

A

- adaptation** physical characteristic or behaviour of a species that increases the species' chances of survival in a particular environment
- alveoli** tiny air-filled sacs in the lungs; the site of gas exchange (singular alveolus)
- amplitude** height of the wave from its middle rest position to its highest point
- angle of incidence** angle between the incident ray and the normal
- angle of reflection** angle between the reflected ray and the normal
- aorta** large artery carrying blood from the left ventricle to the body
- aperture** hole or opening in a camera that lets in light
- aqueous solution** solution in which water is the solvent
- arteries** thick-walled blood vessels that take blood away from the heart to the rest of the body
- atherosclerosis** cholesterol build-up on the walls of arteries
- atria** upper chambers of the heart that receive blood from the body and lungs (singular atrium)
- autonomic nervous system** division of the peripheral nervous system that controls automatic responses in the body, such as heart rate
- axon** long extension of a neuron's cell body that transmits information to neighbouring cells

B

- binoculars** device for viewing distant objects; made up of two short refracting telescopes fitted together
- bioluminescence** the ability of certain organisms to produce light by a chemical reaction
- bronchi** two main branches of the trachea that lead into the lungs (singular bronchus)
- bronchioles** tubes that connect the bronchi to the air sacs in the lungs

bronchitis disease in which mucus builds up in the bronchi and causes them to become narrower

buoyancy tendency of an object to float when placed in a fluid

buoyant force upward force that a fluid exerts on an object; opposite to the pull of gravity on an object in a fluid

C

camera eyes eyes that are round and have a cornea, a lens, and a retina

capillaries tiny blood vessels that connect arteries to veins; one cell layer thick and extremely narrow

carbon monoxide colourless, odourless gas that is released when a cigarette burns

cell the basic unit of life

cell membrane thin structure that encloses all the contents of plant and animal cells; has tiny openings that allow particles of some substances, but not others, to pass through

cell wall outer covering of a cell that provides strength and support; found only in plant cells

central nervous system division of the nervous system composed of the brain and spinal chord

charge-coupled device device that converts light into electrical energy; used in digital cameras

chemical digestion breakdown of large food particles into smaller particles by enzymes

chloroplasts organelles that convert sunlight into food; found only in some plant cells

cilia hair-like extensions that protrude from the surface of some unicellular organisms and from some cells in multicellular organisms

circulatory system transport system reaching every cell in the body; delivers nutrients absorbed by the digestive system and oxygen absorbed by the respiratory system to every cell; transports waste products from cells for removal by the excretory system; defends the body against disease; connects all organ systems

climate average weather measured over a long period of time

colloid cloudy mixture in which the droplets or tiny particles are too small to separate out

complex machines system in which simple machines all work together; parts of a complex machine that have just one function are called subsystems and often contain a simple machine

compound eyes eyes that are made up of many smaller units; found in insects and crustaceans

compound light microscope microscope that has two or more lenses and has a light source

compressibility extent to which a substance (solid, liquid, or gas) can be compressed; objects under compression tend to deform in shape

concave lens piece of transparent material that is thinner in the middle than at the edges; light rays passing through it diverge or spread out

concave mirror reflecting surface that is curved inward like the inside of a bowl or a spoon; light rays reflected from it converge (come together)

concentration the amount of solute (usually in grams or kilograms) dissolved in a specific amount of solvent (usually in millilitres or litres) in a solution; written g/mL or kg/L

cones specialized cells in the retina that detect colour; there are three types of cones, each sensitive to different colours: red, green, and blue.

connective tissue supports and connects different parts of the body

Continental Divide highest point of land on a continent; rivers flow into different oceans depending on which side of the divide they start

convex lens piece of transparent material that is thicker in the middle than at the edges; light rays passing through it converge or come together

convex mirror reflecting surface that bulges out like the back of a spoon; light rays reflected from it diverge (spread out)

crest highest point of a wave

current stream of water that moves within a larger body of water

cytoplasm contents of the cell inside the cell membrane excluding the nucleus; contains nutrients the cell needs to survive

D

dendrites small branches of a neuron that receive information from neighbouring cells

density mass per unit of volume; calculated by dividing the mass of a substance by its volume

dialysis removal of waste products from the blood using a machine that functions as a kidney

diaphragm large muscle below the lungs that helps move air in and out of the lungs; part that changes the size of a camera's aperture; it varies the amount of light that reaches the film

diffuse reflection reflection that happens when parallel rays hit a rough surface; all rays reflect at different angles

diffusion the movement of particles of a substance from an area of higher concentration to an area of lower concentration

digestive system breaks down the food you eat into parts small enough to be absorbed and transported throughout the body

digital imaging process of creating an image using a computer

distillation technique for separating solutions that involves boiling and condensation

diversity description of the variety of different species in an ecosystem; may also be used to describe variety in a population or species

