

Robert Prior

Word Puzzles

from **Nelson Biology 12**

Crossword and word search puzzles for every chapter and unit, with solutions,



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Chapter 1

The Biochemical Basis of Life

Across

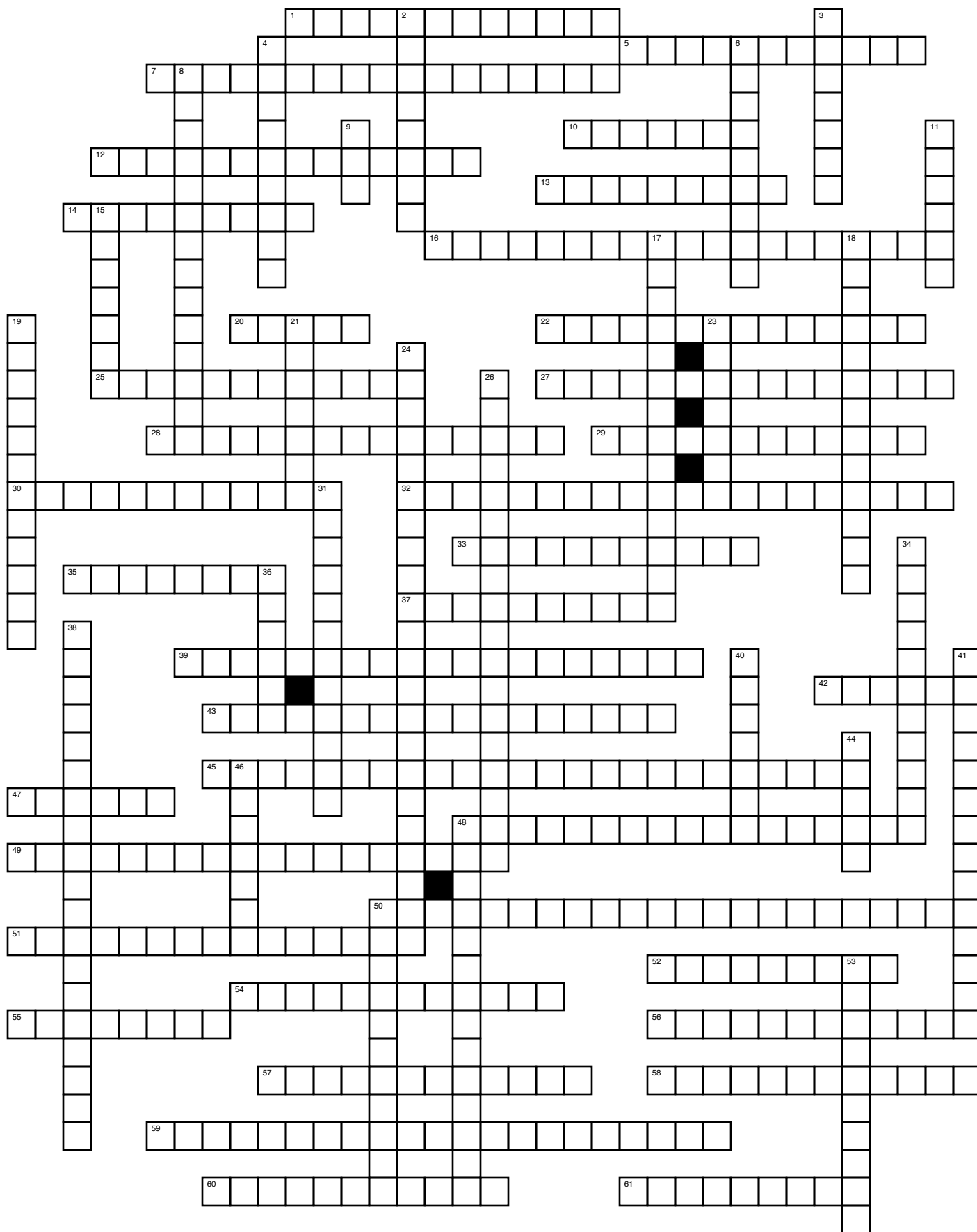
1. a lipid that consists of two fatty acids and a phosphate group bound to glycerol
5. non-polar molecules that are not strongly attracted to water
7. very weak attractions between two molecules, or parts of molecules when they are close together (four words)
10. a lipid that is composed of four carbon rings
12. the simplest form of carbohydrate, consisting of a single sugar unit; building block for more complex carbohydrates
13. a substance that is recognized by and binds to an enzyme
14. a molecule that contains a carboxyl group and an amino group; serves as the monomer subunit of proteins (two words)
16. a molecule that is comprised of hundreds to thousands of monosaccharides linked together; an essential part of nutrition and a valuable energy source (two words)
20. a non-polar compound that is made mostly of carbon and hydrogen
22. a bond between two monosaccharides (two words)
25. a radioactive isotope of an element
27. a group of atoms that affects the function of a molecule by participating in chemical reactions (two words)
28. a model of enzyme activity that describes how an enzyme changes shape to better accommodate a substrate (two words)
29. a biomolecule that consists of carbon, oxygen, and hydrogen
30. attractive force between a partially positively charged hydrogen atom, and a partially negatively charged atom in another molecule (two words)
32. the regulation of one site of a protein by binding to another site on the same protein (two words)
33. polar or charged molecules that are strongly attracted to water
35. an organic molecule that acts as a cofactor of an enzyme
37. a pocket or groove in an enzyme that binds its substrate (two words)
39. a chemical reaction in which subunits of a larger molecule are joined by the removal of water; also called a condensation reaction (two words)

42. an ion that has a positive charge
43. the measure of an atom's attraction to shared electrons
45. a situation in which molecules bind to an enzyme at a site that is not the active site, thus blocking enzyme activity (two words)
47. a molecule that has the same composition as another, but a different arrangement of atoms
48. a bond between two atoms, made up of unequally shared electrons (three words)
49. the regulation of a pathway by one of the products of this pathway (two words)
50. a molecule that contains many linked monosaccharides (two words)
51. an electron in the outermost energy level or shell of an atom (two words)
52. a bond that results from the attraction between two oppositely charged atoms or molecules (two words)
54. a fat; three fatty acid chains linked to a glycerol molecule
55. a non-protein group that binds to an enzyme and is essential for catalytic activity
56. the amount of thermal energy required to raise the temperature of a given quantity of a substance by 1 °C (two words)
57. oriented in opposite directions
58. a lipid that is composed of saturated fatty acids with single bonds in their hydrocarbon chain (two words)
59. a situation in which a competitor substance binds to a normal substrate binding site to block enzyme activity (two words)
60. a covalent bond that links amino acids (two words)
61. a molecule that consists of a carboxyl group and a hydrocarbon chain (two words)

Down

2. partial positive or negative charge at the ends of a molecule
3. a large molecule that is formed when monomers link together chemically in a chain
4. a reaction in which a molecule gains electrons
6. a reaction in which a molecule loses electrons
8. the process in which a molecule spontaneously dissociates into ions

9. a lipid that is formed when long fatty acid chains are joined to alcohols or carbon rings
11. a chemical that compensates for pH changes in a solution by accepting or donating H⁺ ions
15. a small molecule that can bind chemically to other molecules
17. a binding site on an enzyme that binds regulatory molecules (two words)
18. an electron transfer reaction (two words)
19. a carbohydrate molecule that is made from two monosaccharide units
21. a large molecule that consists of many amino acid subunits, which are joined together by peptide bonds folded into a specific three-dimensional shape
23. a form of an element that differs in its number of electrons
24. a reaction in which an acid and a base combine to create a salt and water (two words)
26. a chemical reaction in which water is used as a reactant to split a larger molecule into smaller subunits (two words)
31. the loss of both the structure and function of a protein
34. a blueprint for proteins that are synthesized in cells; stores hereditary information (two words)
36. a biological catalyst, usually a protein, that speed up a chemical reaction
38. force of attraction between two molecules (two words)
40. a chain of amino acid subunits, which are connected by peptide bonds
41. a lipid that is composed of unsaturated fatty acids with double bonds in the hydrocarbon chain (two words)
44. an ion that have a negative charge
46. a region of space that is occupied by electrons located around the nucleus of an atom
48. a process in which small subunits are linked to form a large molecule
50. a peptide with more that 50 amino acids
53. the building block of nucleic acids; consists of a 5-carbon sugar, a nitrogenous base, and one to three phosphate groups



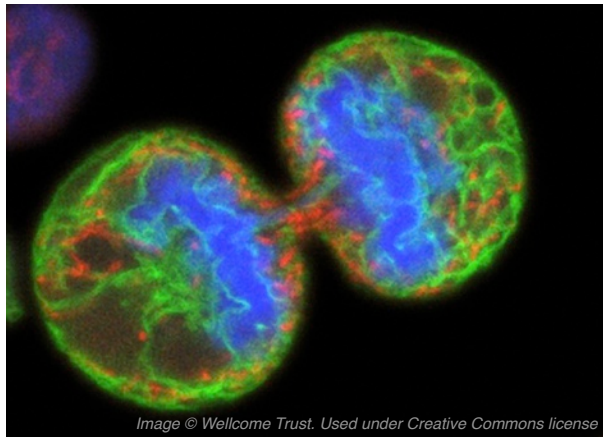


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Chapter 2

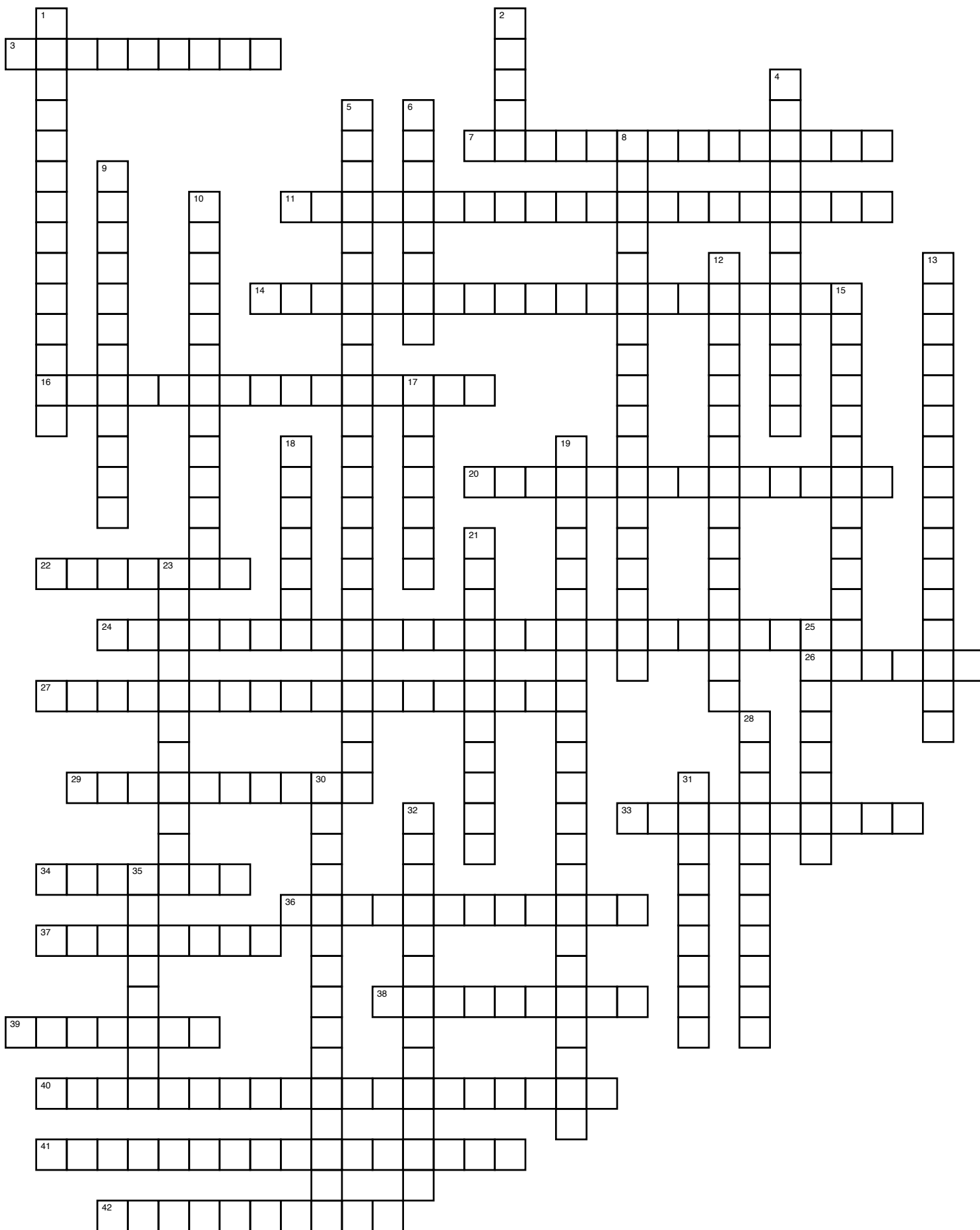
Cell Structure and Function

Across

3. a whiplike tail that is used in propulsion of both prokaryotic and eukaryotic cells
7. a protein that binds to a molecule and transports it across the lipid bilayer (two words)
11. the facilitated transport of ions and polar molecules through a membrane via protein complexes (two words)
14. a membrane-bound organelle that is folded into flattened sacs and tubes, and is often an outgrowth of the nuclear envelope in a eukaryotic cell (two words)
16. a two-layer membrane that encloses the nucleus of a eukaryotic cell (two words)
20. a hydrophilic pathway in a membrane that enables water and ions to pass through (two words)
22. a small, membrane-bound organelle that may transport, store, or digest substances within a cell
24. a protein on the surface of the membrane (three words)
26. a type of steroid with an OH group at one end and a non-polar hydrocarbon chain at the other
27. the state in which continuous action results in balanced conditions (two words)
29. an organelle that stores starch
33. any membrane lipid that is bound to a carbohydrate
34. a membrane-bound organelle that is involved in photosynthesis and storage in plants and algae
36. a membrane component that contains a sugar, or carbohydrate, bound to an amino acid
37. a small, membrane-bound organelle that contains digestive enzymes, which aid in waste disposal
38. an organelle with folded membranes where the final packaging of proteins occurs (two words)
39. areas of endoplasmic reticulum with ribosomes attached to the surface (two words)
40. a molecular system that supports and protects a cell; a cell's environment (two words)
41. the idea that a biological membrane consists of a fluid phospholipid bilayer, in which proteins are embedded and float freely (three words)
42. a solution that has a higher solute concentration than another solution
10. a coating that is added to a plant cell wall; it is more rigid and often thicker than the primary cell wall (two words)
12. the movement of substances across membranes against their concentration gradient using pumps (two words)
13. the movement of a substance across a membrane without expending energy (two words)
15. a fibre structure that is made from actin, which is part of the cytoskeleton and is located in the cytosol of cells
17. the passive diffusion of water across a membrane
18. a liquid-filled organelle that stores waste and aids in cellular metabolism and water balance
19. a protein that is embedded in the lipid bilayer (three words)
21. a cellulose coating that surrounds a plant cell (two words)
23. an organelle that makes and stores pigments other than chlorophyll
25. a solution that has the same solute concentration as another solution
28. a double-membrane-bound organelle that contains enzymes and pigments, which are used to perform photosynthesis in eukaryotic cells
30. the ability of small and non-polar substances to move across a membrane unassisted (two words)
31. a solution that has a lower solute concentration than another solution
32. an organelle with two membranes; the site of most ATP synthesis during aerobic cellular respiration
35. areas of endoplasmic reticulum without attached ribosomes (two words)

Down

1. a dynamic barrier that surrounds the cytosol of the cell (two words)
2. tiny hairlike structures that move water and mucus in eukaryotes; used for movement of prokaryotic cells
4. a dynamic system of filaments that provides cell structure, helps with cell division, and enables the cell and inner organelles to move around
5. the combined effects of a difference in electrical potential energy and a difference in the concentration gradients of ions (two words)
6. the outer barrier of a plant cell; surrounds the plasma membrane and gives structure to the plant (two words)
8. a group of interacting organelles between the nucleus and the plasma membrane (two words)
9. a structure that allows cells to interact with each other and the surrounding environment (two words)





Unit 1

Biochemistry

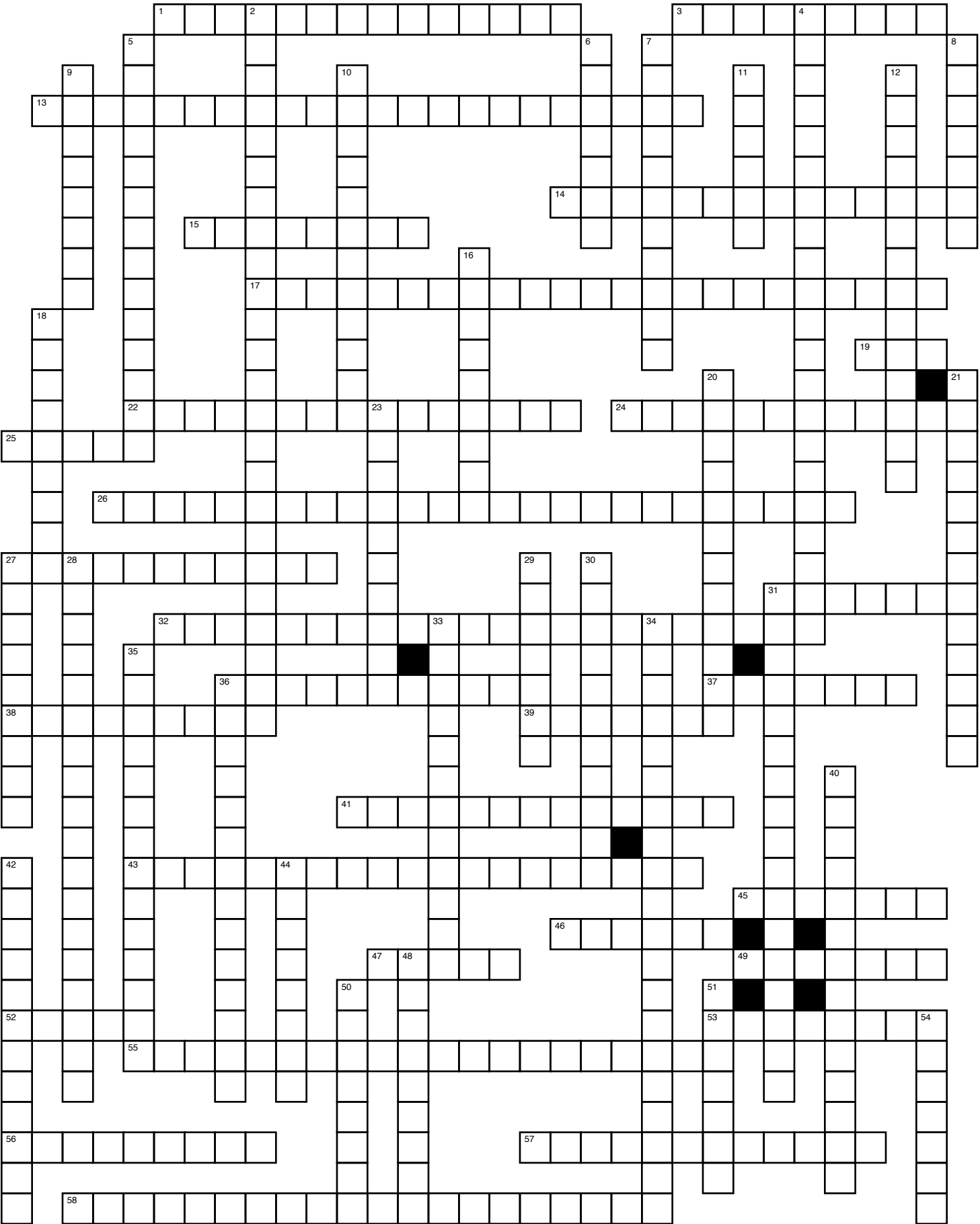
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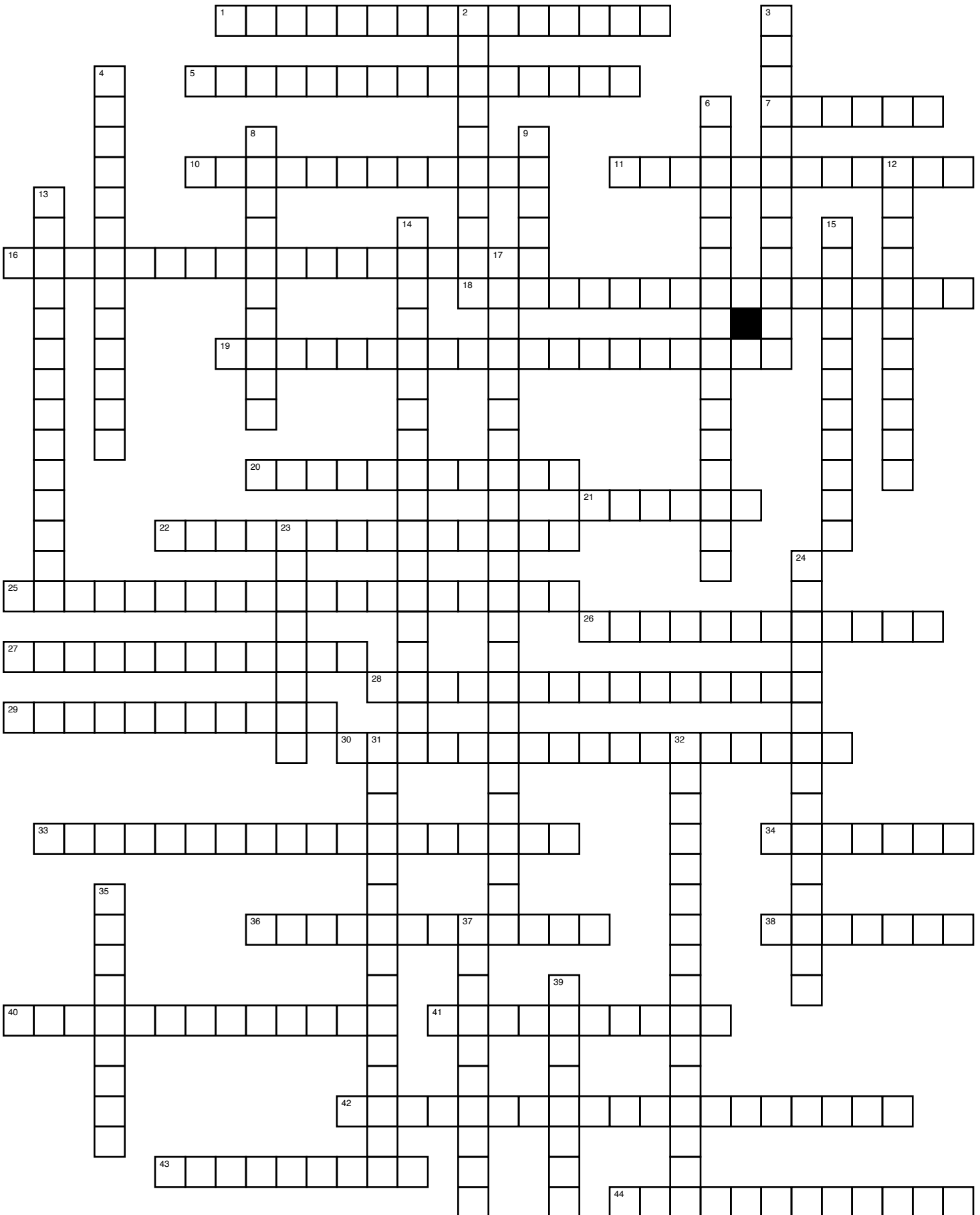




