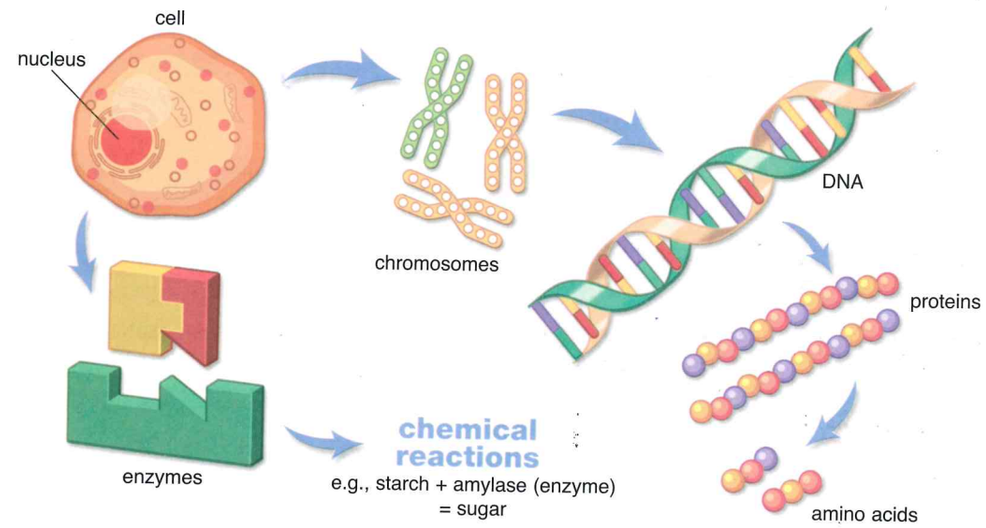
UNIT 14

Cells, organs and systems

CD 2-12

Section 1 *Vocabulary*

A. Read the text and look at the diagram.



All **organisms** or living things are made up of **cells**. All cells in human beings contain a **nucleus**. The nucleus contains **chromosomes**. Every human has 23 pairs of chromosomes. The chromosomes contain **genes**. The genes carry the biological information from parents to children. They carry **inherited features**, like hair and eye color, and also inherited **diseases**. The genes contain **DNA** molecules which are the basis of life. The DNA molecules are made up of **proteins** which, in turn, are **composed** of **amino acids**.

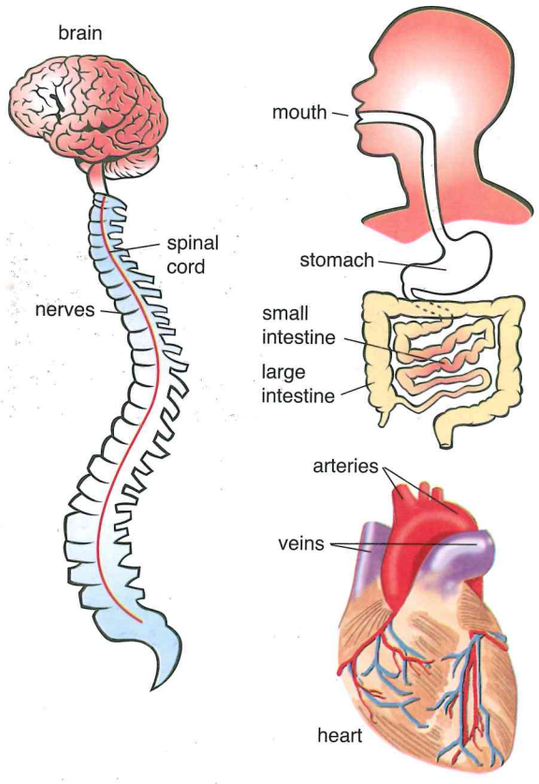
All human cells also contain **enzymes** which control chemical reactions in the cell. For example, there is an enzyme called **amylase** which is present in **saliva** in the mouth. This enzyme breaks down **starch**, a substance found in many foods and which the human body cannot **digest**. Amylase breaks starch down into sugar, which the body can use.

Cells can **specialize**. A group of specialized cells can combine to make an **organ** which has a specific function. The **heart**, for example, is an organ which

pumps blood to every part of the body. A group of organs working together is called a **system**. The **digestive system** in humans, for example, includes the mouth, the **stomach**, the **small intestine** and the **large intestine**.

One important system is the **sense organs**. They send information to the brain about the world. There are five sense organs: the **eyes**, the **nose**, the **ears**, the **tongue** and the **skin**.

