

Grade 8 Science

Unit 4:

“Cells, Tissues, Organs & Organ Systems”

Chapter 12: The health of the body depends on the health of its interdependent systems.

How Body Systems are Connected...

All the cells of the body have the same basic needs.

- Energy
- Nutrients
- Oxygen

- Removal of wastes

Body systems work together to provide cells with what they need.

Example: Cellular Respiration

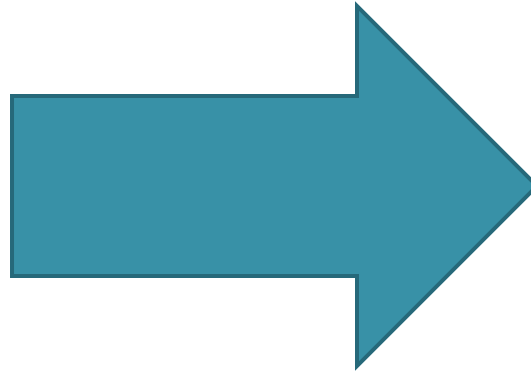
- A chemical process that releases energy that is stored in glucose.

Cellular Respiration

Glucose



Oxygen



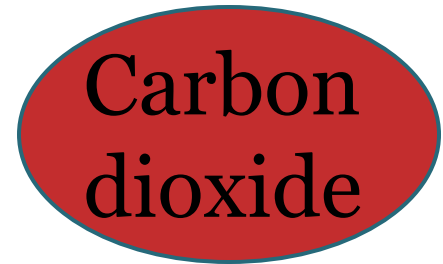
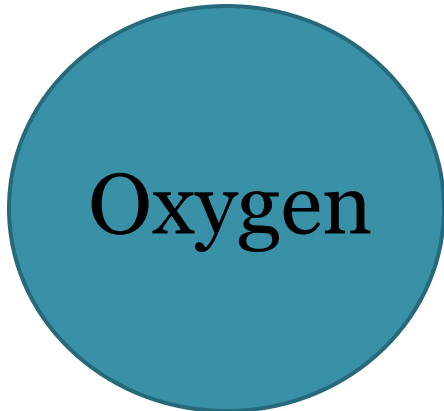
Energy



Carbon dioxide



Water vapour



Organ systems that are directly involved with cellular respiration include:

- Respiratory system
- Digestive system
- Circulatory system
- Excretory system

More Connections Between Systems include...

- Circulatory & Respiratory
- Circulatory & Digestive
- Nervous & Muscular

Circulatory & Respiratory

- The blood picks up oxygen from the lungs and delivers it to the body cells.
- The blood picks up carbon dioxide and delivers it to the lungs to be exhaled.

Circulatory & Digestive

- The digestive system breaks down food into glucose and other nutrients.
- Nutrients enter the blood from the small intestine.
- The blood carries the nutrients to the body cells.

Nervous & Muscular

- Help to keep your body temperature stable.
- The nervous system monitors conditions outside the body through temperature-sensing cells in the skin.

- The information that is sent to the brain causes the brain to send nerve signals to different parts of the body, including the muscles.
- Ex. If cold, the muscles will relax and contract rapidly.
ie. Shiver.

Body Systems & Health

- Maintaining the health of each body system keeps the network of systems, and the whole body healthy.

• Factors that affect the health of the body systems include:

1. Diet
2. Exercise
3. Stress

The Balance of Body Systems

Can be affected by both:

- Genetic factors
- Lifestyle factors

Genetic Factors

- Things you inherit from one or both birth parents.
- Out of your control

Lifestyle Factors *page 449*

- Within your control

Include:

- Diet
- Smoking
- Drugs and alcohol
- Lack of exercise

To support healthy organs and body systems, we all have the same basic needs.

- Clean air and water
- A nutritious and well-balanced diet
- Exercise
- Restful sleep

Scientific Technologies

1. Insulin pump: a device that can be programmed to deliver a specific dose of insulin at specific times during the day. Worn at all times. (**Diabetes**)



Insulin pump

2. Artificial Heart: used when a donor heart is unavailable. It is difficult for humans to stay alive for any length of time using hearts from other species.



Artificial Hearts



Core STSE

“Artificial Organs”

Core Lab Activity 12-1B

Page 442-3

“The Effect of Activity on Heart Rate and Breathing Rate”

Examples of Careers in Health

- Lab technician
- X-ray technician
- Physiotherapist
- Nutritionist
- Coaches
- Doctor



- Public health nurse



Making Informed Decisions:

Ideas for research...

- Insurance companies
- Fitness equipment
- Use of sunscreen
- Food additives
- Steroids
- Other?