E

efficiency measurement of how well a machine or device uses energy; can be calculated by dividing mechanical advantage by speed ratio or by dividing work output by work input

electromagnetic radiation all forms of radiant energy: visible light, infrared radiation, ultraviolet radiation, radio waves, X-rays etc.

electromagnetic spectrum refers to the whole range of wavelengths of visible and invisible electromagnetic radiation

emphysema disease that causes damage to lung tissue, causing shortness of breath

enzyme substance created by the body to carry out chemical digestion

epithelial tissue covers the surface of the body and internal organs and lines the inside of some organs

excretion waste removal

excretory system removes chemical and gaseous wastes from the body; involves organs from other bodily systems

eyepiece lens or set of lenses in a microscope or telescope that is closest to the user's eye

F

field of view the area that you can see when looking through a microscope

film material that is sensitive to light; used in cameras to record images

fluid any matter that has no fixed shape, can flow, and takes the shape of its container; any substance in a gas or liquid state

fluorescent form of artificial light; uses ultraviolet light waves to make the coating inside an opaque tube glow white

focal point point at which light rays meet, or appear to meet, after being reflected by a mirror, or refracted by a lens

friction force that opposes motion

function purpose or task

G

gamma rays high-energy electromagnetic radiation with the shortest wavelength; used to treat some types of cancer

gastric juice liquid in stomach made of mucus, hydrochloric acid, enzymes, and water; chemically digests food

gears pair of wheels with teeth that interlink; when they rotate together, one gearwheel transfers turning motion and force to the other

glacier large moving body of ice; glaciers can be many metres or even kilometres thick

H

hard water water containing a high concentration of calcium and magnesium

hazard symbol warning symbol on hazardous materials; made up of a safety warning enclosed in a yellow triangle (which means "caution"), orange diamond (which means "warning"), or red octagon (which means "danger")

heterogeneous mixture mixture in which the different substances can be seen

homogeneous mixture mixture in which the different substances cannot be seen; a mixture that looks as if it is all one substance

hydraulic system system that uses a liquid under pressure to move loads; device that uses liquids in a confined space to transfer forces; works according to Pascal's law

hydrometer device used to measure the density of liquid

I

incandescent form of artificial light; uses electrical energy to heat a thin wire thread that glows white hot

incident ray ray of light that arrives at a mirror or other substance

inclined plane simple machine made up of a flat surface, such as a board, at an angle to another flat surface, such as the ground or a table top; ramp

incompressible not capable of being compressed; liquids are said to be incompressible

infrared rays electromagnetic waves that have less energy than visible light; they are invisible but can be felt as heat

input force force applied to operate a machine

integumentary system protects body's internal environment from the external environment

intensity brightness of light; amount of light arriving per unit area at a place

interact work together

interneurons neurons in the central nervous system that connect sensory neurons to motor neurons

invisible spectrum parts of the electromagnetic spectrum that the human eye cannot see

iris band of muscle in the eye that controls the size of the pupil and the amount of light entering the eye

L

laser acronym for light amplification by the stimulated emission of radiation; beam of light whose waves all have the same frequency and move in step and in the same direction; able to travel long distances without spreading out

law of reflection angle of incidence of a wave hitting a surface equals the angle of reflection

lens curved piece of glass or other transparent material that refracts light in a predictable way

lever simple machine made up of a rigid bar or plank that rotates on a fixed object called a pivot or fulcrum

linkage belt or chain to transfer energy from an energy source to an object (e.g., a bicycle chain)

luminous describes objects that produce light; for example, the sun, light bulb, fire, etc.

lung cancer growth of tumours, which take up space in the lungs, making breathing difficult

M

machine device that helps us do work

marrow type of connective tissue found in the bones that produces red blood cells

mechanical advantage amount by which a machine can multiply a force; calculated by dividing the output force by the input force

mechanical digestion physical breakdown of food into small particles

mechanical mixture heterogeneous mixture; mixture in which the different substances are easy to see

metabolism all the life processes that take place in the cell; includes energy-using and energy-creating processes

micro-organisms usually unicellular organisms that can be seen only through a microscope

microscope optical device used for viewing very small objects; has at least two lenses: the objective lens and the eyepiece lens

microvilli finger-like projections on the cells that line the villi (singular microvillus)

microwaves electromagnetic radiation that has a shorter wavelength than radio waves and carries more energy; used to cook food and transmit audio and video signals

mitochondria organelles that convert energy the cell receives into a form it can use (singular mitochondrion)