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Chapter 1

The Biochemical Basis of Life

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- ▶ a radioactive isotope of an element
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- ▶ an electron in the outermost energy level or shell of an atom (two words)
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- ▶ oriented in opposite directions
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Q	I	A	G	V	J	R	K	Q	K	I	A	K	C	B	H	K	V	V	F	A	Y	R	G	K	R	B	H	F	L	Y	W	E	O	Y
R	P	M	L	R	R	A	D	I	O	I	S	O	T	O	P	E	Q	M	X	Y	G	L	B	R	S	L	C	D	K	H	S	N	X	Q
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C	A	L	I	A	G	M	A	F	A	I	R	C	G	B	B	N	W	O	F	I	I	H	F	F	O	Z	T	Z	T	Q	N	E	N	O
A	I	F	C	C	S	Q	C	W	F	U	M	N	L	S	W	C	S	U	C	T	C	Y	P	M	S	I	R	U	J	O	F	T	E	L
C	U	U	B	T	T	V	C	C	S	Z	O	G	P	Y	H	B	A	A	X	C	T	O	T	A	S	V	A	I	I	E	F	I	B	Y
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O	E	U	S	A	G	I	P	H	C	N	E	N	I	D	A	G	I	A	B	Y	K	L	D	S	O	A	C	A	F	L	B	I	D	I
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E	I	X	A	E	Z	Z	L	D	D	D	M	H	R	Q	E	X	A	R	I	O	A	X	N	N	A	C	I	S	C	A	T	N	B	A
R	Z	H	R	D	J	E	P	Y	S	E	R	N	K	P	G	M	S	N	Q	L	D	C	A	K	R	H	O	F	T	Z	I	G	A	C
A	A	P	I	F	M	R	X	O	T	O	O	A	M	B	Q	O	H	U	S	Y	C	A	T	C	C	A	N	O	O	L	O	Z	L	T
Y	T	W	J	A	J	N	R	A	L	I	T	O	T	D	C	R	L	C	S	P	K	R	U	E	O	R	K	R	R	E	N	S	L	I
C	I	L	X	T	G	N	R	U	T	A	C	O	Q	E	Y	B	U	L	P	E	S	B	R	S	V	I	H	C	D	B	R	E	O	V
F	O	J	D	L	A	T	S	A	N	E	R	X	O	O	C	I	I	E	M	P	H	O	A	O	A	D	T	E	T	Y	S	A	S	E
E	N	P	Y	Y	S	N	R	E	D	H	R	I	D	B	Y	T	S	O	V	T	Q	H	T	D	L	E	D	S	P	O	R	X	T	S
V	E	Y	Z	B	R	D	I	I	X	B	B	K	T	H	Y	A	O	T	A	I	B	Y	I	C	E	M	H	U	R	B	U	Z	E	I
E	W	J	U	F	Y	M	T	O	J	B	Y	C	K	Y	W	L	T	I	N	D	U	D	O	W	N	O	I	P	O	Z	X	C	R	T
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C	Z	T	E	L	E	T	Q	U	N	G	T	G	H	R	C	O	P	E	S	I	F	A	Q	C	B	E	O	F	E	H	A	H	C	W
A	F	D	H	P	I	W	Z	W	Z	I	A	F	N	R	R	V	E	D	M	V	E	T	E	O	O	C	E	D	I	V	T	D	S	A
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P	C	Y	E	A	N	T	I	P	A	R	A	L	L	E	L	V	P	P	Q	N	G	G	Y	T	D	L	B	F	K	P	O	M	T	Q
H	L	I	P	I	D	P	H	Y	D	R	O	G	E	N	B	O	N	D	X	U	J	W	O	O	B	E	K	H	Z	X	N	J	E	G
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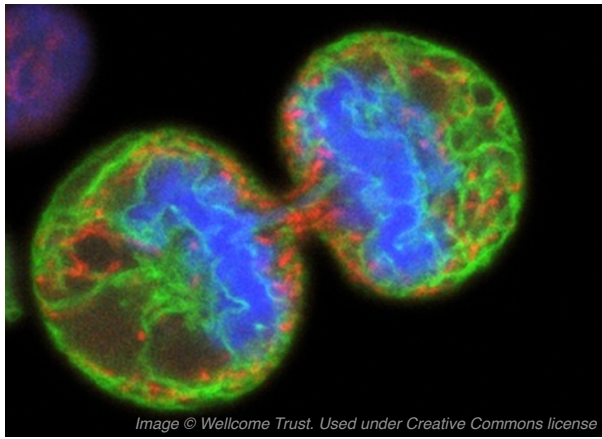


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Chapter 2

Cell Structure and Function

- ▶ a dynamic barrier that surrounds the cytosol of the cell (two words)
- ▶ a two-layer membrane that encloses the nucleus of a eukaryotic cell (two words)
- ▶ a group of interacting organelles between the nucleus and the plasma membrane (two words)
- ▶ a membrane-bound organelle that is folded into flattened sacs and tubes, and is often an outgrowth of the nuclear envelope in a eukaryotic cell (two words)
- ▶ areas of endoplasmic reticulum with ribosomes attached to the surface (two words)
- ▶ areas of endoplasmic reticulum without attached ribosomes (two words)
- ▶ a small, membrane-bound organelle that may transport, store, or digest substances within a cell
- ▶ a liquid-filled organelle that stores waste and aids in cellular metabolism and water balance
- ▶ a small, membrane-bound organelle that contains digestive enzymes, which aid in waste disposal
- ▶ an organelle with folded membranes where the final packaging of proteins occurs (two words)
- ▶ an organelle with two membranes; the site of most ATP synthesis during aerobic cellular respiration
- ▶ a membrane-bound organelle that is involved in photosynthesis and storage in plants and algae
- ▶ a double-membrane-bound organelle that contains enzymes and pigments, which are used to perform photosynthesis in eukaryotic cells
- ▶ an organelle that makes and stores pigments other than chlorophyll
- ▶ an organelle that stores starch
- ▶ a dynamic system of filaments that provides cell structure, helps with cell division, and enables the cell and inner organelles to move around
- ▶ a fibre structure that is made from actin, which is part of the cytoskeleton and is located in the cytosol of cells
- ▶ a whiplike tail that is used in propulsion of both prokaryotic and eukaryotic cells
- ▶ tiny hairlike structures that move water and mucus in eukaryotes; used for movement of prokaryotic cells
- ▶ the outer barrier of a plant cell; surrounds the plasma membrane and gives structure to the plant (two words)
- ▶ a cellulose coating that surrounds a plant cell (two words)
- ▶ a coating that is added to a plant cell wall; it is more rigid and often thicker than the primary cell wall (two words)
- ▶ a molecular system that supports and protects a cell; a cell's environment (two words)
- ▶ a structure that allows cells to interact with each other and the surrounding environment (two words)
- ▶ the idea that a biological membrane consists of a fluid phospholipid bilayer, in which proteins are embedded and float freely (three words)
- ▶ any membrane lipid that is bound to a carbohydrate
- ▶ a membrane component that contains a sugar, or carbohydrate, bound to an amino acid
- ▶ a type of steroid with an OH group at one end and a non-polar hydrocarbon chain at the other
- ▶ a protein that is embedded in the lipid bilayer (three words)
- ▶ a protein on the surface of the membrane (three words)
- ▶ the movement of a substance across a membrane without expending energy (two words)
- ▶ the state in which continuous action results in balanced conditions (two words)
- ▶ the ability of small and non-polar substances to move across a membrane unassisted (two words)
- ▶ the facilitated transport of ions and polar molecules through a membrane via protein complexes (two words)
- ▶ a hydrophilic pathway in a membrane that enables water and ions to pass through (two words)
- ▶ a protein that binds to a molecule and transports it across the lipid bilayer (two words)
- ▶ the passive diffusion of water across a membrane
- ▶ a solution that has a lower solute concentration than another solution
- ▶ a solution that has a higher solute concentration than another solution
- ▶ a solution that has the same solute concentration as another solution
- ▶ the movement of substances across membranes against their concentration gradient using pumps (two words)
- ▶ the combined effects of a difference in electrical potential energy and a difference in the concentration gradients of ions (two words)

I	D	B	S	Y	E	P	J	J	S	K	E	A	J	D	T	H	I	S	I	P	F	K	I	Y	B	G	J	G	D	Y	W
C	G	V	M	Q	H	S	M	O	O	T	H	E	R	O	V	J	U	F	N	V	B	S	I	O	X	J	O	S	V	K	T
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G	T	E	A	I	T	A	S	M	S	T	M	M	W	C	F	S	Z	H	R	M	F	O	M	O	O	V	X	P	N	B	L
Q	I	W	M	C	A	M	D	O	Y	X	O	M	W	S	H	U	B	C	I	Z	T	U	R	R	G	O	V	T	V	P	A
P	V	K	E	E	T	I	I	G	D	D	C	N	E	B	N	K	I	R	N	Y	L	P	P	R	N	S	N	M	H	E	S
N	E	O	N	L	E	C	E	E	X	T	O	I	I	B	G	M	P	O	C	L	O	E	Y	V	N	E	A	O	B	R	M
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O	K	H	L	E	S	S	S	N	T	S	H	O	M	H	Q	F	T	L	B	U	S	S	C	X	O	C	R	Y	Z	N	A
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T	W	R	T	Y	X	P	E	U	B	R	O	D	Z	U	M	R	Y	G	E	O	G	C	O	G	T	J	P	T	J	I	D
C	V	O	R	W	X	D	O	K	Q	S	K	L	E	Y	P	H	I	I	U	L	D	Q	I	S	G	N	E	Z	A	N	W
B	L	T	I	A	I	B	D	T	R	L	H	H	Q	V	G	S	Q	O	K	A	Z	E	L	N	O	G	P	N	C	B	P
X	X	E	X	L	K	Z	L	Z	X	N	O	S	M	O	S	I	S	U	N	U	N	J	L	J	V	M	L	H	S	X	N
G	J	I	O	L	O	U	U	G	S	M	O	C	A	R	R	I	E	R	P	R	O	T	E	I	N	Y	E	T	V	G	U
Y	U	N	P	J	F	U	J	J	S	P	Y	J	Y	N	H	E	Q	R	Q	O	M	J	X	X	V	E	S	I	C	L	E



Unit 1

Biochemistry

- ▶ a form of an element that differs in its number of electrons
- ▶ a radioactive isotope of an element
- ▶ a bond that results from the attraction between two oppositely charged atoms or molecules (two words)
- ▶ an ion that have a negative charge
- ▶ a bond between two atoms, made up of unequally shared electrons (three words)
- ▶ partial positive or negative charge at the ends of a molecule
- ▶ a reaction in which an acid and a base combine to create a salt and water (two words)
- ▶ a reaction in which a molecule loses electrons
- ▶ a reaction in which a molecule gains electrons
- ▶ the amount of thermal energy required to raise the temperature of a given quantity of a substance by 1 °C (two words)
- ▶ non-polar molecules that are not strongly attracted to water
- ▶ the process in which a molecule spontaneously dissociates into ions
- ▶ a molecule that has the same composition as another, but a different arrangement of atoms
- ▶ a carbohydrate molecule that is made from two monosaccharide units
- ▶ a bond between two monosaccharides (two words)
- ▶ a molecule that contains many linked monosaccharides (two words)
- ▶ a process in which small subunits are linked to form a large molecule
- ▶ a small molecule that can bind chemically to other molecules
- ▶ a large molecule that is formed when monomers link together chemically in a chain
- ▶ a non-polar compound that is made mostly of carbon and hydrogen
- ▶ a molecule that consists of a carboxyl group and a hydrocarbon chain (two words)
- ▶ a fat; three fatty acid chains linked to a glycerol molecule
- ▶ a lipid that is composed of saturated fatty acids with single bonds in their hydrocarbon chain (two words)
- ▶ a lipid that is composed of unsaturated fatty acids with double bonds in the hydrocarbon chain (two words)
- ▶ a lipid that is composed of four carbon rings
- ▶ a lipid that is formed when long fatty acid chains are joined to alcohols or carbon rings
- ▶ a large molecule that consists of many amino acid subunits, which are joined together by peptide bonds folded into a specific three-dimensional shape
- ▶ a chain of amino acid subunits, which are connected by peptide bonds
- ▶ a peptide with more that 50 amino acids
- ▶ the building block of nucleic acids; consists of a 5-carbon sugar, a nitrogenous base, and one to three phosphate groups
- ▶ oriented in opposite directions
- ▶ an organic molecule that acts as a cofactor of an enzyme
- ▶ a situation in which a competitor substance binds to a normal substrate binding site to block enzyme activity (two words)
- ▶ a situation in which molecules bind to an enzyme at a site that is not the active site, thus blocking enzyme activity (two words)
- ▶ a binding site on an enzyme that binds regulatory molecules (two words)
- ▶ the regulation of one site of a protein by binding to another site on the same protein (two words)
- ▶ a dynamic barrier that surrounds the cytosol of the cell (two words)
- ▶ a two-layer membrane that encloses the nucleus of a eukaryotic cell (two words)
- ▶ a membrane-bound organelle that is folded into flattened sacs and tubes, and is often an outgrowth of the nuclear envelope in a eukaryotic cell (two words)
- ▶ areas of endoplasmic reticulum with ribosomes attached to the surface (two words)
- ▶ areas of endoplasmic reticulum without attached ribosomes (two words)
- ▶ a liquid-filled organelle that stores waste and aids in cellular metabolism and water balance
- ▶ a small, membrane-bound organelle that contains digestive enzymes, which aid in waste disposal
- ▶ an organelle with folded membranes where the final packaging of proteins occurs (two words)
- ▶ a membrane-bound organelle that is involved in photosynthesis and storage in plants and algae
- ▶ a double-membrane-bound organelle that contains enzymes and pigments, which are used to perform photosynthesis in eukaryotic cells
- ▶ an organelle that makes and stores pigments other than chlorophyll
- ▶ a fibre structure that is made from actin, which is part of the cytoskeleton and is located in the cytosol of cells
- ▶ a whiplike tail that is used in propulsion of both prokaryotic and eukaryotic cells
- ▶ tiny hairlike structures that move water and mucus in eukaryotes; used for movement of prokaryotic cells
- ▶ the outer barrier of a plant cell; surrounds the plasma membrane and gives structure to the plant (two words)
- ▶ a coating that is added to a plant cell wall; it is more rigid and often thicker than the primary cell wall (two words)
- ▶ a molecular system that supports and protects a cell; a cell's environment (two words)
- ▶ a type of steroid with an OH group at one end and a non-polar hydrocarbon chain at the other
- ▶ a protein that is embedded in the lipid bilayer (three words)
- ▶ a protein on the surface of the membrane (three words)
- ▶ the state in which continuous action results in balanced conditions (two words)
- ▶ the facilitated transport of ions and polar molecules through a membrane via protein complexes (two words)
- ▶ a hydrophilic pathway in a membrane that enables water and ions to pass through (two words)
- ▶ the passive diffusion of water across a membrane
- ▶ a solution that has a lower solute concentration than another solution

F	M	P	Y	X	P	M	R	E	M	O	N	O	M	M	M	L	Q	D	C	A	N	T	I	P	A	R	A	L	L	E	L
B	J	Z	I	T	S	P	E	P	X	C	E	H	X	R	O	K	J	N	H	Z	N	N	I	M	S	S	Y	U	V	N	F
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R	A	U	N	S	A	T	U	R	A	T	E	D	F	A	T	Z	E	L	L	V	V	C	O	Z	P	C	N	A	L	L	E
A	E	A	Q	A	C	N	I	E	T	O	R	P	T	Y	K	P	N	L	N	E	V	P	W	P	O	M	H	C	O	K	P
N	D	I	O	R	E	T	S	E	P	A	F	I	D	M	B	K	K	A	Q	M	C	M	X	U	R	Q	Z	T	G	T	T
E	I	S	I	S	O	M	S	O	M	L	H	T	G	T	X	X	J	O	Y	H	V	U	L	Y	O	H	W	I	A	R	I
P	F	F	U	S	F	O	D	F	J	R	U	X	H	I	X	L	Q	N	T	L	J	S	L	R	L	K	Y	O	X	T	D
R	L	M	Z	M	M	V	N	U	C	L	E	O	T	I	D	E	M	Z	H	Q	S	C	H	E	H	G	X	N	O	T	E
O	W	S	A	N	O	I	S	U	F	F	I	D	D	E	T	A	T	I	L	I	C	A	F	P	C	Q	U	P	E	I	F
T	Y	C	U	I	E	X	T	R	A	C	E	L	L	U	L	A	R	M	A	T	R	I	X	G	U	B	R	N	X	P	Z
E	B	A	S	N	O	I	T	A	Z	I	R	E	M	Y	L	O	P	S	E	C	O	N	D	A	R	Y	W	A	L	L	P
I	L	V	S	D	I	C	A	Y	T	T	A	F	S	O	T	N	E	M	A	L	I	F	O	R	C	I	M	T	E	X	G
N	I	L	Z	P	Y	E	C	C	U	P	B	P	X	R	R	E	H	G	U	O	R	O	T	F	M	X	C	Z	Z	F	H
L	X	A	S	Q	B	P	E	N	D	O	P	L	A	S	M	I	C	R	E	T	I	C	U	L	U	M	O	P	F	B	Y



Unit 1

Biochemistry

- ▶ a region of space that is occupied by electrons located around the nucleus of an atom
- ▶ an electron in the outermost energy level or shell of an atom (two words)
- ▶ an ion that has a positive charge
- ▶ the measure of an atom's attraction to shared electrons
- ▶ force of attraction between two molecules (two words)
- ▶ very weak attractions between two molecules, or parts of molecules when they are close together (four words)
- ▶ attractive force between a partially positively charged hydrogen atom, and a partially negatively charged atom in another molecule (two words)
- ▶ a chemical reaction in which subunits of a larger molecule are joined by the removal of water; also called a condensation reaction (two words)
- ▶ a chemical reaction in which water is used as a reactant to split a larger molecule into smaller subunits (two words)
- ▶ an electron transfer reaction (two words)
- ▶ polar or charged molecules that are strongly attracted to water
- ▶ a chemical that compensates for pH changes in a solution by accepting or donating H^+ ions
- ▶ a group of atoms that affects the function of a molecule by participating in chemical reactions (two words)
- ▶ a biomolecule that consists of carbon, oxygen, and hydrogen
- ▶ the simplest form of carbohydrate, consisting of a single sugar unit; building block for more complex carbohydrates
- ▶ a molecule that is comprised of hundreds to thousands of monosaccharides linked together; an essential part of nutrition and a valuable energy source (two words)
- ▶ a lipid that consists of two fatty acids and a phosphate group bound to glycerol
- ▶ a blueprint for proteins that are synthesized in cells; stores hereditary information (two words)
- ▶ a molecule that contains a carboxyl group and an amino group; serves as the monomer subunit of proteins (two words)
- ▶ a covalent bond that links amino acids (two words)
- ▶ the loss of both the structure and function of a protein
- ▶ a biological catalyst, usually a protein, that speed up a chemical reaction
- ▶ a substance that is recognized by and binds to an enzyme
- ▶ a pocket or groove in an enzyme that binds its substrate (two words)
- ▶ a model of enzyme activity that describes how an enzyme changes shape to better accommodate a substrate (two words)
- ▶ a non-protein group that binds to an enzyme and is essential for catalytic activity
- ▶ the regulation of a pathway by one of the products of this pathway (two words)
- ▶ a group of interacting organelles between the nucleus and the plasma membrane (two words)
- ▶ a small, membrane-bound organelle that may transport, store, or digest substances within a cell
- ▶ an organelle with two membranes; the site of most ATP synthesis during aerobic cellular respiration
- ▶ an organelle that stores starch
- ▶ a dynamic system of filaments that provides cell structure, helps with cell division, and enables the cell and inner organelles to move around
- ▶ a cellulose coating that surrounds a plant cell (two words)
- ▶ a structure that allows cells to interact with each other and the surrounding environment (two words)
- ▶ the idea that a biological membrane consists of a fluid phospholipid bilayer, in which proteins are embedded and float freely (three words)
- ▶ any membrane lipid that is bound to a carbohydrate
- ▶ a membrane component that contains a sugar, or carbohydrate, bound to an amino acid
- ▶ the movement of a substance across a membrane without expending energy (two words)
- ▶ the ability of small and non-polar substances to move across a membrane unassisted (two words)
- ▶ a protein that binds to a molecule and transports it across the lipid bilayer (two words)
- ▶ a solution that has a higher solute concentration than another solution
- ▶ a solution that has the same solute concentration as another solution
- ▶ the movement of substances across membranes against their concentration gradient using pumps (two words)
- ▶ the combined effects of a difference in electrical potential energy and a difference in the concentration gradients of ions (two words)

G	L	Y	C	O	P	R	O	T	E	I	N	B	H	R	D	N	O	B	N	E	G	O	R	D	Y	H	I	H	W	F	B
A	C	R	B	O	E	T	D	J	P	V	T	O	G	D	K	A	R	B	K	Q	D	S	E	D	B	D	K	Y	C	V	W
E	O	F	U	P	O	C	N	O	R	T	C	E	L	E	E	C	N	A	L	A	V	G	O	I	P	I	P	D	A	C	O
J	U	N	F	M	O	N	O	S	A	C	C	H	A	R	I	D	E	H	M	V	L	I	M	F	F	P	M	R	C	Z	O
J	R	Y	F	W	U	V	O	P	Z	P	Q	F	M	B	E	N	Z	Y	M	E	K	F	G	M	L	I	V	O	T	L	A
Y	A	K	E	T	T	Q	M	G	S	S	H	W	P	U	V	G	Q	B	G	M	U	S	V	E	G	L	N	L	I	N	C
M	X	J	R	I	V	Y	T	E	C	E	X	O	Y	T	Z	F	O	R	Y	Y	T	C	D	B	C	O	E	Y	V	H	T
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X	I	Q	T	F	T	L	V	S	F	Y	B	B	J	E	Z	C	L	F	F	V	D	C	M	C	K	O	R	E	E	A	R
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P	G	Q	I	B	M	I	G	P	R	P	V	R	D	B	V	O	P	B	N	B	W	U	L	M	R	C	G	L	M	A	Y
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K	K	Z	F	F	C	B	J	O	J	C	L	R	W	E	D	Y	W	H	U	Q	S	N	Y	R	A	S	E	R	N	K	L
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R	O	H	O	I	F	F	I	R	U	U	Q	J	V	A	K	D	D	L	Y	Q	U	B	V	T	L	V	R	E	I	N	O
D	U	T	T	S	Y	K	M	U	Y	L	K	E	Z	V	P	K	X	X	N	D	Q	N	W	A	J	F	A	Y	D	M	T
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C	D	G	J	Q	C	A	L	E	T	V	F	O	E	W	F	Z	A	N	O	I	T	C	N	U	J	L	L	E	C	X	J
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I	P	Q	K	J	C	D	Z	Q	G	V	A	N	D	E	R	W	A	A	L	S	F	O	R	C	E	S	N	A	F	V	Y
M	S	U	B	S	T	R	A	T	E	F	U	N	C	T	I	O	N	A	L	G	R	O	U	P	C	S	E	J	J	H	X



