 cm sides are put together to make a right rectangular prism. The six faces of the prism are painted blue. When the small cubes are taken apart, 60 have no paint on them.

(a) In which ways could 60 cubes form the internal prism?

_____

_____

(b) What would be the volume and surface area of the whole prism for each possibility?

_____

_____

_____

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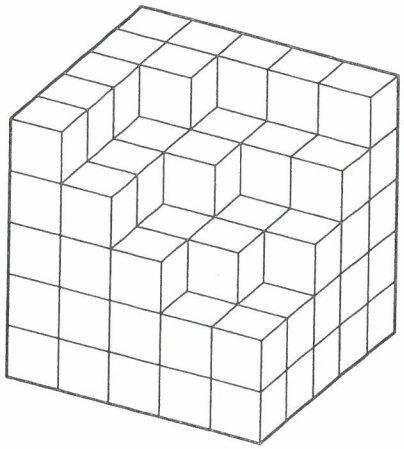
SURFACE AREA AND VOLUME

1. Some cubes with 2 cm sides have been arranged to make this shape.



(a) What is the surface area of the shape?

_____

(b) What is the volume of the shape?

_____

(c) If you add one more block to the upper surface of every block, what will be the new surface area and volume?

_____

6	6	4	2
7	6	4	
6	5	3	
5	4		

2. Here is a plan of a shape made from a number of cubes with 3 cm sides. The squares show where the cubes are and the numbers show how many cubes at each place.

(a) Get the number of cubes you will need and make the shape. Use this model to work out the surface area and volume of the shape.

_____

(b) Work out the surface area and volume of the shapes shown by these plans. The size of the cubes is written underneath each plan.

(i)

5	4	3	2	1
4	6	6	4	2
3	2	1	1	1

2 cm^3 cubes

(ii)

6	3		
5	3		
5	3		
4	3	2	1
4	3	2	1

3 cm^3 cubes

(iii)

5	3	2	4
3	5	4	2
2	4	5	3
4	2	3	5

4 cm^3 cubes

_____ _____ _____

(c) Can you work out the volume and surface area directly from the plan? (You may need to draw the views from each side and the top to find the surface area.)

(d) Make a shape of your own. Then make a plan for it and decide on the dimensions of the cubes. Ask a friend to work out the surface area and volume. Does your friend need to make the shape?

MAGIC SQUARES

Magic squares have numbers that all add to the same total. All rows, columns and diagonals add to the same total.

Complete these magic squares. Remember, all rows, columns and diagonals must add to the same number.

This magic square has a magic number of _____.

30		12	
	48		18
		27	36
24	39		9

21	18		30
16		22	17
	13		23
19		27	

Magic number: _____

24	21		32
19	31		
30		23	26
22		29	

Magic number: _____

	56	53	66
54		60	55
	51	58	
57		63	

Magic number: _____

	39		49
37	48		38
		41	44
40		46	35

Magic number: _____

20		14	
	27		16
26		19	22
18	23		13

Magic number: _____

	86		98
	97	90	
96	81		91
87	92	95	

Magic number: _____

24	21		
19	33	25	20
30		23	
	27		17

Magic number: _____

72		66	82
67	81		68
80		71	
			65

Magic number: _____

22		16	
	28		18
27	14	21	24
		26	15

Magic number: _____

Physical Education ACTIVITY LOG

TASK 1: Physical Activity Log

Use this activity log to track your physical activity points for 2 weeks.
If you can get your parents involved, you will get double points.
Mike Morris Challenge: https://www.youtube.com/channel/UCwD5G06s9Dpz-VjTi7k_okw/videos

Week 1:

Day	Activity 1	Activity 2	Activity 3	Total
Sample Day	Active Outside 60 Mins (30pts)	Mike Morris Challenge 15 Mins (10 pts)	Drink 7 cups of water 10 pts	50 points or 100 points (with parent)
Example	Chopping Wood with dad (60 points)	Soccer Basketball Record: 8/15 goals(10pts)	Done (10 points)	80 pts
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6+7				

Week 2:

Day	Activity 1	Activity 2	Activity 3	Total
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				

TASK 2: Create a Ninja Warrior obstacle course.

