

KINGS SCHOOLS-KABOWA

P.6 Science - Brief Notes & Revision questions

CIRCULATORY SYSTEM

This is a group of body organs that work together to transport blood throughout the body parts.

The circulatory system is made up of three parts; the heart, the blood vessels and the blood.

THE HEART

The heart is a muscular organ which pumps blood to all body parts.

The heart is made up of cardiac muscles

The heart is enclosed in a tough membrane called Pericardium

This produces a lubricating fluid which reduces friction.

The normal heart beat of a person is 72 times per minute but it can go beyond if there is an excitement, fear etc

The heart is divided into 4 chambers namely;

- the upper chambers each called auricle or atrium while the lower chambers are called ventricles. The heart is separated into two sides is the right side and the left side. The thick muscle that separates the heart into two sides is called septum.

Refer to the text book.

THE STRUCTURE OF THE HUMAN HEART.

FUNCTIONS OF PART OF THE HEART

- a) Vena cava; receives deoxygenated blood from other parts of the body to the heart.
- b) Pulmonary artery: transports deoxygenated blood to the lungs to drop carbon dioxide and pick oxygen.
- c) Pulmonary vein: carries oxygenated blood from the lungs to the heart to be pumped to all body parts.
- d) Aorta: transports oxygenated blood from the heart to all body parts.
- e) Valves: prevent the back flow of blood.
- f) Septum; separates the heart into two sides ie left side and right side.

NB: The main function of the mammalian heart is to receive and pump blood to all parts of the body.

HOW THE HEART WORKS

Oxygenated blood from the lungs enters the heart through pulmonary vein on the left auricle and deoxygenated blood from body tissue enters the right auricle through vena cava.

The left ventricle is thicker and muscular because it pumps blood for a long distance to all body parts through aorta.

The right ventricle pumps blood through pulmonary artery to the lungs.

The muscles of the auricles and ventricles are supplied with oxygenated blood by the coronary arteries which branch from the aorta.

TYPES OF BLOOD VESSELS

There are three blood vessels namely arteries, veins and capillaries.

Arteries

- They transport blood away from the heart.
- They are thick walled, muscular and elastic
- They have a narrow lumen.
- They carry blood with high pressure.

STRUCTURE OF AN ARTERY

Veins

- They carry blood towards the heart.
- They are thin walled with a wide lumen
- They carry blood with low pressure

STRUCTURE OF A VEIN

Differences between veins and arteries

ARTERIES

- Have a narrow lumen
- They are thick walled
- Don't have valves
-
- Carry blood away from the heart
- Carry blood at a high pressure

VEINS

- Have a wide lumen
- They are thin walled
- Have valves to prevent back
-
- carry blood towards the
- carry blood at a low pressure

Capillaries

These are tiny blood vessels found in every living tissues of our body.

They connect arteries to veins

Our bodies have more capillaries than veins.

NOTE: In mammals there is double circulation of blood which occurs through two ways; -

- i) **Systemic circulation:** Where blood is pumped to all parts of the body by the left ventricle. (except the lungs)
- ii) **Pulmonary circulation:** Is the circulation of blood to and from the lungs.

Structure of capillaries.

NB:

- Oxygenated blood is bright red while de-oxygenated blood is dark red.
- All arteries join to form the aorta which is the biggest artery
- All veins join to form the vena cava which is the biggest vein
- The smallest vein is called venule
- The smallest artery is called arteriole

EXERCISE

1. Name the membrane in which the heart is enclosed?
 2. Identify the artery that transports deoxygenated blood to the lungs.
 3. Point out the four chambers of the heart.
 4. Give one functional difference between the pulmonary artery and the pulmonary vein.
 5. Why is the left part of the heart thicker than the right part?
 6. State any one smallest blood vessels in the body.
 7. Identify the smallest blood vessels in the body
 8. Name the biggest ventricles of the heart adapted for its function?
 9. How is right ventricle of the heart adapted to its function?
 10. Which type of blood is transported by the arteries?
- a)

BLOOD

Blood is a red fluid (liquid) that flows round the body.

COMPONENTS OF BLOOD

It consists of the following components.

- red blood cells (erythrocytes)
- white blood cells (leucocytes)
- platelets (thrombocytes)
- plasma (the liquid part)

In a normal health person, there are about 5-6 liters.