Image © Robert Prior

Chapter 3

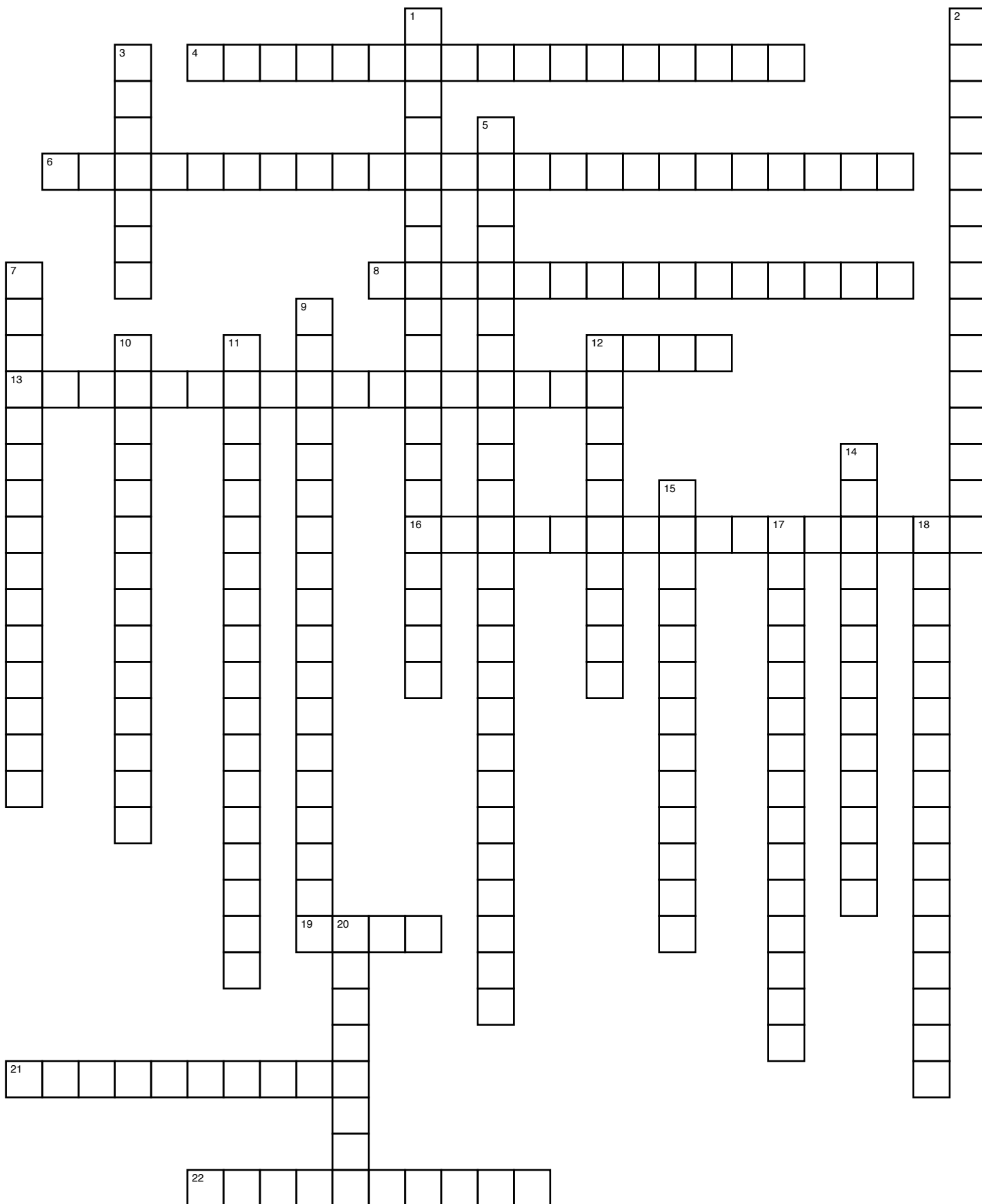
An Introduction to Metabolism

Across

4. a chemical reaction that releases free energy; the products have less free energy than the reactants (two words)
6. principle that states that energy can be transferred or transformed, but it cannot be created or destroyed (four words)
8. a temporary condition during a chemical reaction in which the bonds in the reactants are breaking and the bonds in the products are forming (two words)
12. the number of atoms or molecules whose mass in grams is equal to the atomic mass of one such particle in atomic mass units; one carbon atom has a mass of 12 AU, and therefore one mole of carbon atoms has a mass of 12 g
13. a change that will, once begun, continue on its own under a given set of conditions; does not require a continuous supply of energy (two words)
16. a pathway in which energy is released and complex molecules are broken down into simple molecules (two words)
19. the reduced form of the coenzyme nicotinamide adenine dinucleotide
21. energy that can do useful work (two words)
22. the minimum amount of energy that is required to break a particular type of bond; measured in kJ/mol of bonds (two words)

Down

1. a chemical reaction in which energy is absorbed, giving the products more chemical potential energy than the reactants (two words)
2. the stored energy that an object possesses as a result of its position relative to other objects or to its internal structure (two words)
3. a measurement of disorder in a system
5. principle that states that every time energy is converted to another form, some of the energy becomes unusable (four words)
7. the transfer of a phosphate group, usually from ATP, to another molecule
9. a chemical reaction in which energy is released, leaving the products with less chemical potential energy than the reactants (two words)
10. the transfer of energy from one reaction to another in order to drive the second reaction (two words)
11. a chemical reaction that absorbs free energy; the products have more free energy than the reactants (two words)
12. the sum of all chemical reactions in a cell or organism
14. an enzyme that oxidizes a substrate and transfers hydrogen ions to an acceptor
15. the energy of motion (two words)
17. a pathway in which energy is supplied to build complex molecules from simple molecules (two words)
18. the minimum amount of energy that chemical reactants must absorb to start a reaction (two words)
20. the cyclic and ongoing breakdown and re-synthesis of ATP (two words)



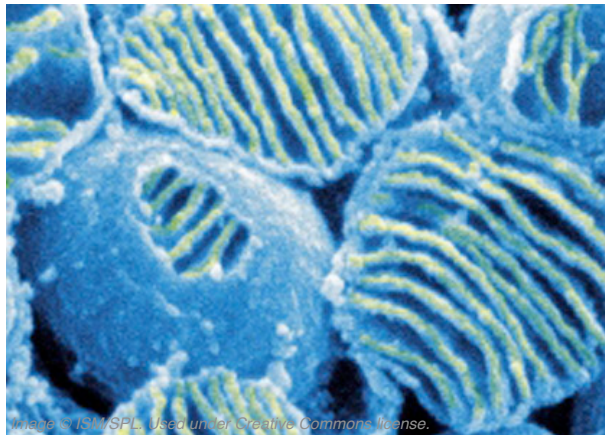


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Chapter 4

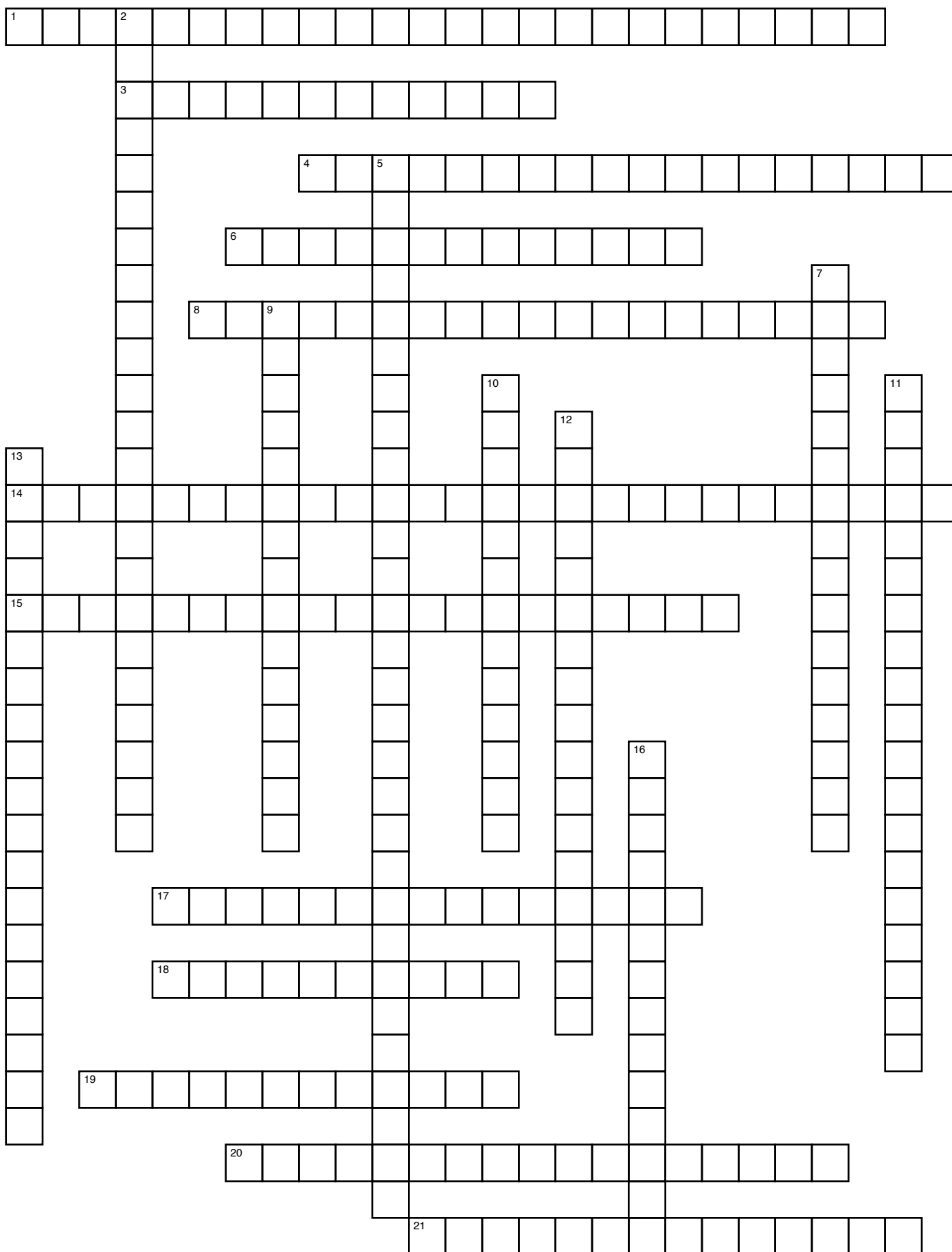
Cellular Respiration

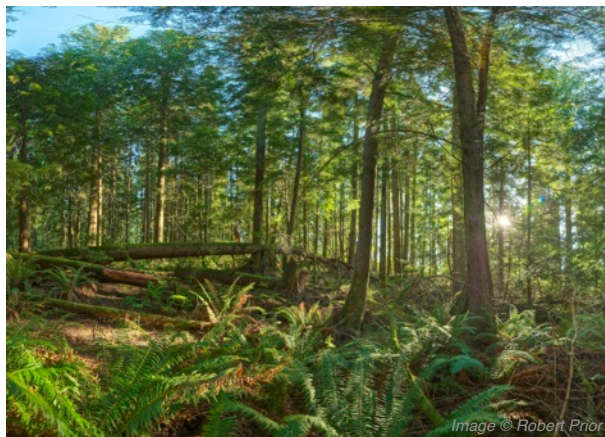
Across

1. a process that forms ATP using energy transferred indirectly from a series of redox reactions (two words)
3. a process in which ATP is synthesized using the energy of an electrochemical gradient and the ATP synthase enzyme
4. the metabolic rate of an organism at rest (three words)
6. the amount of energy that is expended per unit time in an organism (two words)
8. an organism that can live with or without oxygen (two words)
14. a process that uses oxygen to harvest energy from organic compounds (three words)
15. a process that uses a final inorganic oxidizing agent, other than oxygen, to produce energy (two words)
17. the removal of a hydrogen atom from a molecule
18. a series of reactions in which a glucose molecule is broken into two pyruvate molecules and energy is released
19. a process that uses an organic compound as the final oxidizing agent to produce energy
20. a force that moves protons because of a chemical gradient (often referred to as an electrochemical gradient) of protons across a membrane (two words)
21. an organism that cannot live without oxygen (two words)
11. a process in which pyruvate is decarboxylated, producing a molecule of CO_2 , ethanol, and an NAD^+ (two words)
12. a reaction in which pyruvate is oxidized by NAD^+ and CO_2 is removed, forming an acetyl group and releasing NADP (two words)
13. a process in which pyruvate reacts with NADH and is converted directly into lactate and regenerates NAD^+ (two words)
16. a difference in proton (H^+ ion) concentration across a membrane (two words)

Down

2. a chemical reaction that removes a carboxyl group to form CO_2 (two words)
5. the formation of ATP by the direct transfer of a phosphate group from a substrate to ADP (two words)
7. an organism that cannot survive in the presence of oxygen (two words)
9. a cyclic series of reactions that transfers energy from organic molecules to ATP, NADH, and FADH_2 and releases carbon atoms as CO_2 (three words)
10. a process in which fatty acids are broken down into acetyl-CoA through catabolism





Chapter 5

Photosynthesis: The Energy of Life

Across

2. a collection of pigment proteins that includes chlorophyll *a* and absorbs light at the 680 nm wavelength (two words)
3. an organism that makes its own food using energy from the Sun
4. a collection of pigment proteins that includes chlorophyll *a* and absorbs light at the 700 nm wavelength (two words)
6. the catalysis of O_2 instead of CO_2 by rubisco into RuBP, which slows the Calvin cycle, consumes ATP, and results in a release of carbon
7. small pores in the surface of a leaf that can be opened and closed to control the exchange of gases between the atmosphere and the leaf interior
11. an alternate form of carbon fixation that some plants use, particularly in hot weather, to increase the concentration of CO_2 available for the Calvin cycle reactions (two words)
12. a molecule capable of accepting electrons and becoming reduced during photosynthesis (three words)
13. a metabolic pathway, used mostly by succulent plants, in which the Calvin cycle and the C_4 cycle are separated in time for better efficiency of CO_2 fixation (three words)
14. ribulose 1,5-bisphosphate carboxylase oxygenase; a critical enzyme that acts as a catalyst for the reduction of carbon dioxide in the Calvin cycle of photosynthesis
15. the second stage of the photosynthesis process that uses ATP and NADPH to convert CO_2 to sugars (two words)

Down

1. the first stage of photosynthesis, during which water molecules are split as light energy is absorbed and transformed into chemical energy in ATP and NADPH (two words)
5. a complex of proteins and pigments that contain the primary electron acceptor (two words)
8. a plot of the amount of light energy of various wavelengths that a substance absorbs (two words)
9. a plot of the effectiveness of light energy of different wavelengths in driving a chemical process (two words)
10. a cluster of light-absorbing pigments embedded in the thylakoid membrane able to capture and transfer energy to special chlorophyll *a* molecules in the reaction centre (two words)

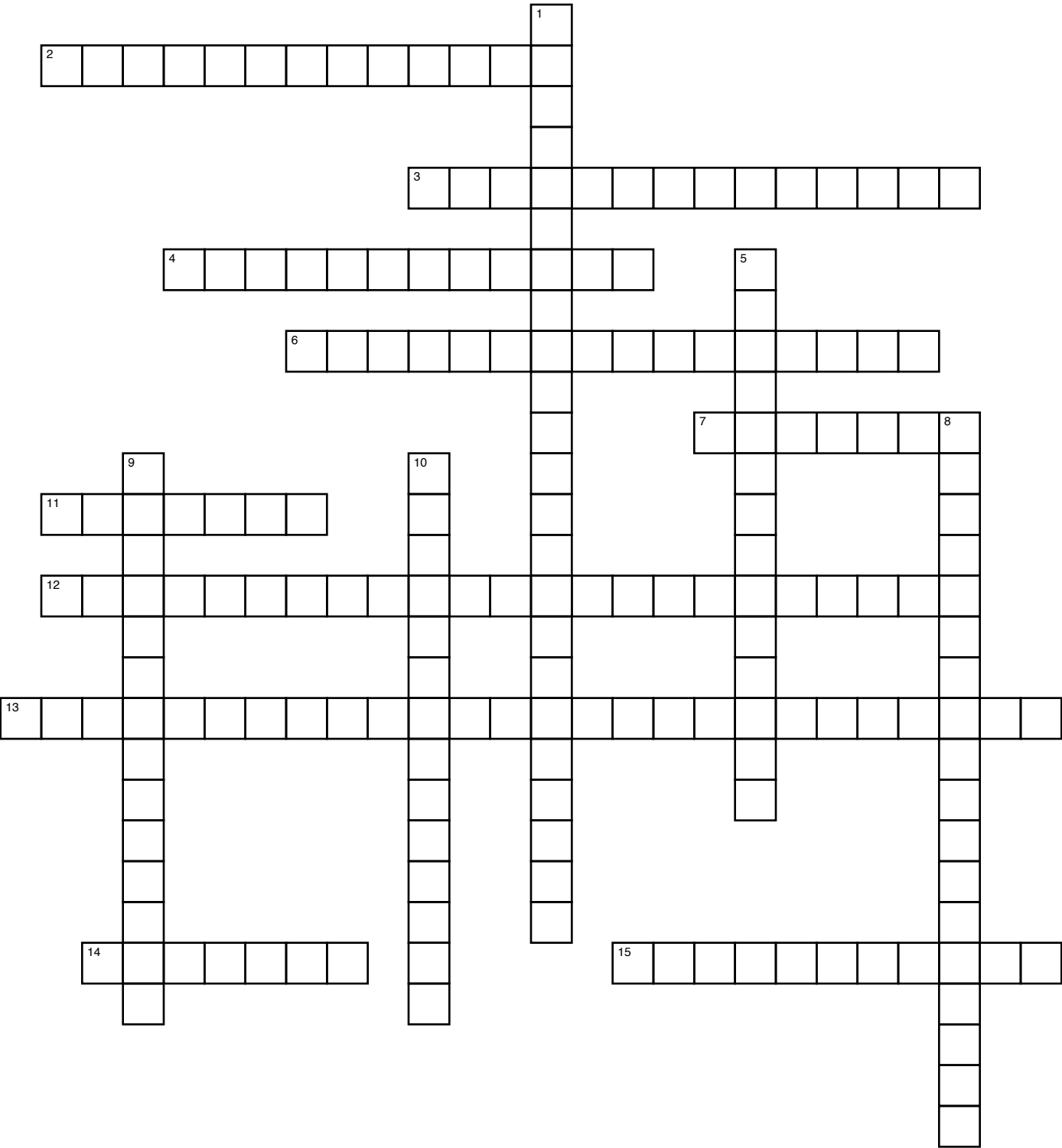




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Unit 2 Metabolic Processes

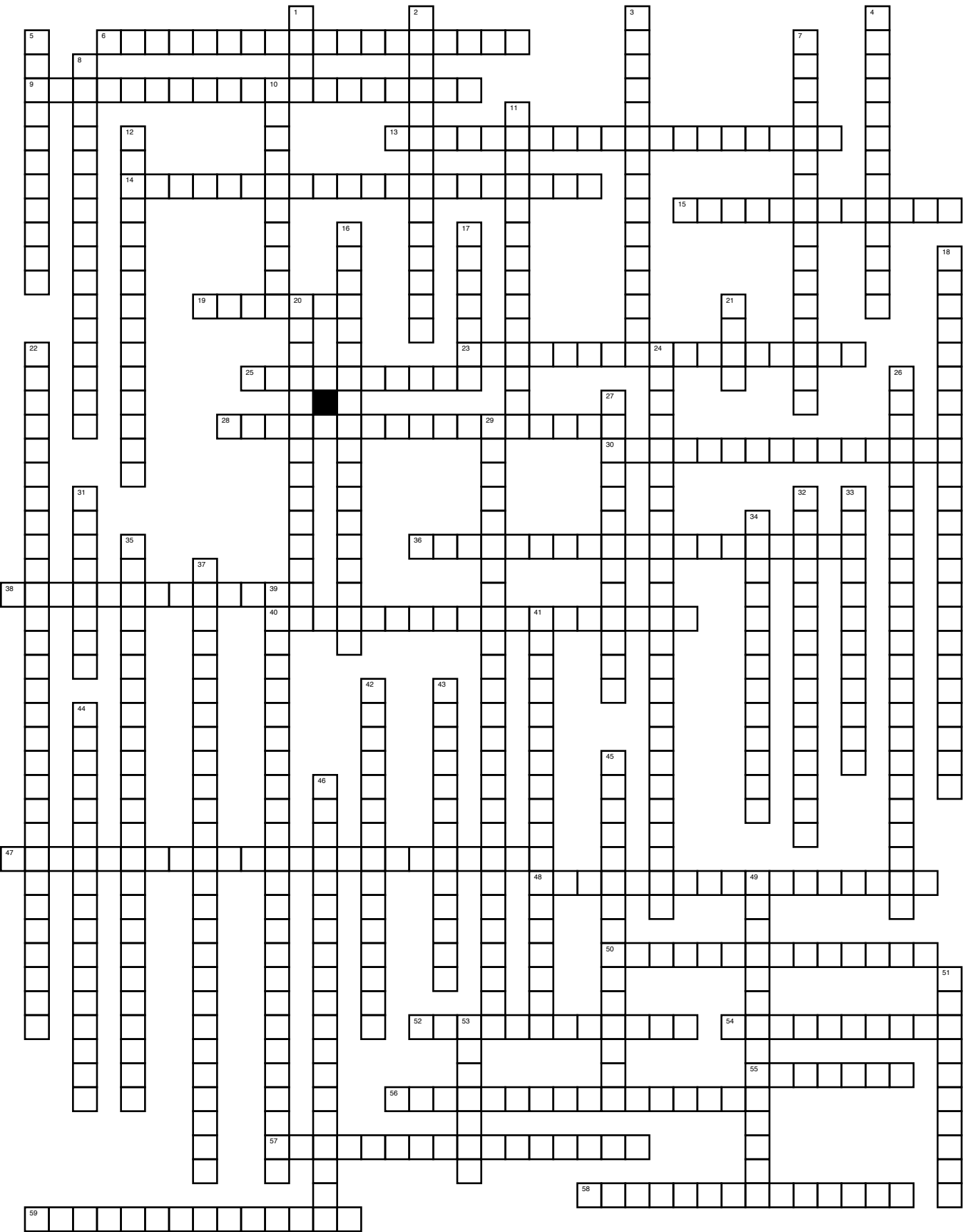
Across

6. a plot of the amount of light energy of various wavelengths that a substance absorbs (two words)
9. a process in which pyruvate reacts with NADH and is converted directly into lactate and regenerates NAD⁺ (two words)
13. a chemical reaction in which energy is absorbed, giving the products more chemical potential energy than the reactants (two words)
14. a process that uses a final inorganic oxidizing agent, other than oxygen, to produce energy (two words)
15. a collection of pigment proteins that includes chlorophyll *a* and absorbs light at the 700 nm wavelength (two words)
19. small pores in the surface of a leaf that can be opened and closed to control the exchange of gases between the atmosphere and the leaf interior
23. a reaction in which pyruvate is oxidized by NAD⁺ and CO₂ is removed, forming an acetyl group and releasing NADP (two words)
25. energy that can do useful work (two words)
28. a change that will, once begun, continue on its own under a given set of conditions; does not require a continuous supply of energy (two words)
30. a temporary condition during a chemical reaction in which the bonds in the reactants are breaking and the bonds in the products are forming (two words)
36. an organism that can live with or without oxygen (two words)
38. an enzyme that oxidizes a substrate and transfers hydrogen ions to an acceptor
40. a chemical reaction in which energy is released, leaving the products with less chemical potential energy than the reactants (two words)
47. a molecule capable of accepting electrons and becoming reduced during photosynthesis (three words)
48. a chemical reaction that releases free energy; the products have less free energy than the reactants (two words)
50. the transfer of energy from one reaction to another in order to drive the second reaction (two words)
52. a process that uses an organic compound as the final oxidizing agent to produce energy
54. the minimum amount of energy that is required to break a particular type of bond; measured in kJ/mol of bonds (two words)
55. an alternate form of carbon fixation that some plants use, particularly in hot weather, to increase the concentration of CO₂ available for the Calvin cycle reactions (two words)

56. an organism that cannot survive in the presence of oxygen (two words)
57. a pathway in which energy is released and complex molecules are broken down into simple molecules (two words)
58. an organism that cannot live without oxygen (two words)
59. a difference in proton (H⁺ ion) concentration across a membrane (two words)

Down

1. the number of atoms or molecules whose mass in grams is equal to the atomic mass of one such particle in atomic mass units; one carbon atom has a mass of 12 AU, and therefore one mole of carbon atoms has a mass of 12 g
2. a plot of the effectiveness of light energy of different wavelengths in driving a chemical process (two words)
3. a cyclic series of reactions that transfers energy from organic molecules to ATP, NADH, and FADH₂ and releases carbon atoms as CO₂ (three words)
4. a collection of pigment proteins that includes chlorophyll *a* and absorbs light at the 680 nm wavelength (two words)
5. the second stage of the photosynthesis process that uses ATP and NADPH to convert CO₂ to sugars (two words)
7. the catalysis of O₂ instead of CO₂ by rubisco into RuBP, which slows the Calvin cycle, consumes ATP, and results in a release of carbon
8. the minimum amount of energy that chemical reactants must absorb to start a reaction (two words)
10. the sum of all chemical reactions in a cell or organism
11. an organism that makes its own food using energy from the Sun
12. a pathway in which energy is supplied to build complex molecules from simple molecules (two words)
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31. the cyclic and ongoing breakdown and re-synthesis of ATP (two words)
32. the transfer of a phosphate group, usually from ATP, to another molecule
33. a process in which ATP is synthesized using the energy of an electrochemical gradient and the ATP synthase enzyme
34. the amount of energy that is expended per unit time in an organism (two words)
35. principle that states that energy can be transferred or transformed, but it cannot be created or destroyed (four words)
37. a process that uses oxygen to harvest energy from organic compounds (three words)
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41. a chemical reaction that absorbs free energy; the products have more free energy than the reactants (two words)
42. the stored energy that an object possesses as a result of its position relative to other objects or to its internal structure (two words)
43. the energy of motion (two words)
44. a force that moves protons because of a chemical gradient (often referred to as an electrochemical gradient) of protons across a membrane (two words)
45. the removal of a hydrogen atom from a molecule
46. a process in which pyruvate is decarboxylated, producing a molecule of CO₂, ethanol, and an NAD⁺ (two words)
49. a complex of proteins and pigments that contain the primary electron acceptor (two words)
51. a series of reactions in which a glucose molecule is broken into two pyruvate molecules and energy is released
53. ribulose 1,5-bisphosphate carboxylase oxygenase; a critical enzyme that acts as a catalyst for the reduction of carbon dioxide in the Calvin cycle of photosynthesis