Use anything that you can find in your backyard and create an obstacle course that can be 100-200m long or take 1-2 minutes to complete.

Example: https://www.youtube.com/watch?v=TXer2Oxu37Y&feature=youtu.be

TASK 3: Workout Challenge

SPELL YOUR NAME
DO THE WORKOUT **EVERY DAY**

A: 10 PUSH UPS
B: 1K JOG
C: 10 SQUAT JUMPS
D: 20 BURPEES
E: 10 SQUATS
F: 20 STAR JUMPS
G: 20 LUNGES
H: 1 MIN SKIPPING
I: 45 SEC PLANK
J: 3 SETS OF STAIRS
K: 10 BURPEES
L: 20 SQUATS
M: 2 MIN PLANK
N: 5 SETS OF STAIRS
O: 20 LEG RAISES
P: 1 MIN PLANK
Q: 30 STAR JUMPS
R: 2 MIN SKIPPING
S: 20 BURPEES
T: 30 SEC PLANK
U: 15 SQUATS
V: 15 PUSH UPS
W: 20 SIT UPS
X: 10 LUNGES
Y: 20 SQUAT JUMPS
Z: 2 MIN PLANK

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Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6+7				

Week 2:

Day	Activity 1	Activity 2	Activity 3	Total
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				

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TASK 3: Workout Challenge

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DO THE WORKOUT EVERY DAY

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B: 1K JOG
C: 10 SQUAT JUMPS
D: 20 BURPEES
E: 10 SQUATS
F: 20 STAR JUMPS
G: 20 LUNGES
H: 1 MIN SKIPPING
I: 45 SEC PLANK
J: 3 SETS OF STAIRS
K: 10 BURPEES
L: 20 SQUATS
M: 2 MIN PLANK
N: 5 SETS OF STAIRS
O: 20 LEG RAISES
P: 1 MIN PLANK
Q: 30 STAR JUMPS
R: 2 MIN SKIPPING
S: 20 BURPEES
T: 30 SEC PLANK
U: 15 SQUATS
V: 15 PUSH UPS
W: 20 SIT UPS
X: 10 LUNGES
Y: 20 SQUAT JUMPS
Z: 2 MIN PLANK

English Year 8 work pack- Helicopter Man activities

You should COMPLETE one activity each English session.

Activities are organised in groups of difficulty. Choose the activities that best suit your level of understanding

Building

1. WRITE the epilogue (a scene after the ending) for the story.
2. ILLUSTRATE 3 important scenes.
3. DESIGN a new front cover for the book.
4. WRITE a scene from another character's perspective (not his dad).
5. WRITE a book review on the novel.
6. CREATE a PowerPoint that reflects 10 important settings in the novel and explain each choice.

Medium

7. BUILD a mouse castle.
8. COMPLETE a collage of a scene from the book.
9. CREATE a PowerPoint that reflects 10 important settings in the novel and explain each choice.
10. VISIT to the NGV (National Gallery of Victoria) website. Find paintings that best represent Pete, his dad and his mum. Explain your choices
11. RESEARCH home schooling. What is it? Why do some families choose it? Identify the advantages and disadvantages. Write down your answers.
12. .COMPLETE a VENN diagram comparing Pete's time with the Cowpers to life with his dad.

Challenging

13. SELECT a chapter and depict it as a comic strip.
14. WRITE an acrostic poem based on one of the characters or places in the novel
15. RESEARCH anxiety, depression or schizophrenia. Produce a poster identifying: the symptoms, impact, diagnosis, treatment and support.
16. IMAGINE that you are Pete's dad. Write 3 diary entries reflecting his experiences over the course of the novel.
17. IMAGINE you are Pete's mum. Write the letter to your husband.
18. SCRIPT an important conversation in the novel.