Red blood cells transport oxygen

They are red because of Hemoglobin (a protein with iron in its molecule)

Hemoglobin is a red pigment which easily combines with oxygen to form oxy-hemoglobin

Red cells are made in the red bone marrow of short bones e.g. sternum, scapula, ribs, vertebra and pelvis

Red blood cells don't have nucleus.

STRUCTURE OF A RED BLOOD CELL

WHITE BLOOD CELLS

These are larger than red blood cells.

They have a nucleus but no Hemoglobin in their cytoplasm.

They are made in the white bone marrow, lymph nodes and the spleen.

The main function of white blood cells is to defend the body against diseases.

How are white blood cells adapted for their function?

- Engulfing and digesting the germs before they produce symptoms.
- By producing antibodies against germs
- By producing antigens against the germs.

NB: White blood cells are affected by HIV/AIDS.

Structure of a white blood cell.

PLASMA

This is a yellow pale liquid part of blood.

It consists of blood proteins, dissolved food, mineral salts, urea, carbon dioxide, hormones.

FUNCTIONS OF PLASMA

- It transports digested food, mineral salts, urea, carbon dioxide, hormones.
- It distributes heat to all body parts.

GENERAL FUNCTIONS OF BLOOD;

- Blood carries digested food and oxygen to all body parts.
- It carries away waste products from body tissues to where they are removed out of the body, e.g. urea, uric acid, sweat, excess mineral salts, carbon dioxide from body tissues to the lungs.
- It defends the body against disease infections
- It distributes heat to all parts of the body or it regulates body temperature.
- It carries hormones which help the body to work properly.

BLOOD GROUPS

Blood transfusion is the transfer of screened blood from one person to another as long as the blood groups agree.

There are four blood groups namely; A, B, AB and O

Donor- Is a person who gives out blood.

Recipient / receiver- is a person who receives the blood.

These blood groups were first discovered by an Austrian scientist called Karl Landsteiner in 1890.

- a person, whose blood group is AB, can receive blood from any person of any blood group. Therefore, he is called a universal recipient.
- A person whose blood group is 'O' can give blood to any person of any blood group. Therefore, he is called a universal donor. BUT a universal donor must receive blood from a person with group 'O' only.

Today because of HIV virus or AIDS, all donated blood is first screened before transfusion.

EXERCISE

1. What is blood?
2. Name any three components of blood.
3. State any three uses of blood in the body.
4. How are the following components of blood in the body.
 - a) White blood cells
 - b) Red blood cells
 - c) Platelets
5. Define the blood transfusion
6. Explain the meaning of the following terms;

- a) Donor b) Recipient
7. Name the scientist who discovered blood groups
 8. Who is a universal donor?
 9. Who is a universal recipient?
 10. How is blood transfusion important to casualties?

BLOOD CIRCULATION

Blood circulation is the act of blood moving round the body.

Blood circulation was first discovered by Sir William Harvey

Doctors listen for the heart beat and sounds produced during breathing using an instrument called Stethoscope. They put it on the chest of the sick person.

Doctors also use an instrument called Sphygmomanometer to measure blood pressure.

It is normally tied around one's hand and pumped.

ORGANS INVOLVED IN BLOOD CIRCULATION

- heart - Brain - Lungs
- Liver - Kidney

Diagram showing the human circulatory system

DISEASES OF CIRCULATORY SYSTEM

Diseases of the heart

- High blood pressure
- Heart attacks

Non communicable diseases-

- | | |
|---------------------------|------------------------------------|
| - Blood cancer (leukemia) | - heart attack (heart failure) |
| - Anemia | - Blood clot (coronary thrombosis) |
| - Hemophilia | - Heart stroke |
| - Sickle cell anemia | |

Communicable diseases

- HIV/AIDS

Effect of HIV/AIDS

a) Individual

- Loss of weight - Stress - Ill health
- Loss of appetite - Loss of employment

b) Family

- Loss of income
- Mistrust among family members
- neglect of sick members

c) Community

- Loss of important people
- Poverty

How to maintain proper working of circulatory and respiratory systems?

- The heart muscles grow stronger and longer
- The heart delivers more blood to the body muscles.
- They reduce the level of fat in the body to prevent obesity
- They improve blood supply to the heart muscles
- The risk of heart diseases and high pressure is reduced
- Ligaments and tendons become stronger and reduce chances of getting injured.
- Joints become more flexible.
- Digestion of food is carried out quickly and easily.