Chapter 3

An Introduction to Metabolism

- ▶ the sum of all chemical reactions in a cell or organism
- ▶ the energy of motion (two words)
- ▶ the stored energy that an object possesses as a result of its position relative to other objects or to its internal structure (two words)
- ▶ principle that states that energy can be transferred or transformed, but it cannot be created or destroyed (four words)
- ▶ the minimum amount of energy that is required to break a particular type of bond; measured in kJ/mol of bonds (two words)
- ▶ the number of atoms or molecules whose mass in grams is equal to the atomic mass of one such particle in atomic mass units; one carbon atom has a mass of 12 AU, and therefore one mole of carbon atoms has a mass of 12 g
- ▶ the minimum amount of energy that chemical reactants must absorb to start a reaction (two words)
- ▶ a temporary condition during a chemical reaction in which the bonds in the reactants are breaking and the bonds in the products are forming (two words)
- ▶ a chemical reaction in which energy is released, leaving the products with less chemical potential energy than the reactants (two words)
- ▶ a chemical reaction in which energy is absorbed, giving the products more chemical potential energy than the reactants (two words)
- ▶ principle that states that every time energy is converted to another form, some of the energy becomes unusable (four words)
- ▶ a measurement of disorder in a system
- ▶ a change that will, once begun, continue on its own under a given set of conditions; does not require a continuous supply of energy (two words)
- ▶ energy that can do useful work (two words)
- ▶ a chemical reaction that releases free energy; the products have less free energy than the reactants (two words)
- ▶ a chemical reaction that absorbs free energy; the products have more free energy than the reactants (two words)
- ▶ the transfer of energy from one reaction to another in order to drive the second reaction (two words)
- ▶ a pathway in which energy is released and complex molecules are broken down into simple molecules (two words)
- ▶ a pathway in which energy is supplied to build complex molecules from simple molecules (two words)
- ▶ the transfer of a phosphate group, usually from ATP, to another molecule
- ▶ the cyclic and ongoing breakdown and re-synthesis of ATP (two words)
- ▶ an enzyme that oxidizes a substrate and transfers hydrogen ions to an acceptor
- ▶ the reduced form of the coenzyme nicotinamide adenine dinucleotide

F	P	G	P	X	V	N	O	I	T	C	A	E	R	C	I	N	O	G	R	E	D	N	E	O	J	P
K	W	O	V	H	Y	O	X	N	Q	H	Y	E	F	F	H	N	Q	O	G	O	E	A	Z	N	S	B
Y	K	Y	L	E	R	E	Q	A	C	T	I	V	A	T	I	O	N	E	N	E	R	G	Y	Y	W	C
Z	B	G	Y	L	M	X	H	N	O	I	T	C	A	E	R	C	I	M	R	E	H	T	O	D	N	E
B	I	P	V	D	M	E	G	K	E	V	U	H	H	K	Y	Q	P	C	N	W	F	A	M	Z	K	H
X	P	N	Y	D	G	Y	E	E	U	K	A	C	K	H	D	X	N	L	M	K	Q	N	P	B	Q	B
M	K	F	H	R	R	B	A	Z	X	N	K	O	Y	O	L	R	Y	P	O	R	T	N	E	N	V	P
S	K	O	A	C	Q	I	V	S	C	S	S	U	A	A	F	C	W	E	Z	F	B	Z	A	E	D	R
I	U	C	R	O	J	Z	N	L	Q	Y	J	O	W	X	X	P	Q	O	W	A	E	X	M	Y	R	X
L	S	E	C	O	N	D	L	A	W	O	F	T	H	E	R	M	O	D	Y	N	A	M	I	C	S	F
O	Y	D	A	N	A	B	O	L	I	C	P	A	T	H	W	A	Y	V	B	A	E	V	K	Y	I	G
B	P	D	U	I	P	H	R	H	X	D	S	B	A	P	R	I	F	O	E	D	T	B	U	R	P	J
A	H	N	L	G	L	O	U	V	O	J	H	F	P	J	Y	R	Z	M	K	J	V	C	S	X	V	L
T	O	M	O	N	R	M	Q	Y	F	D	S	B	C	G	D	A	B	S	W	E	O	T	P	Q	M	N
E	S	H	P	I	E	H	Q	E	M	R	J	V	I	M	V	N	N	U	N	Y	L	Y	E	M	L	P
M	P	N	X	L	T	V	K	M	B	M	W	T	L	N	E	T	R	R	U	A	N	U	X	J	J	O
G	H	A	G	P	A	C	F	H	W	O	E	U	O	P	G	N	Z	M	W	V	E	E	E	E	P	T
J	O	D	I	U	T	I	A	K	U	W	I	V	B	V	V	S	L	O	O	E	G	J	R	L	O	E
A	R	H	F	O	S	E	J	E	X	W	F	G	A	C	S	O	F	B	F	B	N	X	G	N	O	N
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H	T	Y	U	R	T	T	R	A	H	N	W	M	R	B	E	Z	S	M	U	D	S	W	C	E	R	L
A	I	Y	W	E	I	E	A	N	N	Y	Q	M	R	N	Z	Y	W	U	J	F	U	R	R	T	L	E
T	O	J	E	N	S	Y	J	L	T	E	O	Q	E	E	H	P	R	O	O	U	O	P	E	I	B	N
P	N	J	N	E	N	I	Q	S	J	D	G	R	D	V	H	P	O	A	I	T	E	A	A	C	O	E
C	G	F	K	Q	A	V	Q	E	Y	Z	G	O	K	K	Y	T	W	O	B	M	N	F	C	E	N	R
Y	M	D	M	O	R	O	D	N	M	Y	L	Q	R	C	X	W	O	D	W	U	A	C	T	N	D	G
C	J	Z	I	T	T	P	A	P	X	C	E	H	X	D	O	K	J	X	H	Z	T	N	I	E	E	Y
L	U	V	G	F	S	M	H	S	C	J	N	D	E	N	Y	R	R	U	E	C	N	Q	O	R	N	H
E	K	X	B	C	I	U	W	U	B	I	V	Y	H	J	G	H	X	V	B	H	O	W	N	G	E	Z
R	O	C	B	C	R	V	J	W	M	O	L	E	M	Y	F	U	E	K	P	M	P	T	B	Y	R	U
T	G	S	S	J	J	W	X	P	P	M	K	K	H	C	N	N	N	D	K	E	S	P	G	L	G	A
W	I	J	W	B	G	N	Q	V	N	Z	C	O	S	W	H	R	L	T	O	A	P	P	Y	Z	Y	P

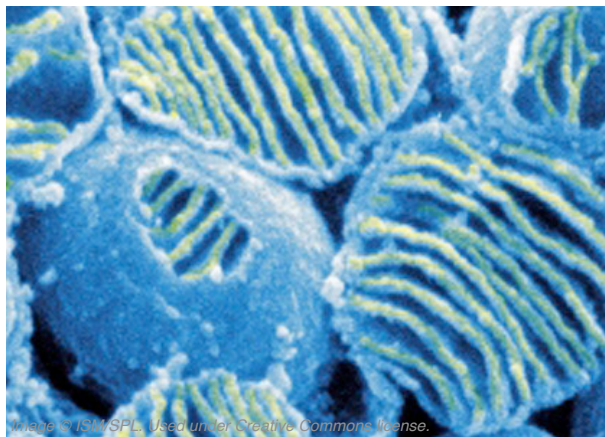


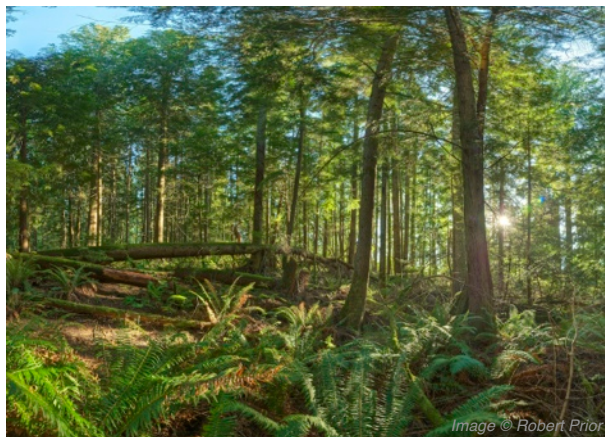
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Chapter 4

Cellular Respiration

- ▶ a process that uses oxygen to harvest energy from organic compounds (three words)
- ▶ an organism that cannot live without oxygen (two words)
- ▶ the formation of ATP by the direct transfer of a phosphate group from a substrate to ADP (two words)
- ▶ a process that forms ATP using energy transferred indirectly from a series of redox reactions (two words)
- ▶ a series of reactions in which a glucose molecule is broken into two pyruvate molecules and energy is released
- ▶ a reaction in which pyruvate is oxidized by NAD^+ and CO_2 is removed, forming an acetyl group and releasing NADP (two words)
- ▶ a cyclic series of reactions that transfers energy from organic molecules to ATP, NADH, and FADH_2 and releases carbon atoms as CO_2 (three words)
- ▶ a process that uses a final inorganic oxidizing agent, other than oxygen, to produce energy (two words)
- ▶ a process that uses an organic compound as the final oxidizing agent to produce energy
- ▶ an organism that cannot survive in the presence of oxygen (two words)
- ▶ an organism that can live with or without oxygen (two words)
- ▶ a chemical reaction that removes a carboxyl group to form CO_2 (two words)
- ▶ the removal of a hydrogen atom from a molecule
- ▶ a difference in proton (H^+ ion) concentration across a membrane (two words)
- ▶ a force that moves protons because of a chemical gradient (often referred to as an electrochemical gradient) of protons across a membrane (two words)
- ▶ a process in which ATP is synthesized using the energy of an electrochemical gradient and the ATP synthase enzyme
- ▶ the amount of energy that is expended per unit time in an organism (two words)
- ▶ the metabolic rate of an organism at rest (three words)
- ▶ a process in which fatty acids are broken down into acetyl-CoA through catabolism
- ▶ a process in which pyruvate is decarboxylated, producing a molecule of CO_2 , ethanol, and an NAD^+ (two words)
- ▶ a process in which pyruvate reacts with NADH and is converted directly into lactate and regenerates NAD^+ (two words)

P	Y	R	U	V	A	T	E	O	X	I	D	A	T	I	O	N	R	R	L	C	M	Z	V	N	J	P
K	W	O	V	H	Y	P	R	O	T	O	N	G	R	A	D	I	E	N	T	O	E	A	O	N	S	B
Y	K	Y	L	E	R	E	Q	L	X	D	E	H	Y	D	R	O	G	E	N	A	T	I	O	N	W	O
Z	B	G	Y	L	M	N	H	Z	N	U	I	T	S	C	U	Z	R	T	X	F	T	Q	N	C	B	I
B	I	P	V	D	M	O	G	K	O	V	U	H	H	K	Y	Q	P	C	N	A	F	A	M	L	K	E
X	P	N	Y	G	G	I	E	E	I	K	A	C	K	H	D	X	N	L	T	K	Q	N	I	B	Q	L
P	K	F	H	L	R	T	A	Z	T	N	K	O	I	O	L	R	D	N	R	R	M	G	I	N	A	C
D	K	O	A	Y	Q	A	V	S	A	S	S	U	I	A	F	C	E	E	Z	F	A	Z	A	E	E	Y
E	U	C	R	C	J	T	N	L	L	Y	J	O	Q	X	X	M	Q	O	W	T	E	X	M	Y	R	C
C	L	Y	C	O	Z	N	P	O	Y	Q	T	N	T	D	R	Z	P	E	E	R	M	E	U	S	O	D
A	Y	D	W	L	F	E	K	J	R	E	I	C	K	E	H	D	U	A	B	A	E	V	K	I	B	I
R	U	D	U	Y	P	M	R	H	O	D	S	B	F	P	R	I	N	O	E	D	T	B	U	S	I	C
B	O	N	L	S	L	R	U	V	H	J	H	L	O	J	Y	A	Z	M	K	J	V	C	R	O	C	A
O	P	M	H	I	R	E	Q	Y	P	D	O	B	N	G	E	A	B	S	W	E	O	I	P	M	C	C
X	Q	H	P	S	D	F	Q	E	S	H	J	V	D	R	V	N	N	U	N	Y	P	Y	Q	S	E	I
Y	N	O	I	T	A	L	Y	R	O	H	P	S	O	H	P	E	V	I	T	A	D	I	X	O	L	R
L	C	O	G	P	N	L	F	C	H	O	E	B	K	P	G	N	Z	M	H	V	W	E	P	I	L	T
A	B	J	I	Q	G	I	L	K	P	W	E	V	M	V	V	S	L	P	O	E	Y	J	N	M	U	I
T	E	A	F	M	O	A	J	J	L	W	F	G	Z	C	S	O	V	B	E	B	T	X	Z	E	L	C
I	T	B	A	B	H	U	I	K	E	E	Y	Z	B	F	K	R	O	Y	I	J	E	R	T	H	A	R
O	A	Y	S	J	M	Z	M	H	V	Q	M	X	G	D	E	S	S	I	N	T	C	Z	T	C	R	Z
N	O	N	H	C	Y	F	I	X	E	E	R	U	H	J	B	C	K	E	Z	I	I	T	Q	E	R	D
R	X	Y	U	S	B	A	S	A	L	M	E	T	A	B	O	L	I	C	R	A	T	E	V	L	E	M
E	I	Y	W	H	U	E	A	N	E	Y	Q	S	R	L	Z	Y	W	U	J	F	O	R	V	C	S	Y
A	D	J	E	Z	C	Y	J	L	T	O	B	L	I	G	A	T	E	A	E	R	O	B	E	N	P	G
C	A	J	N	J	N	O	I	T	A	R	I	P	S	E	R	C	I	B	O	R	E	A	N	A	I	I
T	T	F	K	Q	Q	V	Q	E	R	E	C	R	O	F	E	V	I	T	O	M	N	O	T	O	R	P
I	I	D	M	O	L	O	D	J	T	M	L	Q	D	C	X	W	M	D	W	U	V	C	W	K	A	G
O	O	Z	I	T	S	P	E	P	S	C	E	H	X	R	O	K	J	N	H	Z	Z	N	I	M	T	S
N	N	V	G	F	S	S	H	S	B	J	N	D	E	N	A	R	R	U	S	C	E	Q	K	R	I	H
Y	K	X	B	C	P	U	W	U	U	I	M	E	T	A	B	O	L	I	C	R	A	T	E	P	O	Z
R	O	C	B	X	R	V	J	W	S	L	N	A	M	Y	F	U	S	K	P	M	T	T	B	B	N	U
N	O	I	T	A	T	N	E	M	R	E	F	E	T	A	T	C	A	L	K	E	W	P	G	L	K	A
W	I	J	W	B	G	N	F	A	C	U	L	T	A	T	I	V	E	A	N	A	E	R	O	B	E	P



Chapter 5

Photosynthesis: The Energy of Life

- ▶ an organism that makes its own food using energy from the Sun
- ▶ the first stage of photosynthesis, during which water molecules are split as light energy is absorbed and transformed into chemical energy in ATP and NADPH (two words)
- ▶ the second stage of the photosynthesis process that uses ATP and NADPH to convert CO₂ to sugars (two words)
- ▶ a molecule capable of accepting electrons and becoming reduced during photosynthesis (three words)
- ▶ a cluster of light-absorbing pigments embedded in the thylakoid membrane able to capture and transfer energy to special chlorophyll *a* molecules in the reaction centre (two words)
- ▶ a complex of proteins and pigments that contain the primary electron acceptor (two words)
- ▶ a plot of the amount of light energy of various wavelengths that a substance absorbs (two words)
- ▶ a plot of the effectiveness of light energy of different wavelengths in driving a chemical process (two words)
- ▶ a collection of pigment proteins that includes chlorophyll *a* and absorbs light at the 700 nm wavelength (two words)
- ▶ a collection of pigment proteins that includes chlorophyll *a* and absorbs light at the 680 nm wavelength (two words)
- ▶ ribulose 1,5-bisphosphate carboxylase oxygenase; a critical enzyme that acts as a catalyst for the reduction of carbon dioxide in the Calvin cycle of photosynthesis
- ▶ small pores in the surface of a leaf that can be opened and closed to control the exchange of gases between the atmosphere and the leaf interior
- ▶ the catalysis of O₂ instead of CO₂ by rubisco into RuBP, which slows the Calvin cycle, consumes ATP, and results in a release of carbon
- ▶ an alternate form of carbon fixation that some plants use, particularly in hot weather, to increase the concentration of CO₂ available for the Calvin cycle reactions (two words)
- ▶ a metabolic pathway, used mostly by succulent plants, in which the Calvin cycle and the C₄ cycle are separated in time for better efficiency of CO₂ fixation (three words)

J	T	O	U	O	M	W	Q	Z	Q	Z	R	M	M	K	V	X	I	C	V	T	G	H	G	P	R	T
X	U	W	E	R	T	N	E	C	N	O	I	T	C	A	E	R	G	S	R	G	K	N	R	S	S	H
B	Y	S	N	Q	K	Q	V	O	R	J	H	P	Z	O	J	S	B	S	C	B	B	I	F	W	L	V
P	S	K	H	P	T	N	M	G	H	H	X	A	O	I	E	C	K	R	I	X	M	H	Q	Q	I	J
A	M	N	S	J	M	N	T	Y	J	X	O	K	T	D	B	D	G	I	F	A	E	P	Z	A	G	N
C	L	Z	Q	Y	W	U	I	D	B	S	Y	E	P	J	J	S	K	E	R	M	D	O	P	I	H	I
P	F	K	I	Y	B	G	J	G	D	Y	W	C	G	E	M	Q	H	Y	A	U	P	R	H	J	T	O
M	J	U	F	N	V	B	S	I	O	X	J	O	L	V	K	T	E	P	E	R	W	T	O	V	D	W
P	S	G	R	H	Y	A	Y	O	C	O	M	C	K	C	W	L	N	O	L	T	G	O	T	Q	E	N
Q	Z	I	B	H	Z	H	J	E	N	T	Y	E	W	I	E	L	A	V	U	C	L	T	O	A	P	P
I	U	Q	L	S	T	A	B	G	Q	C	T	D	E	C	J	U	W	Z	V	E	T	U	S	Q	E	F
I	N	P	S	O	F	L	Y	V	N	M	X	E	T	U	T	N	C	C	L	P	F	A	Y	B	N	L
Q	D	L	Z	V	B	I	H	I	Z	R	J	R	Q	B	Q	Z	D	P	X	S	M	O	S	C	D	K
L	K	T	U	S	K	A	V	G	Q	C	O	D	V	M	T	B	E	Q	S	N	A	T	T	P	E	R
N	Y	U	A	F	S	L	T	U	Q	N	J	M	S	T	R	B	E	O	H	O	P	O	E	V	N	F
O	J	Z	Y	O	A	X	K	E	A	Z	V	R	H	F	V	A	D	D	K	I	T	H	M	W	T	L
J	M	K	Z	C	Z	O	O	C	M	B	T	P	I	B	I	P	Q	P	Y	T	S	P	I	V	R	A
H	Y	F	G	P	E	S	C	X	T	D	M	S	W	M	M	W	C	F	S	P	H	O	I	F	E	C
F	M	V	X	H	N	E	V	Q	P	A	I	Z	I	E	E	O	Y	X	B	R	W	S	H	U	A	T
R	Z	R	F	O	P	G	O	V	C	N	U	C	P	I	K	T	C	I	C	O	G	D	D	C	C	I
B	N	K	P	T	C	E	A	H	D	T	N	S	A	M	H	X	S	N	F	S	M	X	U	J	T	O
X	T	O	O	O	B	G	I	G	E	E	H	C	R	N	V	N	F	Y	O	B	R	E	L	J	I	N
R	T	R	I	R	N	A	Q	M	J	N	K	V	4	F	A	K	I	G	S	A	N	W	R	M	O	S
I	J	U	K	E	D	I	N	R	C	N	K	J	Y	C	N	E	O	W	N	O	H	N	H	I	N	P
G	T	P	N	S	B	R	J	Z	P	A	W	O	Y	J	Y	R	C	P	I	S	T	O	R	U	S	E
Z	E	Y	H	P	J	V	Q	V	D	C	G	J	C	U	H	C	V	A	A	Y	U	O	M	H	N	C
M	V	P	B	I	S	N	X	U	G	O	B	A	L	V	R	S	L	V	L	T	J	O	H	A	W	T
B	I	H	A	R	J	Y	V	G	F	M	D	Y	T	Z	I	D	Z	E	V	U	A	F	M	P	R	R
O	R	X	P	A	Z	Z	X	M	O	P	I	X	T	W	Z	X	U	J	E	L	S	M	N	U	S	U
X	J	J	M	T	R	P	I	U	S	L	O	I	Y	E	H	C	V	I	C	L	H	S	O	Q	U	M
M	A	G	D	I	R	J	Y	G	P	E	T	S	P	M	A	J	N	T	I	J	C	J	A	T	O	N
A	V	T	B	O	R	T	N	S	Q	X	A	N	A	J	H	C	W	M	U	U	D	N	E	R	S	G
Q	O	V	P	N	P	H	U	S	T	S	V	C	V	L	P	T	X	L	I	J	S	B	X	U	C	D
W	C	C	E	T	B	D	R	U	B	I	S	C	O	W	F	R	B	D	F	Z	I	T	C	M	E	R



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Unit 2 Metabolic Processes

- ▶ the sum of all chemical reactions in a cell or organism
- ▶ the energy of motion (two words)
- ▶ the stored energy that an object possesses as a result of its position relative to other objects or to its internal structure (two words)
- ▶ principle that states that energy can be transferred or transformed, but it cannot be created or destroyed (four words)
- ▶ the minimum amount of energy that is required to break a particular type of bond; measured in kJ/mol of bonds (two words)
- ▶ the number of atoms or molecules whose mass in grams is equal to the atomic mass of one such particle in atomic mass units; one carbon atom has a mass of 12 AU, and therefore one mole of carbon atoms has a mass of 12 g
- ▶ the minimum amount of energy that chemical reactants must absorb to start a reaction (two words)
- ▶ a temporary condition during a chemical reaction in which the bonds in the reactants are breaking and the bonds in the products are forming (two words)
- ▶ a chemical reaction in which energy is released, leaving the products with less chemical potential energy than the reactants (two words)
- ▶ a chemical reaction in which energy is absorbed, giving the products more chemical potential energy than the reactants (two words)
- ▶ principle that states that every time energy is converted to another form, some of the energy becomes unusable (four words)
- ▶ a measurement of disorder in a system
- ▶ a change that will, once begun, continue on its own under a given set of conditions; does not require a continuous supply of energy (two words)
- ▶ energy that can do useful work (two words)
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- ▶ the reduced form of the coenzyme nicotinamide adenine dinucleotide
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- ▶ a cyclic series of reactions that transfers energy from organic molecules to ATP, NADH, and FADH₂ and releases carbon atoms as CO_2 (three words)
- ▶ a process that uses a final inorganic oxidizing agent, other than oxygen, to produce energy (two words)
- ▶ a process that uses an organic compound as the final oxidizing agent to produce energy
- ▶ an organism that cannot survive in the presence of oxygen (two words)
- ▶ an organism that can live with or without oxygen (two words)
- ▶ a chemical reaction that removes a carboxyl group to form CO_2 (two words)
- ▶ the removal of a hydrogen atom from a molecule
- ▶ a difference in proton (H^+ ion) concentration across a membrane (two words)
- ▶ a force that moves protons because of a chemical gradient (often referred to as an electrochemical gradient) of protons across a membrane (two words)
- ▶ a process in which ATP is synthesized using the energy of an electrochemical gradient and the ATP synthase enzyme
- ▶ the amount of energy that is expended per unit time in an organism (two words)
- ▶ the metabolic rate of an organism at rest (three words)
- ▶ a process in which fatty acids are broken down into acetyl-CoA through catabolism
- ▶ a process in which pyruvate is decarboxylated, producing a molecule of CO_2 , ethanol, and an NAD^+ (two words)
- ▶ a process in which pyruvate reacts with NADH and is converted directly into lactate and regenerates NAD^+ (two words)
- ▶ an organism that makes its own food using energy from the Sun
- ▶ the first stage of photosynthesis, during which water molecules are split as light energy is absorbed and transformed into chemical energy in ATP and NADPH (two words)
- ▶ the second stage of the photosynthesis process that uses ATP and NADPH to convert CO_2 to sugars (two words)
- ▶ a molecule capable of accepting electrons and becoming reduced during photosynthesis (three words)
- ▶ a cluster of light-absorbing pigments embedded in the thylakoid membrane able to capture and transfer energy to special chlorophyll a molecules in the reaction centre (two words)
- ▶ a complex of proteins and pigments that contain the primary electron acceptor (two words)
- ▶ a plot of the amount of light energy of various wavelengths that a substance absorbs (two words)
- ▶ a plot of the effectiveness of light energy of different wavelengths in driving a chemical process (two words)
- ▶ a collection of pigment proteins that includes chlorophyll a and absorbs light at the 700 nm wavelength (two words)
- ▶ a collection of pigment proteins that includes chlorophyll a and absorbs light at the 680 nm wavelength (two words)
- ▶ ribulose 1,5-bisphosphate carboxylase oxygenase; a critical enzyme that acts as a catalyst for the reduction of carbon dioxide in the Calvin cycle of photosynthesis
- ▶ small pores in the surface of a leaf that can be opened and closed to control the exchange of gases between the atmosphere and the leaf interior
- ▶ the catalysis of O_2 instead of CO_2 by rubisco into RuBP, which slows the Calvin cycle, consumes ATP, and results in a release of carbon
- ▶ an alternate form of carbon fixation that some plants use, particularly in hot weather, to increase the concentration of CO_2 available for the Calvin cycle reactions (two words)
- ▶ a metabolic pathway, used mostly by succulent plants, in which the Calvin cycle and the C_4 cycle are separated in time for better efficiency of CO_2 fixation (three words)