B. **Write the name of each organ under the correct system.**



The digestive system

The circulatory system

The nervous system

C. **Complete the table on the next page. Use the words in the box. You can use some words in more than one space.**

ears / ~~eyes~~ / feel / feels / hear / hearing / ~~looks~~ / nose / ~~see~~ / ~~sight~~ / skin / smell / smells / sounds / taste / tastes / tongue / touch

Sense organ	Sense	Related verbs	
		I can _____ it.	*It _____ nice.*
eyes	sight	see	looks

CD 2-13

Section 2 Reading

One of the greatest projects in the history of science has only recently been completed. The Human Genome Project, which was organised by the U.S. Department of Energy and the U.S. National Institute of Health, cost three billion dollars, took 13 years to complete and involved scientists working in 18 countries. The Human Genome Project set out to discover the base sequence, or genome, of the 30,000 genes in the human DNA molecule. In other words, the project was designed to find the plan which nature follows when it makes human babies.

The Human Genome Project will change all our lives forever. It has given doctors the *owner's manual* of the human body and will be invaluable in the fight against disease. All diseases have a genetic component. It could be inherited from parents, or it could occur because of the body's response to its environment. Now doctors can analyze a patient's DNA and then look at the genome to find any differences. In theory, the doctor can then prevent, treat or cure any problem by replacing the missing or faulty gene.

For some time, scientists have been able to take genes from other organisms and put them into living cells. They can use some enzymes to cut the DNA molecule at specific points. This process is called genetic engineering. For example, the gene that makes insulin can be cut out of the DNA molecule and put into human cells which lack this gene. Insulin is essential for preventing the disease diabetes. In the future, scientists will be able to use the information from the Human Genome Project to decide which genes to change. They will be able to make new drugs for this purpose. These targeted drugs will have fewer side effects than broad-spectrum ones.

A. Choose the best answer in each case.

1. This text is about:
   a. DNA
   b. the Human Genome Project
   c. disease
   d. genes
2. How many genes are there in the human DNA molecule?
   a. three billion
   b. 30,000
   c. 13
   d. We don't know.
3. *Invaluable* (line 14) means:
   a. of no value
   b. without a price
   c. too valuable to have a price
   d. worthless
4. The Human Genome Project allows a doctor to:
   a. analyze a patient's DNA
   b. discover which diseases are inherited
   c. discover which diseases are caused by the environment
   d. compare a patient's DNA with the genome
5. *Side effects* (line 28) are:
   a. the correct effects of a drug
   b. the results of taking a drug
   c. extra effects which are good
   d. extra effects which are usually bad

B. Study the following example sentences.

Talking about possibilities

The genetic component **could** be inherited from parents.
The genetic component **could** occur because of the body's response to its environment.

Talking about present ability

Now doctors **can** analyze a patient's DNA.
Now scientists **can** use enzymes to cut the DNA molecule.

Talking about future ability

In the future, scientists **will be able to** make new drugs for this purpose. (= They can't make these drugs now.)
In the future, doctors **will be able to** prevent any problem. (= They can't prevent any problem now.)

C. Circle the correct forms of the verbs.

1. At present, doctors (*can / could / will be able to*) treat many diseases with broad-spectrum drugs. In addition, scientists (*can / could / will be able to*) treat some diseases with genetic engineering.

2. Soon, scientists (*can / could / will be able to*) treat or prevent all diseases with genetic engineering.
3. The doctor said the disease (*can / could / will be able to*) be inherited from the man's parents or it (*can / could / will be able to*) be a reaction to his environment.

CD 2-14

Section 3 Listening

A. Listen and complete the summary of the reading text in Section 2. Write one word in each space.

The Human Genome Project set out to discover the base sequence, or _____, of the 30,000 genes in the human DNA _____. The project will be invaluable in the fight against disease because all diseases have a _____ component. It could be _____ from parents, or it could occur because of the body's response to its _____.

CD 2-15,16

B. Listen to the text. What is the most surprising thing about Dolly?

1. She is a young lamb.
2. She is the first animal to be cloned.
3. She is the first animal to be cloned from adult DNA.
4. She is an exact genetic copy of her mother.

CD 2-17,16

C. Listen again and complete the summary using the words in the box. Write one word in each space.

born / copy / father / female / genetic / genome / nucleus

In 1997, the Roslin Institute introduced reporters to a lamb, Dolly, which did not have a _____. The lamb was the result of _____ engineering. The nucleus of a cell from Dolly's mother was inserted into an egg taken from another _____ sheep. The _____ contained the _____ of Dolly's mother. The egg, now containing DNA from Dolly's mother, was transferred to the womb of a third sheep. Dolly was _____ five months later. She is an exact genetic _____ of her mother.