Exercise

1. What is blood circulation?
2. How is blood circulation important in the body?
3. State the uses of the following instrument; -
 - a) Stethoscope b) Sphygmomanometer
4. Identify the blood vessel that carries blood from the ileum to the liver.
5. Give one reason why blood goes to the lungs before it goes to all parts of the body.

6. Write one disease and disorder of the circulatory system.
7. Which component of blood is destroyed by HIV/AIDS?
8. State any two signs of HIV/AIDS.
9. Mention any two importance of physical exercises to our body.

A drug is any chemical substance which when taken causes a desired effect on the body.

Drug dependence is a condition whereby a person takes drugs regularly and eventually get used to them so that he cannot perform any work without taking them.

Drug addiction is a strong desire or compulsion that makes one uncomfortable without using the drug.

Drug addiction is caused by prolonged use of a drug.

TYPES OF DRUGS

a) Drug of dependence (narcotic drugs)

They are drugs, which cause addiction after prolonged use.

Narcotic drugs or sedative drugs are drugs that relieve pain and induce sleep.

Examples of narcotic drug; -

a) Alcohol b) Valium c) Librium d) Panadol

Stimulants these are drugs that increase the mental activity of the brain.

Examples

a) Alcohol b) jet fuel c) Mandrax (nicotine) d) Cocaine

e) Tobacco (marijuana/bhang/njaga) f) Miraa (khat, marungi)

g) Sleeping pills like valium, and painkillers such as narcotics.

Why people abuse drugs?

- To relax and pass time
- Due to peer group pressure (to keep or to be like their friends / to fit in a group)
- To feel warm
- To concentrate on their work
- To overcome fear
- To stay awake for a long time (to be insomniac)
- To get sleep and forget their worries.
- For cultural values or beliefs e.g. taking alcohol to show hospitality to visitors or during cultural functions like marriage.
- To enhance excitement to the body and feeling of pleasure.

Dangers of drug abuse to individuals

- Brain damage
- Self-neglect and job neglect
- Inability to get sleep. (insomnia)

To the family

- violence
- poverty in the family
- most children of drug addicts become delinquents
- A delinquent is a child who commits an act punishable by law.
- Loss of family respect.

Drug storage

- keep drugs out of reach of children
- keep drugs in a cool clean dry place
- keep drugs in a clean container then seal to avoid contamination
- keep liquid drugs in cold chains

Dangers of buying drugs from shops and vendors

- they might be expired
- they are not well prescribed
- some drug might be fake
- they can be contaminated due to poor storage

Drug prescription

This is a written instruction by a health work on how to use a certain drug.

Reasons why drugs are prescribed

- prevents over dose
- prevents under dose
- prevents drug poisoning

Over dose

- This is when a patient takes more medicine than the amount prescribed by the health worker.
- It makes the body resistant to drugs.

Drug misuse

Drug misuse is the wrong use of a drug. Drug misuse results from misinterpretation of prescriptions or using un prescribed drugs, which lead to wrong usage.

Drug abuse

Drug abuse is the use of drug in a way that is harmful to the body.

Using a drug for a wrong purpose is also drug abuse

Drug abuse often has dangerous effect on the body and it leads to drug addiction or drug dependence.

Expiry date

This is the date by which the drug is no longer useful

Manufactured date

This is the date at which the drug is made.

ALCOHOL

Alcohol is a chemical substance that makes a person drunk when taken.

Reasons why people drink alcohol

- to pass time - to fit in the groups - to be confident - to be happy
- to forget their problems for a while - to void frustration
- because they are sad - to improve on their mental performance
- to increase on their sexual performance

Types of alcohol

Methyl alcohol (methanol)

Dangerous alcohol that leads to death

Ethyl alcohol (ethanol)

A poisonous addictive alcohol found in most alcoholic drinks e.g. whisks, beers, spirits

Examples of alcoholic drinks in Uganda

tonto, waragi, kwete, malwa, wine, beer, omuramba , munanasi , mokomboti etc

Exercise

1. What is a drug?
2. Why is alcohol called a drug?
3. Define the following terms;
 - a) Drug abuse
 - b) Drug dependence
4. Give two examples of drugs that are commonly abused
5. What is alcohol?
6. Give any three reasons why people take alcohol.
7. Write short notes about the following;
 - a) Drug abuse
 - b) Drug misuse
8. What is drug prescription?
9. State the importance of drug prescription.