X N H S F O I B W A L C O H O L F E R M E N T A T I O N J P X O I J D C Q O P T
F I U M K I Y C B G L Y C O L Y S I S J B N O I T A R I P S E R O T O H P V R O
A A P H O T O A U T O T R O P H I F X L V L R I I I D C M Y W D R P N X F O O V
X D F R E E E N E R G Y C S P O N T A N E O U S C H A N G E I A F V Q D F M T V
O O B L I G A T E A E R O B E N S C Q G J H O S O J X U E W I H V L N G R Y O Q
N R X C R J A R D S C I M A N Y D O M R E H T F O W A L T S R I F H K S H Z N T
J W O L A G N M H B A S A L M E T A B O L I C R A T E B H O P B D Y U L H R G N
A J M Y L E Q T J C U H I Y N G K W L G R W J H M Y D O V I E A F B X A B I R O
Y G R E N E L A I T N E T O P S I S O M S O I M E H C H K T N G S S C H A S A I
V J N S F E X R S P H O T O S Y S T E M I I E X L I R O H R N T P V D S F R D T
Y M K O B P J B A Z C N L E I Y N R S P S M R O I V C Y D V R X D K U N U E I A
R F L E I C Y I T E B O R E A N A E V I T A T L U C A F P A V B E D W W O L E R
F F H F K T R A N O I T A R I P S E R C I B O R E A N A T T B L C X E H I C N I
E Y E F Z A C W A D F M B L R E A C T I O N C E N T R E D O C E Z E A X F Y T P
O Z U R D E O A N G E P S R Q N U E L L A L G P V W L K E Y C E X E B D J C C S
J W D R M P C Y E T B J R M R E B A R W H S Q Z Y E J T C P I P Q J S B N N F E
W C H F N E O A A R Q O G O L J B O G N U J Y A V X A 4 D V G E Q G L F O I R R
C Z R U K O N B G A C P X N T I D V H Y T M C E K T C L A K D R E Q E I Y V U R
N H P A E O O T R T W I H K P O U E R F Z G L F S Z A W X H F L X O T M A L B A
P V B H S L Q A A D C H N O T F N I C D W P N N V C C Z K B E H U A R N W A I L
A P Z K I S M X W T H U H O A R V M P T H Z O I T R C U S S G N L D J L H C S U
C N P S L H U G A Y I W O T G X J D O O A I P A L D W Z W P A Y K F Q C T R C L
Z D M H U Q V L A O S O K P P R C J S T T R T W Y P G O A Z R L J I B R A D O L
B E R L T N Q W A S R E N I L Q E P Z I I E U Q A A U E P O Q X H S E C P C A E
V C G U N S F Q J C N X K A Y A H D S I F V A I C C X O H G M Z E F Z U C E Z C
O A F W K T G B E V E V H G T O H N N E U H E T V A T P C F C X K F E H I V Z C
J R S H I F E G A X G A G L R M A E R E Q G I F V W S I H Y O U O F E M L Z O I
Q B N G R Q W T U G E U N Y V R U M P U C O P B O O T B V T G J N L Q A O N R B
R O O U I Z C Y M H Y R L A T D E R W X N I N W H R Z D H A Z R C S K E B P O O
V X I G U F G Y A A N A G D C N C L T S G O U P N Z C E T T T Y E L G R A J U R
Q Y T Z A W O O W W T O B O T I X C P C I G E Q Y O R E A D C I E N D O N S Y E
I L C W Z Q U X T I H W I A N T D E Z T E V P T E M I S R D Q N O V E I A X Y A
K A A D E S E I O D M T T T W I C M A P I P R O I X O T I B T N V N T L W J G A
I T E N S D N N D F H I A W A T C L E T W P S C D I E C A R I C M P E H K P D Y
N I R O A H D M V A O E Z P R D Y R A T Y B R N S D A H O D Q Z Y U W N H P G V
E O T I N Z O C E N R V I U C R I D E N A E M Y O C O P J Y I P C G I W E R I R
T N N T E B T I A T W V M R O I I X P A A B Q M I I Y Y G K A X S C D O E R F B
I R E A G A H H E H A G N H K X L V O C C C O R V Q T Y I Q F P O D H N B K G L
C E D N O C E W A L A B P B O R C O T E O T T L W U Z P O N W K A A E N P J F Y
E A N E R X R R F Y C S O N O S A I B S T I I O I F I G R S Y E D D T Z V N Z Y
N C E G D U M P J J O Y Y L V X O W U A C A D O B S U A A O Q W N S R E R J Q D
E T P O Y Q I U S H H V C C I N Z K R Z T E V G N Y M W S N S O D X Z L B W N L
R I E R H X C A P P T T Z P M C G F Q Z E A G U I Z S W E Z B B R U J O J F W U
G O D D E A R I Z T G B H K T F R K O X Y A C D R P T C O C U S A Q S R D E H B
Y N T Y D C E J N K U P J M Z A S A J S S U F R L Y O J A C J T J P G A C D E F
V H H H O C A P R I M A R Y E L E C T R O N A C C E P T O R L S C Q X C X I B V
B C G E P O C C A V H O W Y A I H U T E S J D E E B O R E A N A E T A G I L B O
V I I D C X T G L B G F J M I B M O L E H L F F Q X J T H A T A M O T S M U X A
Y V L B B T I A Z T N W I Q K K P E F I M Y X E L P M O C A N N E T N A Z M V V
L A R P P Y O W S E C O N D L A W O F T H E R M O D Y N A M I C S N P G A Z E B
I Q X K D G N T I K B H I M E T S Y S O T O H P L Y M J E F B N T Z J H N E Y C



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Chapter 6

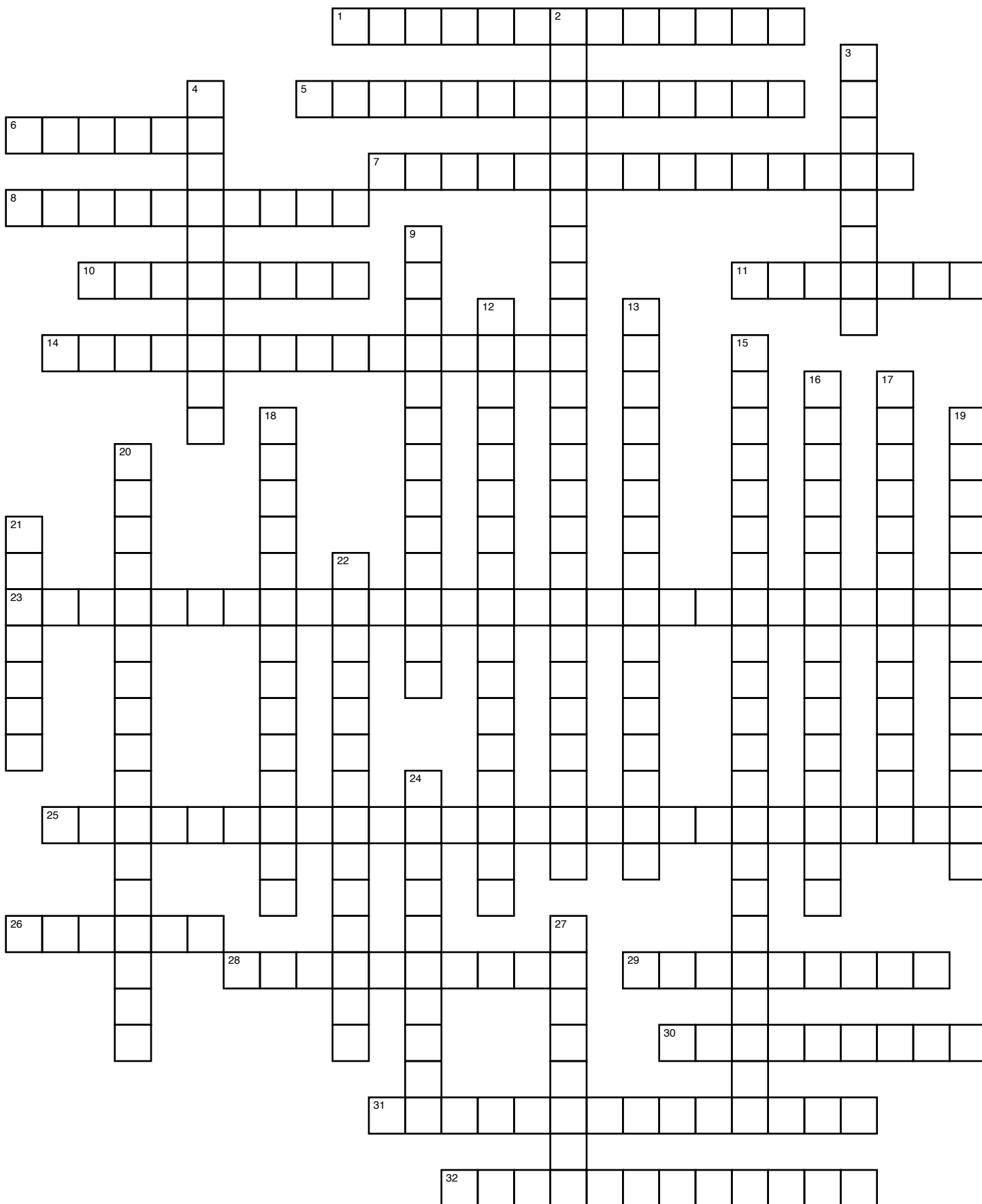
DNA: Hereditary Molecules of Life

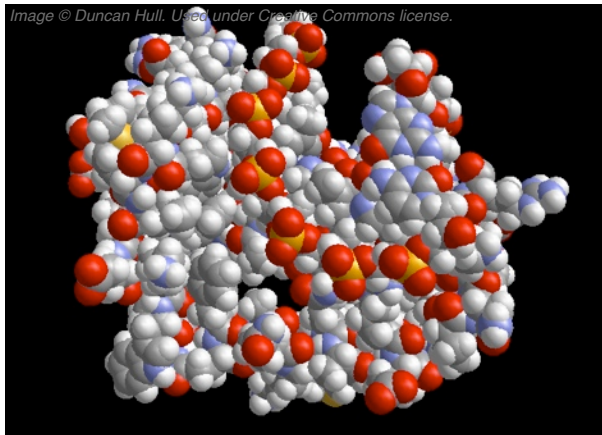
Across

1. the total number of times that an ordinary cell can divide (two words)
5. a prokaryotic replication enzyme that fills in gaps in the lagging strand between Okazaki fragments; also proofreads the final strands (three words)
6. the complete set of an organism's hereditary information
7. a prokaryotic replication enzyme that repairs damage to DNA, including damage that occurs between replication events (three words)
8. a unit of DNA storage, consisting of eight histones with DNA strands wrapped around them; the DNA around it is about 147 nucleotides in length
10. a group of six nucleosomes
11. a small circular section of DNA found in the cytosol of bacteria; replicates independently of the chromosomal DNA
14. the piece of new DNA on the lagging strand (two words)
23. a mechanism of DNA replication in which each of the two strands of parent DNA is incorporated into a new strand of DNA (two words)
25. a replication enzyme that prevents parent DNA strands from annealing to each other once they have been separated by helicase (three words)
26. a class of nitrogenous bases with a double ring structure; adenine and guanine are in this class
28. a class of nitrogenous bases with a single ring structure; thymine and cytosine are in this class
29. a replication molecule that acts as a starting point for replication (two words)
30. an enzyme that catalyzes the formation of a phosphodiester bond between two DNA strands, as well as between Okazaki fragments (two words)
31. the period in a cell's lifespan when it loses the ability to divide and grow; often referred to as cell aging (two words)
32. the continuous twisting of prokaryotic DNA, which reduces the volume of the DNA
12. the separating of DNA in both directions during replication (two words)
13. a prokaryotic replication enzyme that builds new DNA strands from nucleotides (three words)
15. a building block and energy source for replicating DNA (two words)
16. the point of separation of the two parent DNA strands during replication (two words)
17. a virus that targets bacteria
18. a class of enzymes that relieve tension caused by the unwinding of parent DNA; cleave one or two of the DNA strands, allow the strand(s) to untwist, and then rejoin the strand(s)
19. the DNA strand that is copied in the direction toward the replication fork (two words)
20. a specific sequence of DNA that acts as a starting point for replication (two words)
21. a special protein molecule that is the core around which the DNA strand wraps
22. a change in a genotype or phenotype caused by the direct uptake of genetic material by a cell
24. a replication enzyme that produces RNA primers (two words)
27. a repeating sequence of DNA at the end of a chromosome that protects coding regions from being lost during replication

Down

2. the chemical tendency of adenine to form hydrogen bonds with thymine, and cytosine to form hydrogen bonds with guanine (three words)
3. a replication enzyme that separates and unwinds the DNA strands
4. an enzyme that adds new telomere sequences to the ends of chromosomes
9. the DNA strand that is copied in the direction away from the replication fork (two words)





Chapter 7

Genes and Protein Synthesis

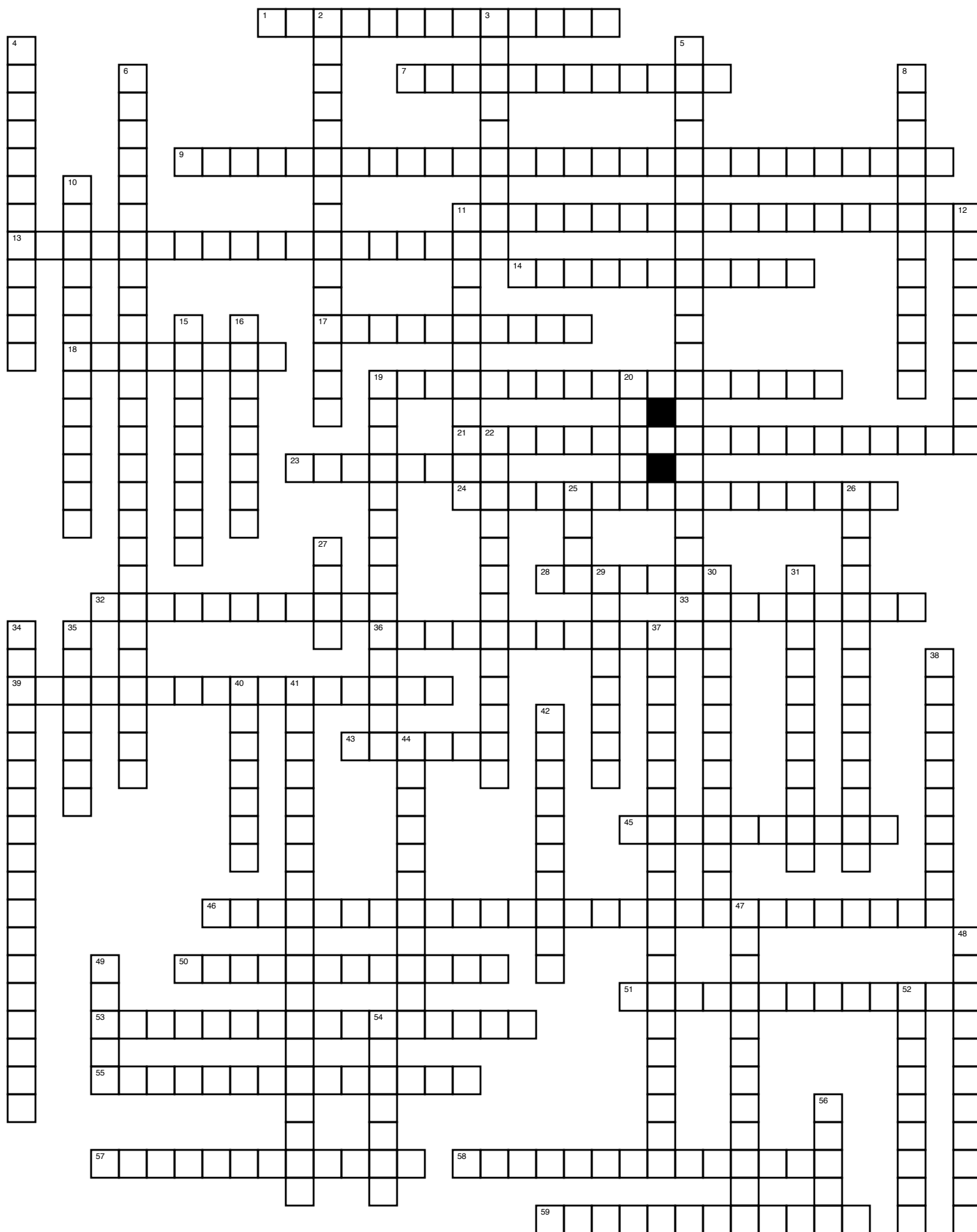
Across

1. a change in a single nucleotide within a gene (two words)
7. the fundamental principle of molecular genetics, which states that genetic information flows from DNA to RNA to proteins (two words)
9. a difference in the DNA between individuals caused by point mutations (three words)
11. the study of the organization, functions, and relationships of the genomes of different species (two words)
13. a shift in the reading frame resulting in multiple missense and/or nonsense effects (two words)
14. an enzyme-protein complex that removes introns from the mRNA
17. a small segment of DNA that can move to a different position in the genome
18. the region in the operon that regulatory factors bind to
19. a process that produces different mRNAs from pre-mRNA (exons and introns), allowing more than one possible polypeptide to be made from a single gene (two words)
21. a mutation that is caused by an error in DNA replication (two words)
23. a nucleotide sequence that lies just before a gene and allows for the binding of RNA polymerase
24. a protein that binds to the operator to repress gene transcription (two words)
28. a signal molecule that triggers the expression of an operon's genes
32. a chain of adenine nucleotides that are added to the 3' end of the pre-mRNA molecule to protect it from enzymes in the cytosol (two words)
33. the addition of a base pair (small-scale mutation) or larger coding region (large-scale mutation) to a DNA sequence
36. a molecule of transfer RNA bound to its associated amino acid
39. a mutation that changes a single amino acid in the coding sequence (two words)
43. a non-coding sequence of DNA or RNA
45. the codon that signals the start of a polypeptide chain and initiates translation (two words)
46. non-coding, repeating sequences of DNA that vary in length between homologous chromosomes and between individuals (four words)
50. the DNA strand that is not copied but contains the same sequence as the new RNA molecule (two words)

51. mechanism by which the information coded in nucleic acids of DNA is copied into the nucleic acids of RNA; something rewritten in the same language
53. a mutation that results in a premature stop codon (two words)
55. a mutation that does not alter the resulting sequence of amino acids (two words)
57. the use of viral vectors to introduce new genetic material into a cell
58. the DNA strand that is copied into an mRNA molecule during gene transcription (two words)
59. an RNA molecule within the ribosome that bonds the correct amino acid to the polypeptide chain (two words)

Down

2. a mutation that is caused by the effect of an environmental agent (two words)
3. the complementary sequence of base pairs on a tRNA that corresponds with a codon on an mRNA
4. a particular system for separating a base pair sequence into readable codons (two words)
5. protein that binds to introns and signals them for removal (two words)
6. the hypothesis, proposed by Beadle and Tatum, that each gene is unique and codes for the synthesis of a single enzyme (four words)
8. the replacement of one base pair in a DNA sequence by another base pair
10. the movement of entire genes or sequences of DNA from one chromosome to another
11. a signal molecule that binds to a regulatory protein to reduce the expression of an operon's genes
12. the codon that signals the end of a polypeptide chain causes the ribosome to terminate translation (two words)
15. a cluster of genes that contains the DNA sequence to regulate the metabolism of lactose (two words)
16. a complex that is formed when multiple ribosomes attach to the same mRNA molecule in order to facilitate rapid translation
19. the process by which a tRNA molecule is bound to its corresponding amino acid
20. repetitive DNA sequences, approximately 500 bp in length on average, interspersed throughout the genome
22. the initial RNA transcription product (two words)
25. a sequence of DNA or RNA that codes for part of a gene
26. the codon that signals the start of a polypeptide chain and initiates translation (two words)
27. a sequence of seven Gs that is added to the start of a pre-mRNA molecule; ribosomes recognize this site and use it as the site of initial attachment (two words)
29. the removal of a base pair (small-scale mutation) or larger coding region (large-scale mutation) from a DNA sequence
30. an enzyme that reads a DNA strand and creates a complementary strand of RNA (two words)
31. mechanism by which the information coded in nucleic acids of RNA is copied into the amino acids proteins
34. the joint government and private sector research project that sequenced the human genome (three words)
35. a hormone produced in the pancreas that lowers the blood glucose level by promoting the uptake of glucose by the body cells
37. a viral enzyme that uses RNA as a template strand to synthesize complementary DNA (two words)
38. a virus that uses reverse transcriptase for replication
40. an environmental agent that directly alters the DNA within a cell
41. a sequence of bases at the end of a gene that signals the RNA polymerase to stop transcribing (two words)
42. a sequence of DNA that is similar to an existing gene but does not code for protein
44. a carrier molecule that binds to a specific amino acid and adds the amino acid to the growing polypeptide chain (two words)
47. the end product of the transcription of a gene; mRNA is translated by ribosomes into a protein (two words)
48. the specific coding relationship between bases and the amino acids they specify; can be expressed in terms of either DNA or RNA bases (two words)
49. repetitive DNA sequences, approximately 6500 bp in length on average, interspersed throughout the genome
52. two adjacent bases trading places (small-scale mutation) or the reversal of a sequence of DNA (large-scale mutation)
54. a region of the promotor that enables the binding of RNA polymerase (two words)
56. a group of three base pairs that code for an individual amino acid





