

Science Links 10 Workbook Answers

Unit 1 Tissues, Organ, and Systems

Using Your Appendices, page 7

1.

Power of objective lens	Power of eyepiece lens	Total magnification (power of objective lens multiplied by power of eyepiece lens)
Low power: 4x	10x	$4 \times 10 = 40x$
Medium power: 10x	10x	$10 \times 10 = 100x$
High power: 40x	10x	$40 \times 10 = 400x$

- If you use the coarse-adjustment knob at medium or high power you may have trouble seeing the object, and could damage the lens or the slide.
- Switch back to low power and check that the object being viewed is in the middle of the stage opening.
- Drawings may vary. Image under low power should be roughly four times normal size and take up half the circle. Image under medium and high power should show section of image roughly 10 times and 40 time normal size.

Topic 1.1 Why are cells important?

Reading Check, page 9

- A cell needs different organelles to carry out different functions such as producing energy and storing materials.
- Oxygen will move from the inside to the outside across the cell membrane until there is an even distribution of oxygen outside and inside the cell.

Cloze Activity, page 10

- cells
- organelles
- cell membrane
- nucleus
- mitochondria
- vacuoles
- cytoplasm
- diffusion
- osmosis

Applying Knowledge, page 11

1. nucleus
2. ribosome
3. mitochondria
4. cytoskeleton
5. endoplasmic reticulum
6. cytoplasm
7. vacuole
8. Golgi body
9. cell membrane
10. vesicle

Analyze the Information, page 12

There is a high concentration of pizza odour around the pizza shop and no odour where the people are sitting. The odour spreads through the air until the concentration is equal throughout the food fair. This is an example of diffusion because particles are moving from an area of high concentration to an area of low concentration.

Assessment, page 13

1. C
2. A
3. F
4. B
5. D
6. E
7. the cell
8. Answers could include three of the following: produce protein, produce energy, provide structural support, transport materials, sort and package materials, control the cell's activities, and reproduce.
9. a) The nucleus controls all the cell's activities. The mitochondria produce energy for the cell's activities.
b) Vacuoles store and transport small molecules inside the cell. The cell membrane controls the movement of molecules into and out of the cell.
10. Diffusion and osmosis allow the movement of molecules into and out of the cell so the cell can get nutrients, oxygen, and water, and get rid of waste.

Topic 1.2 Why do animal cells divide and what happens when they do?

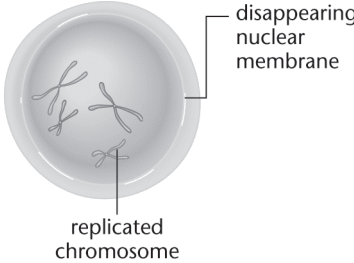
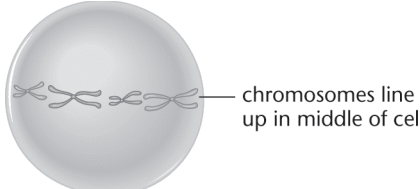
Reading Check, page 15



1. interphase
2. Cytokinesis is the stage of the cell cycle in which the cytoplasm and organelles divide into two identical, separate cells.

Comprehension, page 16

1. If a cell becomes too large, it will not be able to transport materials between the cell membrane and the centre of the cell, and it will die.
2. Each new cell has the same information coded in the DNA as the original cell.
3. mitosis and cytokinesis
4. a) The growth stage. Most of the life of the cell is spent in this stage. The cell grows and carries out its life functions. The cell makes a copy of its organelles and DNA to prepare for division.
b) The contents of the nucleus separate into two identical parts. Mitosis has four phases: prophase, metaphase, anaphase, and telophase.
c) The cytoplasm and organelles divide into two identical, separate cells.
5. Cell division is a small, but important, part of the life cycle of a cell. The largest part is the growth stage.
6. genetic inheritance, environmental factors, chemical factors

Illustrating Concepts, page 17

Phase	What is happening in the cell?	Labelled diagram
Prophase	<ul style="list-style-type: none"> • The nuclear membrane begins to disappear. • The duplicated DNA condenses into chromosomes that are visible under the microscope. Each chromosome is made up of two identical copies of DNA that are joined at one point. 	
Metaphase	<ul style="list-style-type: none"> • Fibres in the cytoplasm push the chromosomes together, lining them up in the middle of the cell. 	

Phase	What is happening in the cell?	Labelled diagram
Anaphase	<ul style="list-style-type: none"> • The two strands of each chromosome separate, separating the two identical copies of DNA. Each part is now called a chromosome. • The new chromosomes are pulled apart to each end of the cell. 	
Telophase	<ul style="list-style-type: none"> • Membranes begin to form around the two new nuclei. Each nucleus has a complete set of chromosomes that contain a complete copy of the cell's DNA. • The chromosomes begin to uncoil. 	

Cloze Activity, page 18

1. cell cycle
2. interphase. nucleus
3. cell division
4. mitosis, cytokinesis
5. metaphase
6. telophase, membrane
7. cytoplasm, two
8. tumour
9. cancer

Assessment, page 19

1. I
2. B
3. H
4. D
5. A
6. G

7. C
8. E
9. F
10. Answers should include two of the following: growth, maintenance, and repair.
11. growth (interphase) and division (mitosis and cytokinesis)
12. prophase, metaphase, anaphase, and telophase
13. A mutation is a permanent change in a cell's DNA.