mixture combination of two or more different pure substances

monitor observe, check, or keep track of something for a specific purpose

motor neurons carry information from the central nervous system to the muscles or other organs

multicellular made of more than one cell

muscle tissue allows movement

muscular system moves bones; moves organs that contain muscle tissue

mycoplasma type of microscopic organisms

N

nephrons filtering units of the kidney that remove wastes from the blood and produce urine

nervous system coordinates and controls all organs and organ systems; detects, processes, and responds to stimuli

nervous tissue tissue of the brain, spinal chord, and nerves

neurons specialized cells of the nervous system that receive and transmit information

nicotine addictive drug found in cigarettes that speeds up the heart and raises blood pressure

nocturnal describes animals that are active at night

non-luminous describes objects that do not produce light but may reflect it (for example, the moon); most objects on earth are non-luminous

normal line perpendicular to a surface (that is, forms a 90° angle with the surface)

nucleus organelle that directs all the activities in a cell

O

objective lens lens in an optical device, such as a microscope or telescope, that gathers light from an object to form an image

ommatidium unit of a compound eye; has a lens, focussing cone, and light-sensitive cell (plural ommatidia)

opaque describes materials that do not allow light to pass through; for example, wood, metal, cardboard, etc.

optic nerve nerve that leads from the retina to the brain

optical device any device that uses light; for example, mirrors, lenses, microscopes, and telescopes

organ group of tissues that work together to perform a specific function

organ system group of organs that work together to perform a certain task, such as digestion or breathing

organelles structures in cells that perform a certain function

organisms living things

osmosis diffusion of water through a selectively permeable membrane

output force force a machine applies to an object

P

particle model of matter model that explains the behaviour of solids, liquids, and gases; it states that all matter is made up of tiny moving particles that attract each other and have spaces between them

Pascal's law when pressure is applied to a liquid in a container, the pressure and force is transmitted equally and undiminished throughout the liquid; an enclosed liquid transmits pressure equally in all directions

pasteurization process of heating food to a high temperature in order to kill harmful micro-organisms

peripheral nervous system division of the nervous system composed of the cranial and spinal nerves

peristalsis wave-like muscle contractions along the digestive system

phosphor substance that emits light when exposed to ultraviolet radiation

phosphorescence process in which a substance emits light after it has absorbed ultraviolet light

photophore light-producing organ found in bioluminescent organisms

photoreceptors light-sensitive cells found in the retina of the eye; there are two types: rods and cones

photosynthetic tissues group of cells containing chloroplasts; produces food for the plant

pixel short for picture element; individual element of a digital image

plane mirror flat mirror; reflecting surface that has no curvature

platelets cell fragments in the blood that help stop bleeding at cuts

pneumatic system system that uses a gas under pressure to move loads; device that uses gases in a confined space to transfer forces; works according to Pascal's law

population group of organisms of the same species that live in a particular area

potable water water that is safe for humans to drink

pressure measure of the amount of force applied to a given area; as an equation $p=F/A$, where p is pressure, F is force, and A is area; measured in pascals (Pa)

primary colours red, green, and blue light; adding these three colours of light produces white light

protective tissues protect a plant and absorb water from soil

pseudopods foot-like projections on an amoeba; used for movement and capturing food

pulley simple machine made up of a wire, rope, or cable moving on a grooved wheel; may be made up of one or many wheels; can be fixed in place or movable

pump device that moves a fluid through or into something; piston pumps, diaphragm pumps, and Archimedes screws are three common kinds of pumps; the heart is a natural pump

pupil opening in the eye that lets in light

pure substance substance made up of only one type of matter; matter that has one type of particle throughout

R

radar acronym for **radio detection and ranging**; system that detects reflected microwaves

radio waves electromagnetic radiation used in communications around the world

ray diagram diagram used to represent how light travels; each ray has an arrow to show the direction of travel

react respond

real image image formed when rays meet at a point; the image can be projected onto a screen

red blood cells small, pliable cells that have no nucleus and are specialized for carrying oxygen to all the cells of the body

reflecting telescope telescope that uses a curved mirror and a lens to form an enlarged image

reflex automatic response to a stimulus; happens very quickly and without conscious control

refracting telescope telescope that uses two lenses to form an enlarged image

refraction bending of light as it travels from one material to another material

regular reflection reflection that happens when parallel rays hit a smooth surface; all rays reflect at the same angle

resolution the number of pixels per unit area in a digital image

respiratory system supplies blood with oxygen from the outside air and removes carbon dioxide from your blood

response organism's reaction to a stimulus

retina special lining on the back of the eye; when light hits the retina, receptor cells send messages to the brain, which translates them into an image