Methods of manufacturing alcohol

Fermentation method

This is a process of turning sugar mixed with yeast into alcohol.

Yeast acts as a fungus (decomposer)

Yeast contains an enzyme called zymase that speeds up fermentation method.

Carbon dioxide is produced during fermentation.

Distillation method

Is the process by which the fermented alcohol is boiled to evaporate and condensed to form pure alcohol. (distillate)

Diagram showing distillation method

There are two physical processes involved in distillation method

i.e. Evaporation and condensation

cold water condenses the vaporized alcohol into liquid alcohol.

Coiled delivery tube increases surface area for condensation passes vaporized alcohol into the container as distillate.

Uses of alcohol

- It is used as a drink on some social and cultural functions
- It is used in thermometers
- It is used in sterilizing medical equipment
- It is can be sold to provide income.
- It is used as disinfectant to clean wounds and kill germs.
- Used to mix cosmetics and medicines
- Used in making soap.

Alcoholism

Alcoholism is condition where a person totally depends on alcohol.

Factors that lead to alcoholism

- idleness -social environment -frustration -peer pressure
- desire to pass time with friends. -family background and social environment

Immediate effects of drinking alcohol

- loss of body balance -vomiting -forgetfulness

- the eyes turn red -urinating on oneself -smelling alcohol
- loss of teeth or limbs due to accident.

Long term effects of alcoholism to an individual

- brain damage -self neglect -kidney failure -poverty
- unemployment -high blood pressure -stomach / peptic ulcers

Effects to the family

- family neglect -violence in the family -the children of the drunkards gets spoilt

Effects to the community

- high crime rate -high level of unemployment -increased road accidents

Life skills to avoid/overcome alcoholism

- avoid groups of habitual drunkards
- engage in useful activities during free time
- take good advice from elders and religious leaders
- adults should avoid exposing young children to alcohol
- never take alcohol to solve a problem instead it will become worse.
- never believe in advertisements that praise alcohol as a good drink.

Uganda laws on alcohol

- children should not drink alcohol
- people who sell alcohol should be properly licensed and should maintain certain standards of hygiene /sanitation
- no driving while drunk
- home distillation of alcohol is forbidden
- public places sellign alcohol shouldn't operate transnight

Exercise

1. What is alcohol?
2. Give two reasons why people drink alcohol.
3. Mention the two methods of making alcohol.
4. Give two types of alcohol.
5. State the effects of alcohol to the following;-
 - a) an individual
 - b) family
 - c) community
6. Write any factors that may lead to alcoholism.
7. Identify one law that protects a p.6 child from alcoholism

SMOKING

Smoking is the inhalation of tobacco smoke

Smoking is the taking in of smoke containing tobacco.

Types of smoking

Active smoking is when someone inhales smoke directly from a cigarette.

An active smoker is a person that inhales tobacco smoke from a cigarette or pipe.

Chewing tobacco leaves or sniffing tobacco powder in the nose is also a form of active smoking.

Passive smoking

Passive smoking is a condition where a nonsmoker inhales smoke from a cigarette of an active smoker.

A passive smoker is a person that inhales tobacco smoke from an active smoker

NB: Both active and passive smokers get terrible consequences.

Ways used by people to take tobacco

- smoking tobacco -sniffing tobacco through nostrils - chewing tobacco

Reasons why people smoke

- to relax and feel at ease
- people smoke to feel warm
- people smoke due to peer influence/pressure from friends.
- to concentrate on what they are doing
- to pass or kill time
- people smoke because they admire those who smoke (elders or leaders) i.e. to feel or look mature and sophisticated.
- people smoke of attractive and colourful tobacco advertisements.

Poisonous substances found in tobacco.