Chapter 8

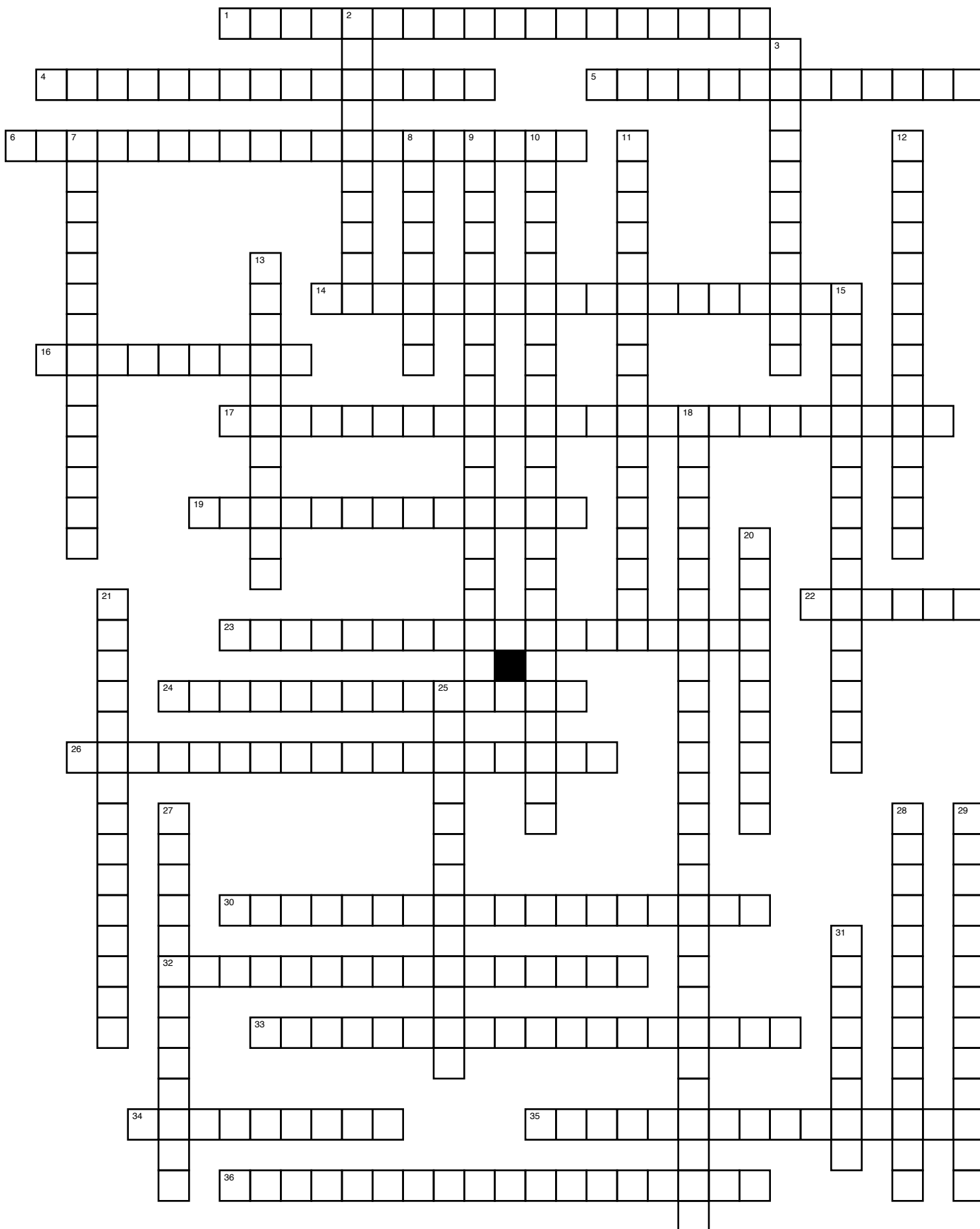
Genetic Technologies

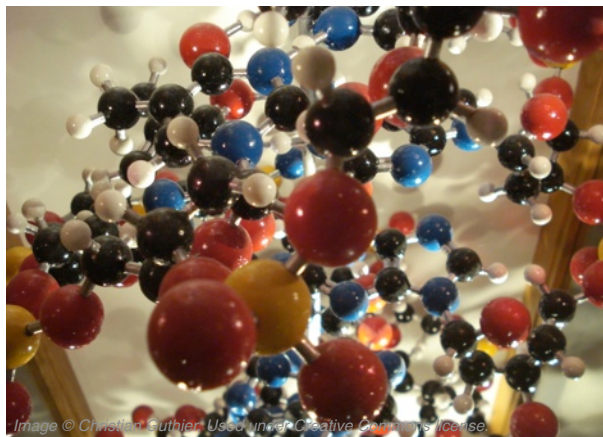
Across

1. the study of the structure of genes and their locations in a genome, as well as the analysis of the nucleotide sequences to locate genes within the genome (two words)
4. a large molecule that resembles a base pair, which allows it to insert itself into DNA; used for staining electrophoresis gels (two words)
5. a type of diabetes caused by low insulin or an inability to use insulin (three words)
6. a process in which germ cells (sperm cells or eggs) are modified by integrating functional genes into their genomes (three words)
14. the intentional production of new genes and the alteration of genomes by the substitution or introduction of new genetic material (two words)
16. a short single-stranded DNA sequence, easily synthesized in a laboratory, that is complementary to a sequence at one end of the target sequence (two words)
17. a DNA sequencing method that involves blowing DNA strands into many fragments and then using computer technology to sequence and reassemble the fragments (three words)
19. a solid surface that has a microscopic grid of many DNA fragments, called probes, attached; used to determine gene expression (two words)
22. a DNA molecule that is used as a vehicle to transfer foreign genetic material into a cell; for example, a plasmid
23. a process in which therapeutic genes are transferred into somatic cells to treat a genetic disease (three words)
24. the use of computer technology to process a large amount of biological data
26. the study of the functions of genes, the proteins they make, and how these proteins function (two words)
30. an organism that has been modified to carry genes it does not normally carry (two words)
32. a disease in which the blood glucose level is too high because of insufficient production or activity of the hormone insulin (two words)
33. a fragment of DNA that is used to detect the presence of complementary nucleotide sequences (two words)
34. the end that remains after restriction enzymes cut on a zigzag across a DNA strand; it can form hydrogen bonds with a complementary sticky end on any other DNA molecule that has been cut by the same enzyme (two words)
35. a sequence of bases on a DNA strand that restriction enzymes bind to (two words)
36. a method for separating large molecules, such as DNA, RNA, and proteins (two words)

Down

2. an identical copy of an original target gene that can be made by introducing the target gene into a host cell and having it copied (two words)
3. a process in which genetically engineered host organisms are used to make pharmaceuticals or other products that are useful to humans
7. a DNA strand create using DNA pieces from two or more sources (two words)
8. a cell that has taken up a foreign plasmid or virus and has used its cellular machinery to express the foreign DNA (two words)
9. a fragment that is produced when a DNA strand is cut by a restriction enzyme (two words)
10. a process that is used to make a huge number of copies of a DNA sequence in a laboratory, quickly and without the need for a host organism (three words)
11. an enzyme that cuts DNA at a specific location in a base sequence; also called restriction endonuclease (two words)
12. a diagram that shows restriction enzyme recognition sites and the distances, measured in base pairs, between the sites (two words)
13. the insertion, removal, or replacement of genes (to correct defective genes) within an organism's cells to treat a disease (two words)
15. biochemical or molecular tests that are used to identify inherited disorders in parents, potential parents, embryos, or children after they are born (two words)
18. an organism that has been modified to carry genes it does not normally carry (three words)
20. the number of plasmids of a specific type within a cell (two words)
21. a fragment of a known size that is run as a comparison standard for gel electrophoresis (two words)
25. a genetic sampling method for testing *in utero*
27. a type of diabetes caused by an inability to produce insulin (three words)
28. a process in which the sequence of base pairs in a DNA strand is determined (two words)
29. a cell that is able to take up foreign DNA from its surroundings (two words)
31. the end that remains after restriction enzymes cut straight across a DNA strand; it is more difficult to recombine with another strand than a sticky end (two words)





Unit 3

Molecular Genetics

Across

2. the codon that signals the start of a polypeptide chain and initiates translation (two words)
5. a replication enzyme that produces RNA primers (two words)
9. the total number of times that an ordinary cell can divide (two words)
13. a complex that is formed when multiple ribosomes attach to the same mRNA molecule in order to facilitate rapid translation
16. a mutation that is caused by an error in DNA replication (two words)
18. a non-coding sequence of DNA or RNA
20. the study of the structure of genes and their locations in a genome, as well as the analysis of the nucleotide sequences to locate genes within the genome (two words)
25. a mutation that is caused by the effect of an environmental agent (two words)
28. the process by which a tRNA molecule is bound to its corresponding amino acid
30. a replication molecule that acts as a starting point for replication (two words)
33. a signal molecule that triggers the expression of an operon's genes
35. the intentional production of new genes and the alteration of genomes by the substitution or introduction of new genetic material (two words)
37. a building block and energy source for replicating DNA (two words)
38. the DNA strand that is copied in the direction toward the replication fork (two words)
39. the hypothesis that each gene is unique and codes for the synthesis of a single polypeptide; the restated version of the one gene-one enzyme hypothesis (four words)
42. the movement of entire genes or sequences of DNA from one chromosome to another
43. a process in which genetically engineered host organisms are used to make pharmaceuticals or other products that are useful to humans
46. a mutation that results in a premature stop codon (two words)
49. a difference in the DNA between individuals caused by point mutations (three words)
51. the hypothesis, proposed by Beadle and Tatum, that each gene is unique and codes for the synthesis of a single enzyme (four words)
52. repetitive DNA sequences, approximately 500 bp in length on average, interspersed throughout the genome
54. a molecule of transfer RNA bound to its associated amino acid
55. the fundamental principle of molecular genetics, which states that genetic information flows from DNA to RNA to proteins (two words)
57. non-coding, repeating sequences of DNA that vary in length between homologous chromosomes and between individuals (four words)
59. a viral enzyme that uses RNA as a template strand to synthesize complementary DNA (two words)
62. a prokaryotic replication enzyme that repairs damage to DNA, including damage that occurs between replication events (three words)
65. a fragment of a known size that is run as a comparison standard for gel electrophoresis (two words)
68. a large molecule that resembles a base pair, which allows it to insert itself into DNA; used for staining electrophoresis gels (two words)
70. a group of three base pairs that code for an individual amino acid
73. an enzyme that catalyzes the formation of a phosphodiester bond between two DNA strands, as well as between Okazaki fragments (two words)
74. a process in which therapeutic genes are transferred into somatic cells to treat a genetic disease (three words)
75. a hormone produced in the pancreas that lowers the blood glucose level by promoting the uptake of glucose by the body cells
76. a signal molecule that binds to a regulatory protein to reduce the expression of an operon's genes
80. a DNA sequencing method that involves blowing DNA strands into many fragments and then using computer technology to sequence and reassemble the fragments (three words)
87. the piece of new DNA on the lagging strand (two words)
89. the DNA strand that is not copied but contains the same sequence as the new RNA molecule (two words)
91. a carrier molecule that binds to a specific amino acid and adds the amino acid to the growing polypeptide chain (two words)
92. the period in a cell's lifespan when it loses the ability to divide and grow; often referred to as cell aging (two words)
94. a particular system for separating a base pair sequence into readable codons (two words)
96. a type of diabetes caused by an inability to produce insulin (three words)
98. repetitive DNA sequences, approximately 6500 bp in length on average, interspersed throughout the genome
100. a class of enzymes that relieve tension caused by the unwinding of parent DNA; cleave one or two of the DNA strands, allow the strand(s) to untwist, and then rejoin the strand(s)
101. a prokaryotic replication enzyme that fills in gaps in the lagging strand between Okazaki fragments; also proofreads the final strands (three words)
104. the joint government and private sector research project that sequenced the human genome (three words)
105. the chemical tendency of adenine to form hydrogen bonds with thymine, and cytosine to form hydrogen bonds with guanine (three words)
107. a mutation that changes a single amino acid in the coding sequence (two words)
108. a replication enzyme that separates and unwinds the DNA strands
110. a specific sequence of DNA that acts as a starting point for replication (two words)

111. the end that remains after restriction enzymes cut on a zigzag across a DNA strand; it can form hydrogen bonds with a complementary sticky end on any other DNA molecule that has been cut by the same enzyme (two words)
113. a fragment of DNA that is used to detect the presence of complementary nucleotide sequences (two words)
115. the complete set of an organism's hereditary information
117. the codon that signals the start of a polypeptide chain and initiates translation (two words)
119. mechanism by which the information coded in nucleic acids of RNA is copied into the amino acids proteins
121. a region of the promoter that enables the binding of RNA polymerase (two words)
123. the complementary sequence of base pairs on a tRNA that corresponds with a codon on an mRNA
125. the DNA strand that is copied in the direction away from the replication fork (two words)
127. the study of the organization, functions, and relationships of the genomes of different species (two words)
129. a cell that is able to take up foreign DNA from its surroundings (two words)
131. the replacement of one base pair in a DNA sequence by another base pair
133. a repeating sequence of DNA at the end of a chromosome that protects coding regions from being lost during replication
135. the end that remains after restriction enzymes cut straight across a DNA strand; it is more difficult to recombine with another strand than a sticky end (two words)
137. a process in which germ cells (sperm cells or eggs) are modified by integrating functional genes into their genomes (three words)
139. the DNA strand that is copied into an mRNA molecule during gene transcription (two words)
141. the point of separation of the two parent DNA strands during replication (two words)
143. a protein that binds to the operator to repress gene transcription (two words)
145. a sequence of DNA that is similar to an existing gene but does not code for protein
147. a virus that targets bacteria
149. a sequence of bases at the end of a gene that signals the RNA polymerase to stop transcribing (two words)
151. an organism that has been modified to carry genes it does not normally carry (two words)
153. a class of nitrogenous bases with a single ring structure; thymine and cytosine are in this class
155. the codon that reads the end of a polypeptide chain causes the ribosome to terminate translation (two words)
157. a genetic sampling method for testing *in utero*
159. a mechanism of DNA replication in which each of the two strands of parent DNA is incorporated into a new strand of DNA (two words)
161. a chain of adenine nucleotides that are added to the 3' end of the pre-mRNA molecule to protect it from enzymes in the cytosol (two words)
163. a small segment of DNA that can move to a different position in the genome
165. a diagram that shows restriction enzyme recognition sites and the distances, measured in base pairs, between the sites (two words)
167. protein that binds to introns and signals them for removal (two words)
169. a fragment that is produced when a DNA strand is cut by a restriction enzyme (two words)

Down

1. the removal of a base pair (small-scale mutation) or larger coding region (large-scale mutation) from a DNA sequence
3. an enzyme that reads a DNA strand and creates a complementary strand of RNA (two words)
4. a prokaryotic replication enzyme that builds new DNA strands from nucleotides (three words)
6. a small circular section of DNA found in the cytosol of bacteria; replicates independently of the chromosomal DNA
7. a sequence of DNA or RNA that codes for part of a gene
8. a change in a genotype or phenotype caused by the direct uptake of genetic material by a cell
10. the addition of a base pair (small-scale mutation) or larger coding region (large-scale mutation) to a DNA sequence
11. a process in which the sequence of base pairs in a DNA strand is determined (two words)
12. the study of the functions of genes, the proteins they make, and how these proteins function (two words)
13. a change in a single nucleotide within a gene (two words)
14. a group of six nucleosides
15. a nucleotide sequence that lies just before a gene and allows for the binding of RNA polymerase
17. a type of diabetes caused by low insulin or an inability to use insulin (three words)
19. a virus that uses reverse transcriptase for replication
21. a sequence of bases on a DNA strand that restriction enzymes bind to (two words)
22. the use of viral vectors to introduce new genetic material into a cell
23. the use of computer technology to process a large amount of biological data
24. an identical copy of an original target gene that can be made by introducing the target gene into a host cell and having it copied (two words)
26. an enzyme that adds new telomere sequences to the ends of chromosomes
27. the piece of new DNA on the lagging strand (two words)
29. the DNA strand that is not copied but contains the same sequence as the new RNA molecule (two words)
31. a carrier molecule that binds to a specific amino acid and adds the amino acid to the growing polypeptide chain (two words)
32. the period in a cell's lifespan when it loses the ability to divide and grow; often referred to as cell aging (two words)
34. a particular system for separating a base pair sequence into readable codons (two words)
36. a type of diabetes caused by an inability to produce insulin (three words)
38. repetitive DNA sequences, approximately 6500 bp in length on average, interspersed throughout the genome
40. a class of enzymes that relieve tension caused by the unwinding of parent DNA; cleave one or two of the DNA strands, allow the strand(s) to untwist, and then rejoin the strand(s)
41. a prokaryotic replication enzyme that fills in gaps in the lagging strand between Okazaki fragments; also proofreads the final strands (three words)
44. the joint government and private sector research project that sequenced the human genome (three words)
45. the chemical tendency of adenine to form hydrogen bonds with thymine, and cytosine to form hydrogen bonds with guanine (three words)
47. a mutation that changes a single amino acid in the coding sequence (two words)
48. a replication enzyme that separates and unwinds the DNA strands
50. a specific sequence of DNA that acts as a starting point for replication (two words)
53. the end that remains after restriction enzymes cut on a zigzag across a DNA strand; it can form hydrogen bonds with a complementary sticky end on any other DNA molecule that has been cut by the same enzyme (two words)
56. a fragment of DNA that is used to detect the presence of complementary nucleotide sequences (two words)
58. mechanism by which the information coded in nucleic acids of DNA is copied into the nucleic acids of RNA; something rewritten in the same language
60. a DNA molecule that is used as a vehicle to transfer foreign genetic material into a cell; for example, a plasmid
61. an RNA molecule within the ribosome that bonds the correct amino acid to the polypeptide chain (two words)
63. an enzyme that cuts DNA at a specific location in a base sequence; also called restriction endonuclease (two words)
64. a class of nitrogenous bases with a double ring structure; adenine and guanine are in this class
66. two adjacent bases trading places (small-scale mutation) or the reversal of a sequence of DNA (large-scale mutation)
67. a short single-stranded DNA sequence, easily synthesized in a laboratory, that is complementary to a sequence at one end of the target sequence (two words)
69. the end product of the transcription of a gene; mRNA is translated by ribosomes into a protein (two words)
71. a cluster of genes that contains the DNA sequence to regulate the metabolism of lactose (two words)
72. a sequence of seven Gs that is added to the start of a pre-mRNA molecule; ribosomes recognize this site and use it as the site of initial attachment (two words)
74. a replication enzyme that prevents parent DNA strands from annealing to each other once they have been separated by helicase (three words)
77. biochemical or molecular tests that are used to identify inherited disorders in parents, potential parents, embryos, or children after they are born (two words)
78. the separating of DNA in both directions during replication (two words)
79. a mutation that does not alter the resulting sequence of amino acids (two words)
81. an enzyme-protein complex that removes introns from the mRNA
82. an organism that has been modified to carry genes it does not normally carry (three words)
83. a special protein molecule that is the core around which the DNA strand wraps
84. a disease in which the blood glucose level is too high because of insufficient production or activity of the hormone insulin (two words)
87. the initial RNA transcription product (two words)
92. a method for separating large molecules, such as DNA, RNA, and proteins (two words)
94. the number of plasmids of a specific type within a cell (two words)
96. a process that is used to make a huge number of copies of a DNA sequence in a laboratory, quickly and without the need for a host organism (three words)
97. a shift in the reading frame resulting in multiple missense and/or nonsense effects (two words)
100. an environmental agent that directly alters the DNA within a cell
101. a unit of DNA storage, consisting of eight histones with DNA strands wrapped around them; the DNA around it is about 147 nucleotides in length
103. the insertion, removal, or replacement of genes (to correct defective genes) within an organism's cells to treat a disease (two words)
106. a process that produces different mRNAs from pre-mRNA (exons and introns), allowing more than one possible polypeptide to be made from a single gene (two words)
107. the region in the operon that regulatory factors bind to
108. the specific coding relationship between bases and the amino acids they specify; can be expressed in terms of either DNA or RNA bases (two words)
110. a DNA strand create using DNA pieces from two or more sources (two words)
112. a solid surface that has a microscopic grid of many DNA fragments, called probes, attached; used to determine gene expression (two words)

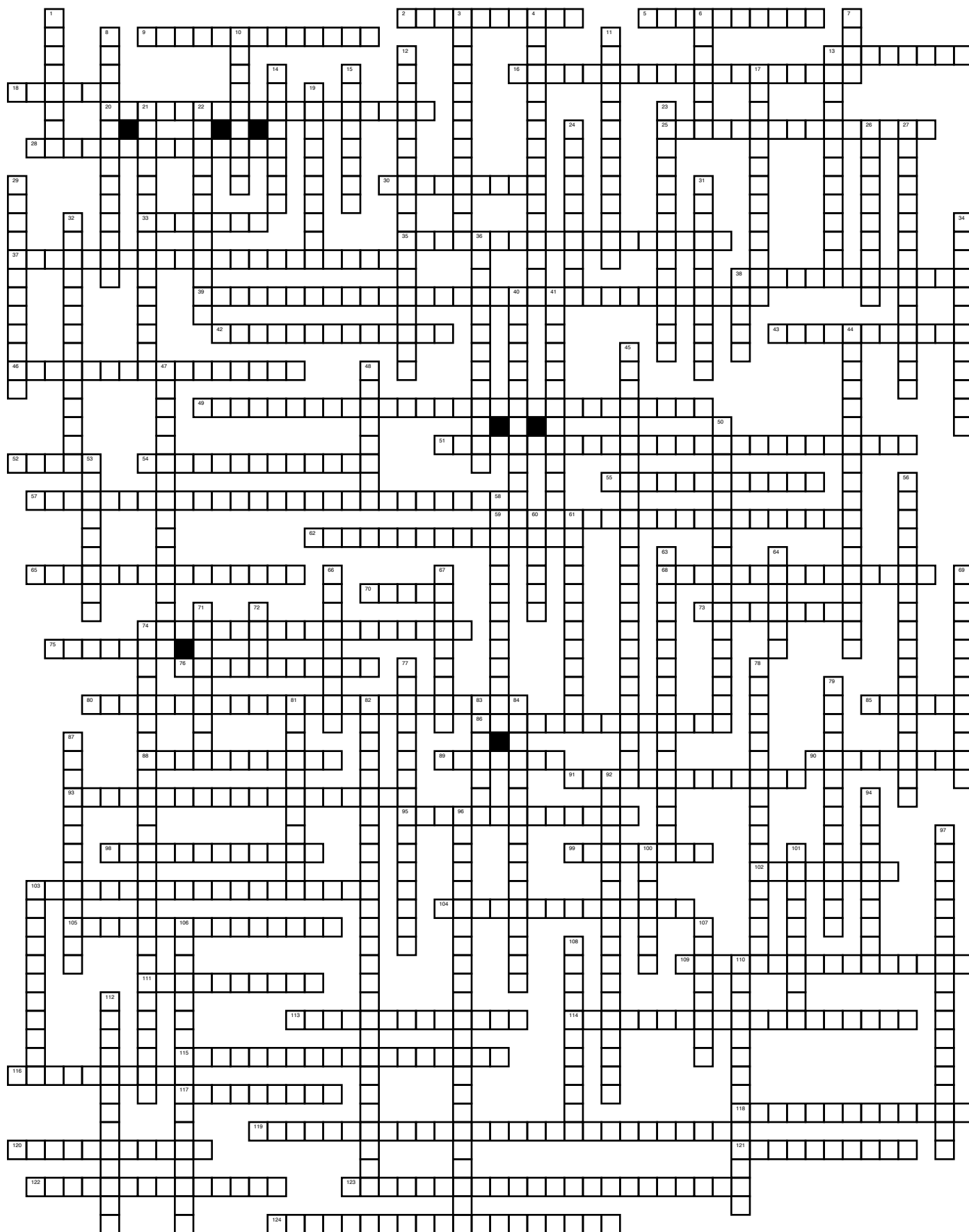




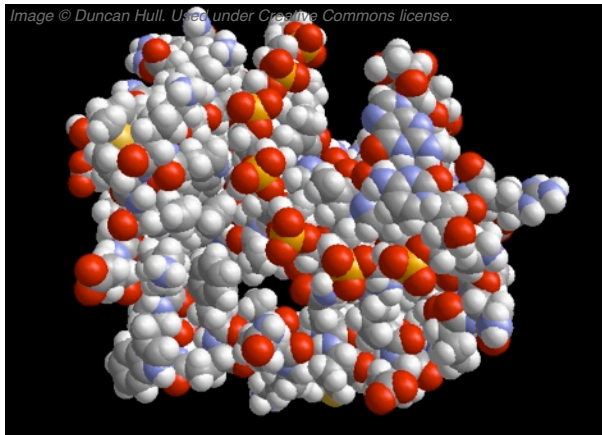
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Chapter 6