reverse osmosis movement of water through a membrane from an area of lower water concentration to one of higher water concentration; technique used for purifying water

rods specialized cells in the retina that are sensitive to low levels of light

S

salinity amount of dissolved salts in water

saturated solution solution in which no more solute can be dissolved at a given temperature

saturation point point at which no more solute can be dissolved in a given volume of solvent at a given temperature

screw simple machine that consists of a cylinder with a groove cut in a spiral on the outside

secondary colours yellow, cyan, and magenta; colours made from adding any two primary colours of light

sediments eroded rock fragments and soil carried by water or wind

selectively permeable describes a membrane with very small openings that allow particles of some substances, but not others, to pass through

sensory neurons cells that carry information from the body to the central nervous system

shutter part that acts like a door to control the amount of light entering a camera

simple machine tool or device made up of one basic machine

skeletal system provides a mobile support frame for the body; protects soft-tissue organs

smallpox disease that produces a rash and high fever and can cause blindness and death; the first disease to be controlled by a vaccine

solubility ability to dissolve; the mass of solute that can dissolve in a given amount of solvent to form a saturated solution at a given temperature

solute substance that dissolves in a solvent to form a solution

solution homogeneous mixture; mixture of two or more pure substances that looks like one substance

solvent substance that dissolves a solute to form a solution; water and alcohol are common solvents

somatic nervous system division of the peripheral nervous system that controls voluntary responses

specialized cells cells that have specific structures that help them to perform particular functions

speed ratio measure of how the speed of the object is affected by a machine; calculated by dividing the input distance by the output distance

spontaneous generation false idea that living things could come from non-living matter

stimulus any change in an organism's environment (plural stimuli)

storage tissues stores food in plants

stream characteristics characteristics used to describe a stream or river; these include volume and rate of flow, slope and shape of bed

structures parts of an organism that perform specific tasks

subsystem (of a machine) smaller group of parts within a complex machine that performs a specific function

suspension cloudy mixture in which droplets or tiny pieces of one substance are held within another substance; if you leave a suspension undisturbed, its parts will usually separate out

system (in context of machine) a group of parts that work together to perform a general function, forming a complex machine

T

tar dark sticky substance formed when tobacco burns

telescope optical device for viewing distant objects; there are two types: reflecting and refracting telescopes

theory of colour addition theory that explains what happens when coloured lights are mixed together

tide daily change in water level of the oceans

tissue group of similar cells working together to perform a specific function

translucent describes materials that allow some light to pass through

transmission special type of linkage for transferring the energy from the engine to the wheels in large vehicles such as cars and trucks

transparent describes materials that allow light to pass through with little or no reflection; for example, glass

transport tissues transport food and water to different parts of the plant; includes xylem and phloem

U

ulcers painful sores on the stomach lining often caused by the micro-organism *H. pylori*

ultraviolet light electromagnetic waves that have more energy than visible light; too much ultraviolet radiation can increase the risk of skin cancer

unicellular made of just one cell

unsaturated solution solution in which more solute can be dissolved at a given temperature

urea poisonous substance converted from highly toxic ammonia by the liver

V

vaccine substance that is taken by or injected into an animal or person to produce an immunity to a disease; usually prepared from a mild form of the disease

vacuoles organelles that store water and other substances required by the cell

valve device that controls the flow of fluids

veins blood vessels that return blood from the body to the heart; have valves

ventricles lower chambers of the heart that pump blood to the body

villi small finger-like projections on the inner surface of the small intestine that absorb nutrients (singular villus)

viscosity liquid's internal resistance or friction that keeps it from flowing

visible light spectrum colours of visible light; the colours in a rainbow or viewed when light is split by a prism

W

water quality measure of the amount of substances besides water in a water sample; description of how pure a water sample is

watershed area of land that drains into one main lake or river

wave in water, circular movement of water particles that causes a change in pattern that moves along the water's surface; the pattern can move over long distances but the water particles do not

wave model of light model used to explain the characteristics and behaviour of light energy; it describes light as energy in the form of waves; the different colours of light have different wavelengths; waves with shorter wavelengths have higher energy than those with longer wavelengths

wavelength distance between the top or crest of one wave and the crest of the next

wedge simple machine that looks like an inclined plane, but is forced into an object

wheel and axle simple machine made up of two wheels of different diameters that turn together; a longer motion on the wheel produces a shorter but more powerful motion at the axle

white blood cells blood cells specialized to fight infection

WHMIS Workplace Hazardous Materials Information System; a system of easy-to-see special warning symbols on hazardous materials

work done when a force acts on an object to make the object move; calculated by multiplying force times distance

X

X-rays high energy electromagnetic radiation; can be used to make images of the interior of the body

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