Topic 1.3 How do cells work together in the human body?

Reading Check, page 21

1. Answers could include four of the following: muscle cell, blood cell, bone cell, nerve cell, and skin cell.
2. A tissue is a group of cells that have the same structure and function in the body.
An organ system is a group of organs working together to perform many functions.

Comprehension, page 22

1. Cell differentiation is the process by which identical stem cells change into specialized cells that have different structures and functions.
2. Answers could include three of the following: muscle cell, blood cell, bone cell, nerve cell, and skin cell.
3. Muscle cells are long and thin, which allows them to contract and stretch. Some have a branching pattern that increases their strength. They also contain many mitochondria to supply the energy the cells need for movement.
4. Nervous tissue senses, conducts, and transmits information.
5. The heart is made of muscle tissue so it can pump the blood through the veins and arteries. It is also made of nervous tissue that transfers signals to the heart from other parts of the body.
6. The stomach, and the small and large intestines.
7. Cells of the same type form tissues and groups of tissues work together in organs.

Assessment, page 23

1. D
2. F
3. G
4. E
5. B

6. H
7. A
8. C
9. Stem cells can develop into any type of cell that is needed to help treat the disease.
10. Nerve cells have long, thin, thread-like branches that allow them to transmit signals between cells in the body that are far apart.
11. The digestive system takes in and breaks down food, absorbs nutrients, and rids the body of solid waste. The respiratory system delivers the nutrients to cells throughout the body. The respiratory system also controls breathing, delivers oxygen to the blood, and removes carbon dioxide from the blood. Both systems process materials the body needs and dispose of the waste products.

Topic 1.4 How do systems work together in the human body?

Reading Check, page 25

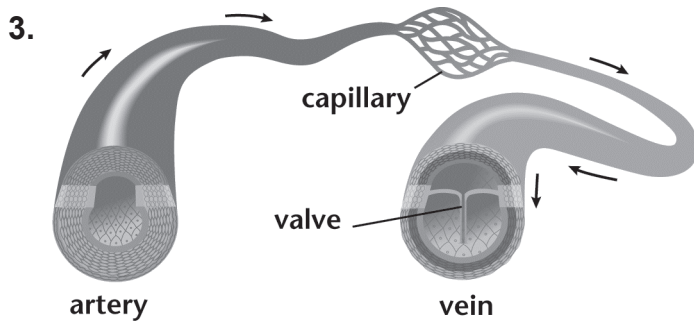
1. Gas exchange occurs in the lungs between the alveoli and the capillaries.
2. The four main tasks of the digestive system are ingestion, digestion, absorption, and elimination.

Cloze Activity, page 26

1. cellular respiration
2. hairs, fluid
3. alveoli
4. capillaries
5. heart
6. veins, arteries
7. ingestion, digestion, absorption, elimination
8. glucose, oxygen
9. carbon dioxide, water, usable energy

Interpreting Illustrations, page 27

1. a) oxygen
b) nose, throat, series of tubes, smaller tubes
2. a) between blood and alveoli
b) alveoli have thin walls
c) red blood cells



Applying Knowledge, page 28

Part of digestive system	Describe what is happening at this stage of digestion
1. mouth	Food enters the mouth. Digestion begins with chewing, as the tongue, teeth, and saliva break down the food.
2. stomach	Stomach muscles contract to mix food. At the same time the stomach releases powerful acids and other chemicals that further break down the food.
3. small intestine	Digestions continues. Nutrients from the food are absorbed into the bloodstream.
4. large intestine	Undigested food passes into the large intestine where water and some nutrients are reabsorbed.
5. anus	Undigested materials (feces) are eliminated through the anus.

Assessment, page 29

1. G
2. A
3. E
4. B
5. F
6. H
7. C
8. D
9. Gas exchange is the process of taking in oxygen and releasing carbon dioxide.
10. They work together to bring oxygen to the cells.
11. They work together to bring nutrients to the cells.

Topic 1.5 How do technology, substances, and environmental factors affect human health?

Reading Check, page 31

1. Answer could include three of the following: radiation from excessive use of cellphones, X rays, or CT scans, ultra-violet radiation from the Sun, cigarette smoke, pesticides, and air pollution.

Applying Knowledge, page 32

2. a) F
b) A
c) D
d) B
e) E
f) G
g) C
3. a) endoscopy
b) ultrasound
c) PET scan
d) microscopy

Assessment, page 33

1. D
2. G
3. E
4. B
5. C
6. A
7. F
8. An MRI can be used to diagnose disease in organs and soft tissues, or to contrast soft and hard tissues.
9. Answers could include skin and eye damage, and increased risk of skin cancer.
10. Answers may vary. For example: Excessive cellphone use may lead to brain damage. Cigarette smoke causes lung cancer. Exposure to sunlight increases the risk of skin cancer.

Literacy Test Preparation, page 35

1. B
2. C
3. B
4. D
5. Summaries should include the main idea and one supporting point, and be written in paragraph form. For example:

While some commonly used materials can be a cause of cancer, not all claims about substances that cause cancer are true. For example, although there have been reports that plastic water bottles contain dioxins, there is no scientific evidence that they do. Also, some types of plastic are safe to microwave, and others are not. You should always read the product label to see if the plastic is safe to use in a microwave. You should always consult a reliable source to learn if a material is harmful or not.