DNA: Hereditary Molecules of Life

- ▶ a special protein molecule that is the core around which the DNA strand wraps
- ▶ a small circular section of DNA found in the cytosol of bacteria; replicates independently of the chromosomal DNA
- ▶ the complete set of an organism's hereditary information
- ▶ a change in a genotype or phenotype caused by the direct uptake of genetic material by a cell
- ▶ a virus that targets bacteria
- ▶ a class of nitrogenous bases with a double ring structure; adenine and guanine are in this class
- ▶ a class of nitrogenous bases with a single ring structure; thymine and cytosine are in this class
- ▶ the chemical tendency of adenine to form hydrogen bonds with thymine, and cytosine to form hydrogen bonds with guanine (three words)
- ▶ a mechanism of DNA replication in which each of the two strands of parent DNA is incorporated into a new strand of DNA (two words)
- ▶ a specific sequence of DNA that acts as a starting point for replication (two words)
- ▶ a replication enzyme that separates and unwinds the DNA strands
- ▶ the point of separation of the two parent DNA strands during replication (two words)
- ▶ a class of enzymes that relieve tension caused by the unwinding of parent DNA; cleave one or two of the DNA strands, allow the strand(s) to untwist, and then rejoin the strand(s)
- ▶ a replication enzyme that prevents parent DNA strands from annealing to each other once they have been separated by helicase (three words)
- ▶ the separating of DNA in both directions during replication (two words)
- ▶ a building block and energy source for replicating DNA (two words)
- ▶ a replication enzyme that produces RNA primers (two words)
- ▶ a replication molecule that acts as a starting point for replication (two words)
- ▶ a prokaryotic replication enzyme that builds new DNA strands from nucleotides (three words)
- ▶ the DNA strand that is copied in the direction toward the replication fork (two words)
- ▶ the DNA strand that is copied in the direction away from the replication fork (two words)
- ▶ the piece of new DNA on the lagging strand (two words)
- ▶ a prokaryotic replication enzyme that fills in gaps in the lagging strand between Okazaki fragments; also proofreads the final strands (three words)
- ▶ an enzyme that catalyzes the formation of a phosphodiester bond between two DNA strands, as well as between Okazaki fragments (two words)
- ▶ a prokaryotic replication enzyme that repairs damage to DNA, including damage that occurs between replication events (three words)
- ▶ a unit of DNA storage, consisting of eight histones with DNA strands wrapped around them; the DNA around it is about 147 nucleotides in length
- ▶ a group of six nucleosomes
- ▶ the continuous twisting of prokaryotic DNA, which reduces the volume of the DNA
- ▶ a repeating sequence of DNA at the end of a chromosome that protects coding regions from being lost during replication
- ▶ the period in a cell's lifespan when it loses the ability to divide and grow; often referred to as cell aging (two words)
- ▶ the total number of times that an ordinary cell can divide (two words)
- ▶ an enzyme that adds new telomere sequences to the ends of chromosomes

D	P	H	Q	H	Q	F	P	W	H	R	N	A	P	R	I	M	A	S	E	J	N	L	D	J	U	S
A	O	W	E	F	K	Q	O	Q	C	K	D	N	A	P	O	L	Y	M	E	R	A	S	E	I	I	L
M	L	N	G	G	N	M	N	E	R	O	E	B	W	A	D	E	I	Z	S	B	C	C	T	N	G	E
A	L	B	B	N	W	U	Q	K	Q	A	M	S	S	S	S	A	S	H	M	L	H	Q	G	T	K	A
U	Q	K	C	D	I	P	C	C	Z	E	A	M	Y	A	K	G	A	J	C	K	Y	L	G	G	C	D
P	V	J	N	I	W	R	B	L	Z	U	E	A	G	Y	X	Z	O	G	G	E	E	N	U	W	O	I
X	X	E	O	O	D	Z	I	U	E	L	T	I	D	N	U	C	L	E	O	S	O	M	E	H	U	N
E	K	G	I	N	L	N	P	A	H	O	L	Y	O	E	J	R	D	Z	T	V	C	H	Z	Z	S	G
C	H	A	T	E	H	N	A	Q	P	A	S	X	Q	S	U	P	E	R	C	O	I	L	I	N	G	S
N	P	H	A	L	F	O	D	P	N	E	G	I	U	L	E	Z	A	C	K	Q	X	L	U	A	U	T
E	O	P	C	O	I	I	M	D	O	P	S	V	D	K	A	N	D	L	V	W	M	N	K	O	F	R
C	N	O	I	S	A	T	E	W	R	L	I	A	U	E	D	G	I	R	V	X	P	E	U	B	R	A
S	Z	I	L	F	Y	A	E	E	G	C	Y	G	B	B	T	K	G	D	N	C	V	R	W	H	X	N
E	K	R	P	K	L	M	Y	P	H	H	I	M	I	Y	Q	R	N	I	I	A	Z	A	I	W	B	D
N	T	E	E	B	D	R	R	L	H	H	Q	N	E	S	R	V	I	A	N	M	P	N	I	G	P	N
E	E	T	R	X	W	O	Y	K	Z	L	D	X	N	R	C	A	F	P	T	G	I	R	U	N	J	Y
S	L	C	E	H	S	F	N	G	J	I	O	R	O	U	A	G	T	M	H	Z	S	R	I	Q	W	U
L	O	A	V	X	T	S	Y	U	N	V	G	U	Y	U	W	S	J	N	U	O	J	T	Y	M	J	Y
L	M	B	I	R	Q	N	M	G	X	X	O	V	M	U	E	I	E	J	E	O	S	M	R	P	E	F
E	E	G	T	H	R	A	P	J	G	N	Q	M	Q	A	C	N	D	I	M	M	F	P	L	A	R	R
C	R	T	A	J	P	R	T	O	G	D	K	A	R	B	K	Q	O	S	I	D	E	A	H	T	N	V
W	E	O	V	N	O	T	C	E	S	A	R	E	M	O	L	E	T	T	O	I	S	L	G	A	I	D
X	P	H	R	T	O	J	U	N	H	J	K	F	V	E	T	M	T	X	S	M	I	Y	P	H	T	V
L	I	M	E	F	S	M	F	W	Z	O	J	R	Y	F	W	U	V	O	I	I	G	Q	F	M	B	E
X	W	I	S	X	K	F	G	M	C	C	V	H	Y	L	G	Y	A	D	X	T	H	Q	M	G	O	S
I	N	P	N	V	G	Q	B	G	M	O	K	A	Z	A	K	I	F	R	A	G	M	E	N	T	I	C
G	T	E	O	F	N	I	G	I	R	O	N	O	I	T	A	C	I	L	P	E	R	U	Z	H	F	X
E	L	I	C	Q	T	N	U	W	U	I	E	S	A	R	E	M	Y	L	O	P	A	N	D	J	A	G
N	K	U	I	P	E	N	I	R	U	P	L	W	K	J	N	N	N	Z	C	X	L	D	D	V	R	N
O	Y	C	M	I	D	H	E	L	I	C	A	S	E	Q	U	A	U	Z	U	D	G	R	Q	J	U	G
M	K	F	E	U	D	N	Q	C	O	R	E	P	L	I	C	A	T	I	O	N	B	U	B	B	L	E
E	Y	U	S	Q	Y	V	H	A	Y	F	L	I	C	K	L	I	M	I	T	B	Q	H	F	T	L	V
Z	N	L	B	B	J	S	E	S	A	R	E	M	O	S	I	O	P	O	T	N	E	P	F	O	P	Y
B	H	R	S	K	V	C	T	B	M	U	P	K	R	O	F	N	O	I	T	A	C	I	L	P	E	R



Chapter 7

Genes and Protein Synthesis

- ▶ the hypothesis, proposed by Beadle and Tatum, that each gene is unique and codes for the synthesis of a single enzyme (four words)
- ▶ the hypothesis that each gene is unique and codes for the synthesis of a single polypeptide; the restated version of the one gene-one enzyme hypothesis (four words)
- ▶ the fundamental principle of molecular genetics, which states that genetic information flows from DNA to RNA to proteins (two words)
- ▶ mechanism by which the information coded in nucleic acids of DNA is copied into the nucleic acids of RNA; something rewritten in the same language
- ▶ mechanism by which the information coded in nucleic acids of RNA is copied into the amino acids proteins
- ▶ the end product of the transcription of a gene; mRNA is translated by ribosomes into a protein (two words)
- ▶ a carrier molecule that binds to a specific amino acid and adds the amino acid to the growing polypeptide chain (two words)
- ▶ an RNA molecule within the ribosome that bonds the correct amino acid to the polypeptide chain (two words)
- ▶ an enzyme that reads a DNA strand and creates a complementary strand of RNA (two words)
- ▶ the DNA strand that is copied into an mRNA molecule during gene transcription (two words)
- ▶ the initial RNA transcription product (two words)
- ▶ the specific coding relationship between bases and the amino acids they specify; can be expressed in terms of either DNA or RNA bases (two words)
- ▶ a group of three base pairs that code for an individual amino acid
- ▶ the codon that signals the start of a polypeptide chain and initiates translation (two words)
- ▶ the codon that signals the start of a polypeptide chain and initiates translation (two words)
- ▶ the codon that signals the end of a polypeptide chain causes the ribosome to terminate translation (two words)
- ▶ a nucleotide sequence that lies just before a gene and allows for the binding of RNA polymerase
- ▶ a region of the promotor that enables the binding of RNA polymerase (two words)
- ▶ the DNA strand that is not copied but contains the same sequence as the new RNA molecule (two words)
- ▶ a sequence of bases at the end of a gene that signals the RNA polymerase to stop transcribing (two words)
- ▶ a chain of adenine nucleotides that are added to the 3' end of the pre-mRNA molecule to protect it from enzymes in the cytosol (two words)
- ▶ a sequence of seven Gs that is added to the start of a pre-mRNA molecule; ribosomes recognize this site and use it as the site of initial attachment (two words)
- ▶ a sequence of DNA or RNA that codes for part of a gene
- ▶ a non-coding sequence of DNA or RNA
- ▶ an enzyme-protein complex that removes introns from the mRNA
- ▶ protein that binds to introns and signals them for removal (two words)
- ▶ a process that produces different mRNAs from pre-mRNA (exons and introns), allowing more than one possible polypeptide to be made from a single gene (two words)
- ▶ the complementary sequence of base pairs on a tRNA that corresponds with a codon on an mRNA
- ▶ the process by which a tRNA molecule is bound to its corresponding amino acid
- ▶ a molecule of transfer RNA bound to its associated amino acid
- ▶ a particular system for separating a base pair sequence into readable codons (two words)
- ▶ a complex that is formed when multiple ribosomes attach to the same mRNA molecule in order to facilitate rapid translation
- ▶ a hormone produced in the pancreas that lowers the blood glucose level by promoting the uptake of glucose by the body cells
- ▶ a cluster of genes that contains the DNA sequence to regulate the metabolism of lactose (two words)
- ▶ the region in the operon that regulatory factors bind to
- ▶ a protein that binds to the operator to repress gene transcription (two words)
- ▶ a signal molecule that triggers the expression of an operon's genes
- ▶ a signal molecule that binds to a regulatory protein to reduce the expression of an operon's genes
- ▶ a change in a single nucleotide within a gene (two words)
- ▶ the replacement of one base pair in a DNA sequence by another base pair
- ▶ the addition of a base pair (small-scale mutation) or larger coding region (large-scale mutation) to a DNA sequence
- ▶ the removal of a base pair (small-scale mutation) or larger coding region (large-scale mutation) from a DNA sequence
- ▶ two adjacent bases trading places (small-scale mutation) or the reversal of a sequence of DNA (large-scale mutation)
- ▶ a difference in the DNA between individuals caused by point mutations (three words)
- ▶ a mutation that changes a single amino acid in the coding sequence (two words)
- ▶ a mutation that results in a premature stop codon (two words)
- ▶ a mutation that does not alter the resulting sequence of amino acids (two words)
- ▶ a shift in the reading frame resulting in multiple missense and/or nonsense effects (two words)
- ▶ the movement of entire genes or sequences of DNA from one chromosome to another
- ▶ a mutation that is caused by an error in DNA replication (two words)
- ▶ a mutation that is caused by the effect of an environmental agent (two words)
- ▶ an environmental agent that directly alters the DNA within a cell
- ▶ the joint government and private sector research project that sequenced the human genome (three words)
- ▶ non-coding, repeating sequences of DNA that vary in length between homologous chromosomes and between individuals (four words)
- ▶ repetitive DNA sequences, approximately 6500 bp in length on average, interspersed throughout the genome
- ▶ repetitive DNA sequences, approximately 500 bp in length on average, interspersed throughout the genome
- ▶ a small segment of DNA that can move to a different position in the genome
- ▶ a sequence of DNA that is similar to an existing gene but does not code for protein
- ▶ the study of the organization, functions, and relationships of the genomes of different species (two words)
- ▶ a viral enzyme that uses RNA as a template strand to synthesize complementary DNA (two words)
- ▶ a virus that uses reverse transcriptase for replication
- ▶ the use of viral vectors to introduce new genetic material into a cell

W I A Y F F E W J F N F E Z J P O I N T M U T A T I O N G M G R E W C
 F H C F L I A T) A (Y L O P C A T S E N I S I J J Z I J Z E M S F E
 N V M Y E S A R E M Y L O P A N R L K H O K N B T P N S A T A F J Q N
 S X G N I C I L P S E T A N R E T L A C D L E H M D W Q R R X G Q D T
 O Z Q Y W E S Y W V N G A N J I N M M M H G W V U C U O F H Q Y L X R
 B H N D X S C I M O N E G E V I T A R A P M O C A K V G X Z R B L V A
 X R Z O X L L X O V Z X B N Q I W A V F U T E Y B I N T R W D F R I L
 M B N J A U P Z I N V E R S I O N T W E H D G S R I V T D I F M E Y D
 Q U Z W T K B A M E Z X Y I R E F P G P M V O U D W F R R A R E V R O
 L C M Z V O J P N W O V N Y O X N Q H U E F S A N H O A O E A S E S G
 Y K Y L E R E Q O X Y I Y C G A R J T D S B E T Y U C N B G M S R X M
 Z H U I T S C U I R T X F N Q N C A I B I R V D M M G S E V E E S K A
 Q P C N W F A M T I H X P N Y D T Y E E S K A C S A D F N V S N E N P
 B Q B P K F T R A N S D U C T I O N L R E L N R I N I E V A H G T A C
 Q I V S C S S T T O F C W E O F B Z A E H R I U H G D R Z R I E R J O
 Q X X P Q O O A U D P Y R N H L Y C X Z T P M T P E E R D I F R A S R
 M E I L V R H E M O S O E C I L P S C X O H O A R N L N V A T R N I U
 C U I N C R H X T C E G P R I M O E O N P U A N O O E A L B M N S S O
 R O F O T Y R Z N I U V C R U V L B O M Y Z C I M M T D S L U A C E B
 S O D O T R Q M E T D H P T D H A I M R H V Y M Y E I U N E T E R H L
 P O S I X E O V L N O M A T L T T T R R E V L O L P O J G N A D I T L
 N N W S N U M N I A G G H V A A P E P S D G A A O R N P K U T O P O R
 V O L P E G Y P S L E Y A T T F M O R J I X T C P O C S O M I C T P E
 Z D O U Z R S A L N N I K U E Y Z B O K T O I Y E J R N I B O C A Y C
 J O Z M H K P T X A E E M S I N T C T T P P O L D E H O Y E N I S H U
 A C J B C K E E R I T S E Q D H G Y A S E T N T I C W N D R Q T E E D
 N T W C O D O N R A U E U E A R S Y R S P L Z R T T J S O T V E L M N
 R R E Z C Y J L T O N Q S G O P R O E U Y P H N O G N E N A J N I Y I
 L A K F D V M P E A C D V T Z B I I P G L K Q A E Q E N O N L E K Z P
 A T B M F F M N Y X P M O M R L O D O M O L Q D L N W S I D U G C N R
 M S B J Z I A S P E P M C E H A R O K J P A Z Z C I M E T E U V S E E
 O H S C J T D E N A O R U S C E N K R H E C K X U L P M P M B I T E C
 S G B X N B H O W R P O Z R O C B D R V N O Y L N U M U I R S K O N U
 O B B O U T I S P J J W X P P M K K H C O P N L E S W T R E K A P O R
 B B P N Q T N Z C O S W H R L T O A P P E E X P L N I A C P X A C E S
 I S I B R F S U B S T I T U T I O N M K N R I M G I B T S E E H O N O
 R D T E R M I N A T I O N S E Q U E N C E O Q K N L E I N A H T D E R
 C B S R N O S O P S N A R T M Q G Z P C G N T D I N Y O A T U N O G M
 H N H B I F W T R A N S L A T I O N U T E X E X S Q V N R S R X N E R
 I E K R M R Q L I N E S Z I S Y G M I Z N A K G L R K J T Y Z U A N N
 N J P R Y G G X Y O I R V L E M O S Y L O P Y Q K E Y M J B Q I X O A
 L I V N Q T P K F T R A N S L O C A T I O N Y D U C N L K G N A U W R
 Z N I E T O R P R O S S E R P E R M D M I S S E N S E M U T A T I O N
 5 C A P N I E T O R P O E L C U N O B I R L L A M S X E M U N S V C E



Chapter 8

Genetic Technologies

- ▶ a disease in which the blood glucose level is too high because of insufficient production or activity of the hormone insulin (two words)
- ▶ a type of diabetes caused by an inability to produce insulin (three words)
- ▶ a type of diabetes caused by low insulin or an inability to use insulin (three words)
- ▶ the intentional production of new genes and the alteration of genomes by the substitution or introduction of new genetic material (two words)
- ▶ a DNA strand create using DNA pieces from two or more sources (two words)
- ▶ an enzyme that cuts DNA at a specific location in a base sequence; also called restriction endonuclease (two words)
- ▶ a sequence of bases on a DNA strand that restriction enzymes bind to (two words)
- ▶ a fragment that is produced when a DNA strand is cut by a restriction enzyme (two words)
- ▶ the end that remains after restriction enzymes cut straight across a DNA strand; it is more difficult to recombine with another strand than a sticky end (two words)
- ▶ the end that remains after restriction enzymes cut on a zigzag across a DNA strand; it can form hydrogen bonds with a complementary sticky end on any other DNA molecule that has been cut by the same enzyme (two words)
- ▶ a cell that is able to take up foreign DNA from its surroundings (two words)
- ▶ a DNA molecule that is used as a vehicle to transfer foreign genetic material into a cell; for example, a plasmid
- ▶ the number of plasmids of a specific type within a cell (two words)
- ▶ a cell that has taken up a foreign plasmid or virus and has used its cellular machinery to express the foreign DNA (two words)
- ▶ an identical copy of an original target gene that can be made by introducing the target gene into a host cell and having it copied (two words)
- ▶ a diagram that shows restriction enzyme recognition sites and the distances, measured in base pairs, between the sites (two words)
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F	M	P	S	U	T	I	L	L	E	M	S	E	T	E	B	A	I	D	C	X	W	M	D	W	U	V	C	W	K	F	G
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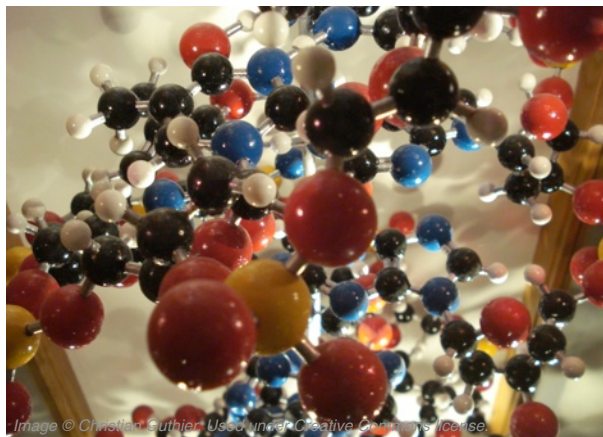