NB: Tobacco contains dangerous / poisonous chemical (drugs)

Nicotine, tar and carbon monoxide

i) Nicotine is addictive and once one starts taking it, becomes difficult for one to stop causing addiction.

ii) Tar is a sticky substance that causes lung cancer

Tobacco smoke also contains a poisonous gas called carbon monoxide

Effects of smoking to an individual

- smoking causes respiratory diseases like lung cancer, bronchitis and emphysema
- Smoking leads to cancer of the lips, mouth and throat.
- People who smoke feel irritable, unhappy and depressed if they have not smoked.
- Smoking causes coronary heart diseases. (heart attack)
- Smoking causes or worsens peptic ulcers.
- Smoking causes the teeth to become brown or yellow the lips and the hands darken
- The clothes and breath of a smoker smell tobacco smoke
- Smoking leads to loss of appetite.
- Smoking lowers one's libido for sex
- Smoking in pregnant women can cause abortion and premature births, low birth weight or still births.

Dangers of smokers to non -smokers

- Passive smokers develop the same diseases or health problems got by an active smoker.
- Children may copy smoking habits from their parents or elders
- Poor provision of basic needs to the family members
- A smoker may not meet his family needs because money is spent on buying cigarettes or tobacco.
- It leads to respiratory diseases.

Life skills to safeguard against smoking

- Avoid the company of people who smoke
- Always involve yourself in activities like games and sports during your free time
- Learn more facts about smoking from health workers
- Report your friends who smoke to the teacher or their parents
- Never allow anybody to convince you to smoke and never waste your money on buying cigarettes.
- Never try to taste smoking as this can lure you into being addicted to smoking
- If you are a smoker, decide one day never to smoke again and tell your friends about your decision.

Dangers of drugs abuse

a) To the individual;

- Impaired school or job performance leading to dismissal
- Self-neglect making the individual shabby/dirty and lose respect in society
- Loss of appetite resulting in malnourishment, weakness and poor health
- Insomnia This is a person's inability to get sleep without taking drugs
- Intensive sleepiness - Having sleep from time to time
- The persn becomes psychotic i.e. developing irrational fear of being persecuted
- Brain damage leading to madness
- Masochism (desire /tendency to hurt oneself)

To the family /community

- Family neglect leading to poverty in the family and or divorce
- Aggression and violence (fighting, beating children, spouse or other people)
- Criminal or delinquent behavior like stealing, rape and defilement.

Life skills to control /avoid drug abuse and dependence.

- Negative peer pressure resistance.
- Seek out activities to occupy your free time e.g. games and sports, music dance and drama, join academic discussions, join religious or community service groups.
- Attend seminars on health education
- Only use drugs when advised by a health worker
- Parents, families and communities should advise and guide their children (young stars) to avoid drug abuse and dependence
- Government should enforce the Uganda law on drug abuse and dependence.

Essential drugs

Essential drugs are drugs which satisfy people's common health needs when used properly.

Types of essential drugs

Drugs are classified according to their uses;

a) Preventive drugs

These are drugs which are used to prevent diseases

They are called vaccines; Examples include; DPT, BCG, polio vaccines, measles vaccine, Hep B + Hib and TT (tetanus toxoid) vaccine

b) Curative drugs

These are drugs which cure diseases. They contain substances which kill germs in the body in case of any infection. Examples include chloroquine, Quinine, Tetracycline, Primaquine, Mabendazole, cotrimazole etc

c) **Pain killers**- They are drugs that help to either reduce or remove pain from the body. Commonly used pain killers are aspirin, paracetamol, diclofenac etc

d) **Contraceptive**- These are drugs used in family planning to space children or to avoid unwanted pregnancies.

Qualities of essential drugs

- they are effective - they are affordable
- they meet people's health needs - they are prescribed

Manufacture of essential drugs

Essential drugs are manufactured both in the laboratory and traditionally at home

Laboratory manufactured drugs

These are usually made carefully and tested so that their effectiveness is known.

They are well packed and labeled to show;

Name of the drug strength safety warnings, dosage, the date of manufacture and expiry

Examples of laboratory manufactured drugs include aspirin, chloroquine, fansidar etc

Traditionally manufactured drugs

Traditional drugs are made from plants or herbs

Their purity and effectiveness is not known but they continue to be used because of cultural habits or beliefs.

They are usually not packed under clean conditions and so can easily be contaminated.

Exercise

1. What do we call the regular inhalation of tobacco?
2. Give any two types of smoking.
3. Identify two reasons why people smoke.
4. Who is a passive smoker?
5. Name two dangerous chemicals found in tobacco.
6. Mention any two life skills of controlling drug abuse.
7. Name the final liquid collected during distillation method.

THE CIRCULATORY SYSTEM

Complete the table below.

Vena cava	Carries deoxygenated blood from _____ to _____
Pulmonary artery	Carries deoxygenated blood from _____ to _____
Pulmonary vein	Carries oxygenated blood from _____ to _____
Aorta	Carries oxygenated blood from _____ to _____

2. Why do atria have thinner walls than the ventricles?
3. What is the function of the valves found in heart?
4. Name blood vessels that carry blood away from the heart.
5. Why is blood pressure in arteries high?
6. Draw and label
 - i) An artery
 - (ii) A vein
7. Which are the connect blood vessels?
8. Which blood vessels have values have throughout their length?
9. What is meant by systemic circulation of blood in mammals?
10. Mention two ways of increasing the volume of blood in circulation.
11. How are red blood cells adapted to their length?
12. How is the heart adapted to its function of pumping blood?
13. Name the two types of blood in the human body.
14. Which of the above named types of blood is called improve blood?
15. What is the major role of the septum of the heart?
16. On which side of the heart is the tricuspid valve found?
17. What is blood circulation?

18. Where does blood go after leaving the right ventricle?
19. How does HIV affect the circulation?
20. The diagram below shows how blood vessels are connected in the body tissues. Use it to answer the questions about it.
- a. Name the type of blood vessels marked:
- B
- A
- b. Name the function of the blood vessel marked C.
- c. Apart from dropping carbon dioxide, what other activity is connected to blood circulation occurs in the lungs?
21. Below are two blood vessels. Study them carefully and answer the questions that follow.
- a. Name the blood vessels marked:
- Y
- X
- b. How useful are structures marked Z in blood vessels marked Y?
- c. Give any one structure difference between blood vessels X and Y.
22. How is blood carried by the pulmonary vein different from that carried by the pulmonary artery?
- b. Write down any deficiency diseases that affect the functioning of the circulatory system.
- c. As a primary pupil, how can you increase the flow blood in your body?

ALCOHOL, SMOKING AND DRUGS IN THE SOCIETY

1. Name the method of preparing alcohol in which heat is involved.
2. Why is alcohol called a drug?
3. Name the drug that may cause impaired concentration and judgement in drivers leading to road accidents.

4. How does alcohol cause dehydration in an alcohol?
5. Which part of the ear is interfered by too much alcohol in the body?
6. How does living in the environment such as slums lead to alcoholism?
7. Name the fungus that helps in the fermentation of alcohol?
8. Why is alcohol made through the fermentation process having low content?

The diagram below shows a method used to prepare alcohol. Use it to answer questions that follow.

- 9a. Name the processes that take place at A and B
 - (i)A
 - (ii)
- b. Why is the copper tube coiled at B?
- c. Give the scientific name for liquid Q?
10. Give one use of alcohol
 - i) at home
 - ii) in the factory
 - iii) in the hospital
11. Give two effects of alcohol to;
 - a. an individual
 - b. a family
 - c. pregnant woman
 - d. a community
12. Write down the laws governing the sale and production of alcohol in Uganda.

SMOKING

1. What is smoking?
2. Give one type of smoking which does not involve burning.
3. Give the difference between active smoking and passive smoking. It
4. Which chemical in tobacco causes; -
 - a) addiction
 - b) lung cancer
5. Name the poisonous gas present in tobacco smoke.
6. How is the gas named above dangerous to human health?
7. Apart from lung cancer, mention two other diseases caused by smoking tobacco to the user.
8. How does smoking affect pregnant women?
9. State two effects of smoking to an individual.
10. Write down the warning message about smoking.

11. What are essential drugs?
12. Give one example of preventing drug.
13. Mention two characteristics of essential drugs.
14. State two ways essential drugs are manufactured.
15. Give the difference between laboratory drugs and traditional drugs.
16. Write down two examples of essential drugs.
17. Give the meaning of the following terms as used in drug; -
 - a) Drug misuse b) Drug abuse c) Drug addiction
 - d) Drug dependence e) Drugs of dependence.
18. Give two examples of drugs of dependence.
19. Mention two factors that lead to each of the following: -
 - a) Drug addiction b) Drug misuse c) Drug abuse
20. What is drug prescription?
21. Give two reasons why doctors prescribe to the user.

Learners can refer to new edition comprehensive science pupil's book 6.