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Unit 3

Molecular Genetics

- ▶ a special protein molecule that is the core around which the DNA strand wraps
- ▶ a small circular section of DNA found in the cytosol of bacteria; replicates independently of the chromosomal DNA
- ▶ the complete set of an organism's hereditary information
- ▶ a change in a genotype or phenotype caused by the direct uptake of genetic material by a cell
- ▶ a virus that targets bacteria
- ▶ a class of nitrogenous bases with a double ring structure; adenine and guanine are in this class
- ▶ a class of nitrogenous bases with a single ring structure; thymine and cytosine are in this class
- ▶ the chemical tendency of adenine to form hydrogen bonds with thymine, and cytosine to form hydrogen bonds with guanine (three words)
- ▶ a mechanism of DNA replication in which each of the two strands of parent DNA is incorporated into a new strand of DNA (two words)
- ▶ a specific sequence of DNA that acts as a starting point for replication (two words)
- ▶ a replication enzyme that separates and unwinds the DNA strands
- ▶ the point of separation of the two parent DNA strands during replication (two words)
- ▶ a class of enzymes that relieve tension caused by the unwinding of parent DNA; cleave one or two of the DNA strands, allow the strand(s) to untwist, and then rejoin the strand(s)
- ▶ a replication enzyme that prevents parent DNA strands from annealing to each other once they have been separated by helicase (three words)
- ▶ the separating of DNA in both directions during replication (two words)
- ▶ a building block and energy source for replicating DNA (two words)
- ▶ a replication enzyme that produces RNA primers (two words)
- ▶ a replication molecule that acts as a starting point for replication (two words)
- ▶ a prokaryotic replication enzyme that builds new DNA strands from nucleotides (three words)
- ▶ the DNA strand that is copied in the direction toward the replication fork (two words)
- ▶ the DNA strand that is copied in the direction away from the replication fork (two words)
- ▶ the piece of new DNA on the lagging strand (two words)
- ▶ a prokaryotic replication enzyme that fills in gaps in the lagging strand between Okazaki fragments; also proofreads the final strands (three words)
- ▶ an enzyme that catalyzes the formation of a phosphodiester bond between two DNA strands, as well as between Okazaki fragments (two words)
- ▶ a prokaryotic replication enzyme that repairs damage to DNA, including damage that occurs between replication events (three words)
- ▶ a unit of DNA storage, consisting of eight histones with DNA strands wrapped around them; the DNA around it is about 147 nucleotides in length
- ▶ a group of six nucleosomes
- ▶ the continuous twisting of prokaryotic DNA, which reduces the volume of the DNA
- ▶ a repeating sequence of DNA at the end of a chromosome that protects coding regions from being lost during replication
- ▶ the period in a cell's lifespan when it loses the ability to divide and grow; often referred to as cell aging (two words)
- ▶ the total number of times that an ordinary cell can divide (two words)
- ▶ an enzyme that adds new telomere sequences to the ends of chromosomes
- ▶ the hypothesis, proposed by Beadle and Tatum, that each gene is unique and codes for the synthesis of a single enzyme (four words)
- ▶ the hypothesis that each gene is unique and codes for the synthesis of a single polypeptide; the restated version of the one gene-one enzyme hypothesis (four words)
- ▶ the fundamental principle of molecular genetics, which states that genetic information flows from DNA to RNA to proteins (two words)
- ▶ mechanism by which the information coded in nucleic acids of DNA is copied into the nucleic acids of RNA; something rewritten in the same language
- ▶ mechanism by which the information coded in nucleic acids of RNA is copied into the amino acids proteins
- ▶ the end product of the transcription of a gene; mRNA is translated by ribosomes into a protein (two words)
- ▶ a carrier molecule that binds to a specific amino acid and adds the amino acid to the growing polypeptide chain (two words)
- ▶ an RNA molecule within the ribosome that bonds the correct amino acid to the polypeptide chain (two words)
- ▶ an enzyme that reads a DNA strand and creates a complementary strand of RNA (two words)
- ▶ the DNA strand that is copied into an mRNA molecule during gene transcription (two words)
- ▶ the initial RNA transcription product (two words)
- ▶ the specific coding relationship between bases and the amino acids they specify; can be expressed in terms of either DNA or RNA bases (two words)
- ▶ a group of three base pairs that code for an individual amino acid
- ▶ the codon that signals the start of a polypeptide chain and initiates translation (two words)
- ▶ the codon that signals the start of a polypeptide chain and initiates translation (two words)
- ▶ the codon that signals the end of a polypeptide chain causes the ribosome to terminate translation (two words)
- ▶ a nucleotide sequence that lies just before a gene and allows for the binding of RNA polymerase
- ▶ a region of the promoter that enables the binding of RNA polymerase (two words)
- ▶ the DNA strand that is not copied but contains the same sequence as the new RNA molecule (two words)
- ▶ a sequence of bases at the end of a gene that signals the RNA polymerase to stop transcribing (two words)
- ▶ a chain of adenine nucleotides that are added to the 3' end of the pre-mRNA molecule to protect it from enzymes in the cytosol (two words)
- ▶ a sequence of seven Gs that is added to the start of a pre-mRNA molecule; ribosomes recognize this site and use it as the site of initial attachment (two words)
- ▶ a sequence of DNA or RNA that codes for part of a gene
- ▶ a non-coding sequence of DNA or RNA
- ▶ an enzyme-protein complex that removes introns from the mRNA
- ▶ protein that binds to introns and signals them for removal (two words)
- ▶ a process that produces different mRNAs from pre-mRNA (exons and introns), allowing more than one possible polypeptide to be made from a single gene (two words)
- ▶ the complementary sequence of base pairs on a tRNA that corresponds with a codon on an mRNA
- ▶ the process by which a tRNA molecule is bound to its corresponding amino acid
- ▶ a molecule of transfer RNA bound to its associated amino acid
- ▶ a particular system for separating a base pair sequence into readable codons (two words)
- ▶ a complex that is formed when multiple ribosomes attach to the same mRNA molecule in order to facilitate rapid translation
- ▶ a hormone produced in the pancreas that lowers the blood glucose level by promoting the uptake of glucose by the body cells
- ▶ a cluster of genes that contains the DNA sequence to regulate the metabolism of lactose (two words)
- ▶ the region in the operon that regulatory factors bind to
- ▶ a protein that binds to the operator to repress gene transcription (two words)
- ▶ a signal molecule that triggers the expression of an operon's genes
- ▶ a signal molecule that binds to a regulatory protein to reduce the expression of an operon's genes
- ▶ a change in a single nucleotide within a gene (two words)
- ▶ the replacement of one base pair in a DNA sequence by another base pair
- ▶ the addition of a base pair (small-scale mutation) or larger coding region (large-scale mutation) to a DNA sequence
- ▶ the removal of a base pair (small-scale mutation) or larger coding region (large-scale mutation) from a DNA sequence
- ▶ two adjacent bases trading places (small-scale mutation) or the reversal of a sequence of DNA (large-scale mutation)
- ▶ a difference in the DNA between individuals caused by point mutations (three words)
- ▶ a mutation that changes a single amino acid in the coding sequence (two words)
- ▶ a mutation that results in a premature stop codon (two words)
- ▶ a mutation that does not alter the resulting sequence of amino acids (two words)
- ▶ a shift in the reading frame resulting in multiple missense and/or nonsense effects (two words)
- ▶ the movement of entire genes or sequences of DNA from one chromosome to another
- ▶ a mutation that is caused by an error in DNA replication (two words)
- ▶ a mutation that is caused by the effect of an environmental agent (two words)
- ▶ an environmental agent that directly alters the DNA within a cell
- ▶ the joint government and private sector research project that sequenced the human genome (three words)
- ▶ non-coding, repeating sequences of DNA that vary in length between homologous chromosomes and between individuals (four words)
- ▶ repetitive DNA sequences, approximately 6500 bp in length on average, interspersed throughout the genome
- ▶ repetitive DNA sequences, approximately 500 bp in length on average, interspersed throughout the genome
- ▶ a small segment of DNA that can move to a different position in the genome
- ▶ a sequence of DNA that is similar to an existing gene but does not code for protein
- ▶ the study of the organization, functions, and relationships of the genomes of different species (two words)
- ▶ a viral enzyme that uses RNA as a template strand to synthesize complementary DNA (two words)
- ▶ a virus that uses reverse transcriptase for replication
- ▶ the use of viral vectors to introduce new genetic material into a cell
- ▶ a disease in which the blood glucose level is too high because of insufficient production or activity of the hormone insulin (two words)
- ▶ a type of diabetes caused by an inability to produce insulin (three words)
- ▶ a type of diabetes caused by low insulin or an inability to use insulin (three words)
- ▶ the intentional production of new genes and the alteration of genomes by the substitution or introduction of new genetic material (two words)
- ▶ a DNA strand create using DNA pieces from two or more sources (two words)
- ▶ an enzyme that cuts DNA at a specific location in a base sequence; also called restriction endonuclease (two words)
- ▶ a sequence of bases on a DNA strand that restriction enzymes bind to (two words)
- ▶ a fragment that is produced when a DNA strand is cut by a restriction enzyme (two words)
- ▶ the end that remains after restriction enzymes cut straight across a DNA strand; it is more difficult to recombine with another strand than a sticky end (two words)
- ▶ the end that remains after restriction enzymes cut on a zigzag across a DNA strand; it can form hydrogen bonds with a complementary sticky end on any other DNA molecule that has been cut by the same enzyme (two words)
- ▶ a cell that is able to take up foreign DNA from its surroundings (two words)
- ▶ a DNA molecule that is used as a vehicle to transfer foreign genetic material into a cell; for example, a plasmid
- ▶ the number of plasmids of a specific type within a cell (two words)
- ▶ a cell that has taken up a foreign plasmid or virus and has used its cellular machinery to express the foreign DNA (two words)
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 C M E C N N K I S O A Z U T R S I P C I N P I M L V I O F T F D C O E T T R I U U L Y U M S C H C R R N
 A R L U T I I S L C P Y R C A I D R C Y N Q S T D J A L A E Y Q R I E D H E W T O O S Y E T I A I O I O
 T O L W P N H M L S E L Z M T H P O I T N V G O A I F F A R X V C Y T L E E S A D P I D T R T R L T C I
 I F Q B F O O C E R B K H X I P Q T T O I V E S A T E H E N E P O F T A C N S T C L N I H A E M P E T T
 O S I Q G I S P C E R D B F V R D E E Y E M H R U T U B L A D V R X D R M U H I K G S O O N N I E I I A
 N N I A M T T J J P N E H R E O O I N F T V J Z S O D M H T K O E H X W R O N O S U U N D D E N R N O Z
 M A E N U A C D D L X S Y A G M D N E W O Z Y D C I M T E E M M P O J C N R S N C S L E M E G G F W N I
 U R S R A T E H Y I E I R M E Y N I G T R C G N Y D O W N S N H R C S W O O R Z N U I L A M Z S R T F D
 B T A T S U L V H C M L H E N L O N X I P H T A B R G N S P N E E Y U L D T D X E T N O L Y I U P I R I
 Y R R L N M L W R A P E U S O O Z T T X O J N P I B E L I L Y E S L B W O I Z R M I V S A Z H S G E A R
 C E E Y B E Y G N T V N M H M P S G I N E F O O Z J N V S I X E S L S E C H L E O L K M G N A T F T G B
 I A M C S S L G A I A T A I I E L V P G L N I L N E E Q E C M M O S T E V H H C S L E D G E Z R X A M Y
 N D Y A B N G F P O R M N F C D U B D D C O T Y D C T R H I Q O R C I Z M J O U O E S Q I N R A I H E H
 O I L O P E E L O N I U G T S I G P Z I U I C M H N I J T N H S U T T M U D X D E M A H N O N N V P N W
 D N O M B S N Y L O A T E M M T W F R R N T U E X E C A O G O Y Q H U V X N W N C S T K G I X S A S T U
 O G P I T N E P Y R B A N U P O T A R Y O A D R O U E W P D S L D R T M Z A L I I E P H S T H L Q O F C
 C F A N H O T R M I L T O T N E R M J F B T S A K Q N A Y K V O H K I O W S K O L T I K T C E O V H N D
 I R N A G N H O E G E I M A S L A N Z J I U N S V E G G H R Y P T Y O X P E G M P E R V R I L C L P O R
 T A D L B K E M R I N O E T B C R I O N R M A E A S I N E T S X A L N R I Q W B S B C Z A R I A M I L G
 N M S X E G R O A N U N P I G U O O N O L T R I L N N L D L Q Q E P H V N U G T V A S E N T C T A R N P
 A E I G N S A T S W M Y R I G N T C P D L N T T A O E N I Z E U N D R J E E E F R I N B D S A I L T E G
 R K K U I R P O E K B H O N I E A E R O A I G D Z I E W T X L L L T B L U N S Z A D A V O E S O H E M X
 K B H M T U Y R J L E J J X F L R N E C M O A L B T R D P Q G K E C U Q W C G N E N R L Q R E N M D L T
 N I N S E R T I O N R P E D N G E T P P S P X T M A I T E I I R R C A S X I L M R E T I H C A U S I D M
 Q P M R L D Y F V W T Y C E N N P E L O Y K V P L N K F P F M R J U T M Q N E M O T E C T G R X U S K R
 S J Q J J X I R Y R A R T G V I O S I T T X D U X I G K Y D I T H O R R G R M O N S E Q D S U V O M E
 M S M E W F D X N D N I M S D S N I C S M B F H T M J I L Y A H F R Z T O O M X Q U R V T H S K W E I M
 T R W A Z E U Z W N D M B Z A G O S A A T I O S R R E N O T S I H I L T S P D D M L E C X Z P O U L V I
 A A E A H N E C K A E I E A A N R Y T K E T W B A E U D P F F S J L W R P Y H L U B V C N D G D D C H R
 C N S M Z Y U P I M M D S I J C E N I Z I V D Y N T J Z E A R W Z M U L G X H O A M E O O B P H E U Q P
 H P E V I B F C X I R I A B Z Q P T O T O Q O S S Z E D N H V V Y C O Y O O W I R R R S V G G J V N R A
 P Q U I Y R G P O C E N M A B G O P N Z O R L G P L B O Y T V E V E P X G B K E T F H S I M L N X N
 D D E R S Y P R P R P E I F M N C D F J S A Q K O I U R E S T R I C T I O N M A P F S N P T F Z G B A D
 V W A B I W Y A W O E L R P A P A Q O U F T S E S F E N N K P K B E O U L J Q G O R Y I E Q P Z Z P Q O
 W A P T Z N P T N A A S P Z I V L E R V D Q C U O W M E E E Z Y R B L Y X Z H H N G B P S C G E P J I P
 Y T Q H U H E X V R T Q A E T B T P K D K R U E N U X O G W J P P P U M S S A N R R E F S N A R T X X O
 C T I M Z I G N X R S E N O I T A L S N A R T Q Q O B V E A K A P S E U D O G E N E H K O Z M S E N I L
 S Q G B R Z C M I A B P R R G X S H Y B T X S K N U I V X V R X R Y S N L Z M E S S E N G E R N A K
 X T W D N A P O L Y M E R A S E I I A H H J G G E D X O P Z U Z I U L V X X M Z O Y R A L E I V X R L



Chapter 9

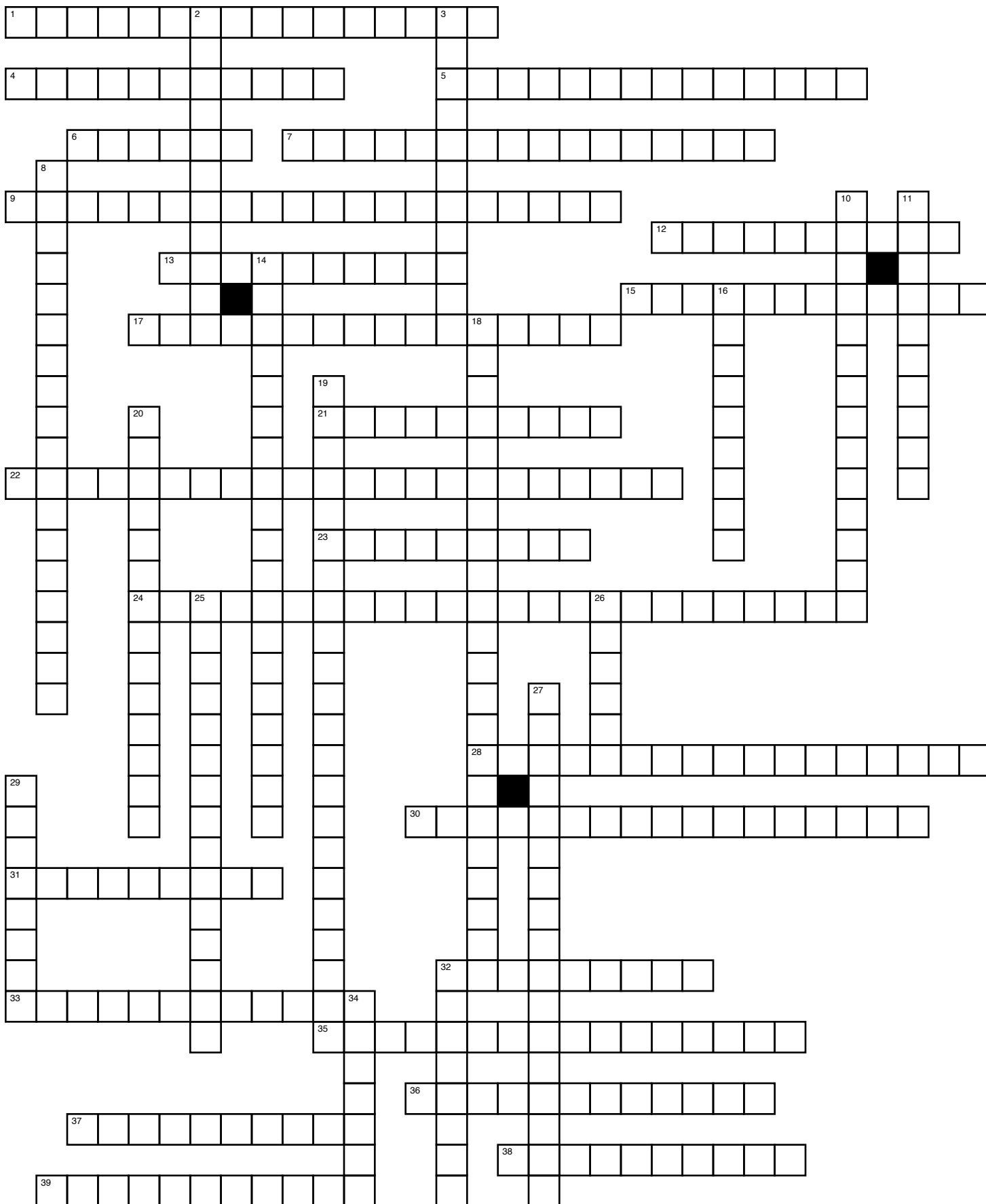
Homeostasis: A Fine Balance

Across

1. the main organ of excretion in insects, which is used to carry wastes to the intestines (two words)
4. the solution on one side of a permeable membrane that has the higher concentration of water
5. the process of actively regulating the osmotic pressure of bodily fluids and cells
6. the element of a feedback system that detects changes in the environment
7. the regulation of internal temperature by negative feedback mechanisms
9. a system that monitors internal and external conditions and changes bodily functions to maintain homeostasis (two words)
12. two solutions that have equal water concentrations
13. a state of torpor that enables an animal to survive the summer by reducing the demand for energy
15. the solution on one side of a permeable membrane that has the lower concentration of water
17. the response of a system that acts to increase the effect of any changes made to the system (two words)
21. an animal that maintains a stable body temperature regardless of the temperature of the external environment
22. a net of capillaries in the nephrons that reabsorb essential ions and minerals from filtered blood (two words)
23. a membrane protein that passively transports water molecules
24. the duct portion of a nephron that connects the Bowman's capsule to the loop of Henle (three words)
28. a vessel that carries away filtered blood from the nephrons in the human kidney (two words)
30. the fluid that surrounds the body cells (two words)
31. an animal that maintains its body temperature by internal mechanisms
32. the removal of waste materials from the blood and interstitial fluid
33. the transfer of water, ions, and nutrients back to the interstitial fluid via passive and active transport
35. the response of a system that acts to maintain equilibrium by compensating for any changes made to the system (two words)
36. an animal whose body temperature varies with, and often matches, the temperature of the external environment
37. the element of a feedback system that compares existing conditions with ideal conditions
38. a network of capillaries within the Bowman's capsule that performs the first step in the filtration of blood
39. a state of greatly reduced metabolic rate and activity that enables an animal to survive the winter by reducing the demand for energy when food is unavailable
11. the process in which blood and fluid pass through a selectively permeable membrane
14. the extracellular fluid, which consists of the fluid that surrounds the cells and tissues in the body and the plasma portion of the blood (two words)
16. an animal that maintains its body temperature by absorbing thermal energy from the environment
18. the duct portion of a nephron that connects the loop of Henle to the ducts that lead to the renal pelvis (three words)
19. the process by which an animal gradually adjusts to temperature changes in its environment (two words)
20. an excretory organ in some invertebrates, which is used to reabsorb and eliminate wastes
25. the pressure that results from a difference in solute concentration between the two sides of a selectively permeable membrane (two words)
26. a short-term state of reduced metabolic rate and body temperature that reduces the demand for energy during the night or day
27. a vessel that supplies blood to the nephrons in the human kidney (two words)
29. the element (or elements) of a feedback system that act to return the system to its optimal state
32. the optimal value for a given variable of a system (two words)
34. the tiny functional unit of the kidney that filters wastes from the blood

Down

2. the physiological state of the body in which internal physical and chemical conditions are kept within a range that is suitable for life processes
3. the U-shaped part of the duct that connects the proximal convoluted tubule to the distal convoluted tubule (three words)
8. a structure in a single-celled organism that maintains osmotic equilibrium by pumping excess fluid out of the cell (two words)
10. a small folded structure in the human kidney that encircles the glomerulus (two words)





Chapter 10

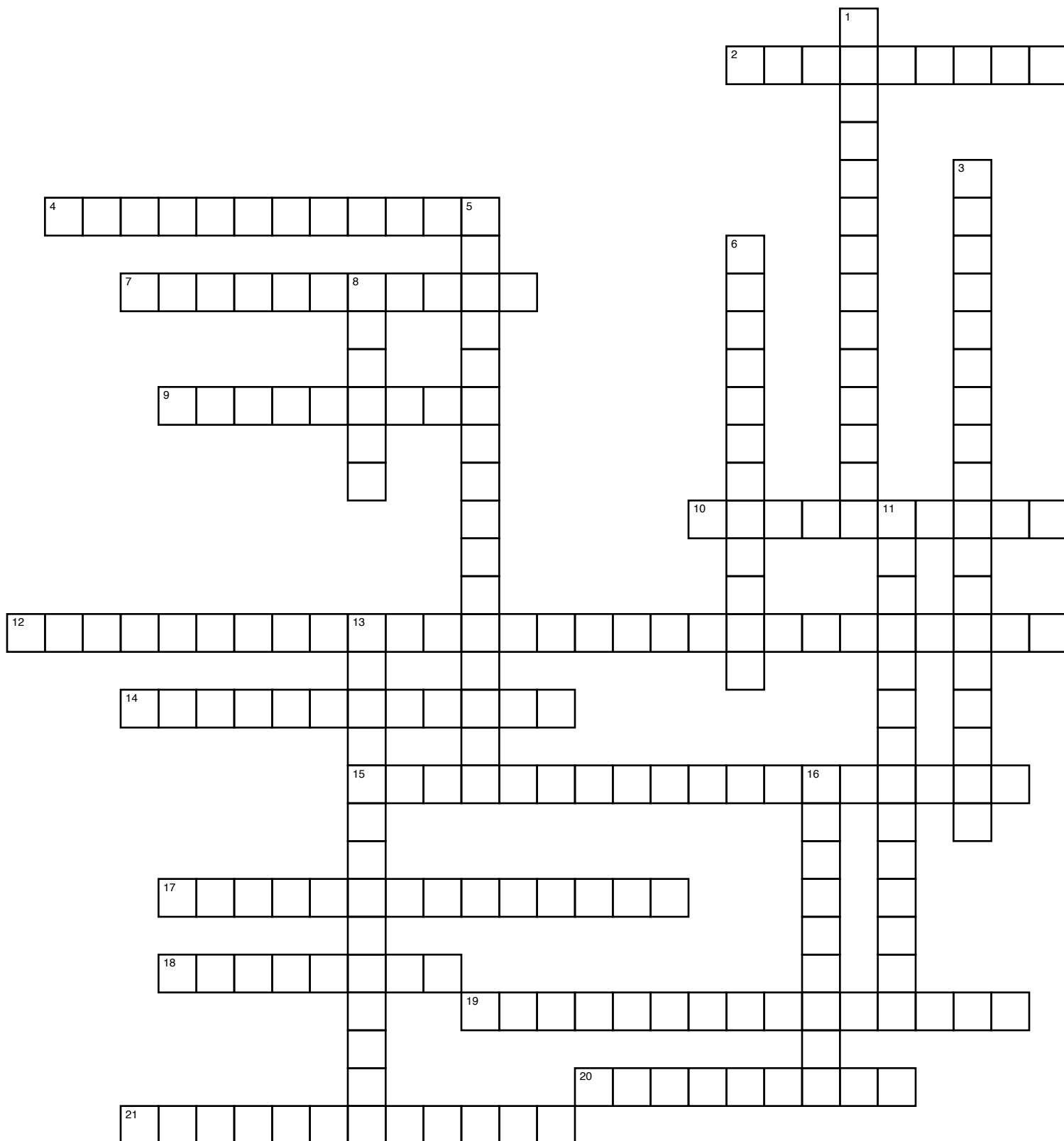
The Endocrine System

Across

2. predominantly male sex hormones, including testosterone, which control sexual development and reproduction
4. the region of the brain that releases hormones to control the pituitary gland, which, in turn, controls other endocrine glands
7. an endocrine gland located in or on the brain of vertebrates, which secretes the hormone melatonin to regulate biological rhythms (two words)
9. the end of a female's reproductive capability, after which menstruation ceases and female hormone levels drop
10. predominantly female sex hormones, including progesterone, which control the menstrual cycle
12. a hormone released by the hypothalamus that controls the release of LH and FSH from the anterior pituitary, which, in turn, control the synthesis and release of the male or female hormones in the gonads (two words)
14. the main male sex hormone, which stimulates and controls the development of male secondary sexual characteristics
15. endocrine cell clusters inside the pancreas that produce insulin and glucagon (three words)
17. the monthly cycle of events in a sexually mature female, which prepares the uterus for the implantation of a fertilized egg (two words)
18. a hormone produced by alpha cells in the pancreas that raises the blood glucose level by promoting the breakdown of glycogen in the liver
19. the production and development of sperm cells in the testes
20. the production of eggs, or ova, from oocytes in the ovaries by two meiotic divisions
21. an endocrine gland located in the throat that is regulated by the hypothalamus-pituitary system (two words)
5. a hormone created by humans that behaves like a natural hormone (two words)
6. a hormone produced by neurons, such as in the hypothalamus, which controls the production of other hormones in the pituitary gland
8. glands responsible for the production of sex hormones, as well as the egg and sperm cells; called testes in males and ovaries in females
11. a hormone composed of cholesterol that is not very water soluble; usually passes through the cell membrane and acts on receptors inside the cell (two words)
13. a two-lobed gland within the cranial cavity, which produces hormones that control the other endocrine glands (two words)
16. predominantly female sex hormones, including estradiol, which trigger sexual development

Down

1. a hormone composed of chains of amino acids that is water soluble; usually acts on cell membrane receptors (two words)
3. a hormone secreted by the parathyroid glands that controls calcium and phosphate levels in the blood (two words)





Chapter 11

The Nervous System

Across

1. the period of time during which the threshold required for the generation of an action potential is much higher than normal (two words)
4. three layers of connective tissue that surround and protect the brain and spinal cord
6. a subdivision of the efferent system; composed of efferent (motor) neurons that carry signals to skeletal muscles in response to external stimuli (two words)
12. the brain region that is involved in motor activities and sensory information; the largest and most developed region of the brain
14. the tissue of the brain and spinal cord, composed primarily of axons of neurons; in the spinal cord, it surrounds the grey matter (two words)
16. the 31 pairs of nerves within the somatic system that transmit motor, sensory, and autonomic signals between the spinal cord and the rest of the body (two words)
23. circulating fluid that surrounds the membranes of the brain and spinal cord; provides neural connection to the endocrine system (two words)
25. a subdivision of the efferent system; regulates the internal environment (two words)
27. the tendency for some sensory receptors to become less sensitive when stimulated repeatedly (two words)
28. a nerve cell that is capable of conducting nerve impulses
30. the voltage difference across a nerve cell membrane when the nerve is excited (two words)
32. the brain region that interprets sensory input and signals the cerebrum
34. a regularly occurring gap between sections of myelin sheath along the axon (three words)
37. the potential at which an action potential is generated by a neuron (two words)
38. all parts of the nervous system, excluding the brain and spinal cord; relays information between the central nervous system and other parts of the body (three words)
40. a non-conducting cell that is important for the structural support and metabolism of nerve cells (two words)
41. an insulated covering over the axon of a nerve cell (two words)
42. a functional connection between neurons or between neurons and effectors
44. a neuron that carries impulses from sensory receptors to the central nervous system; also called a sensory neuron (two words)
45. a synapse in which a neurotransmitter moves from a presynaptic cell to a postsynaptic cell through the synaptic cleft (two words)
17. a synapse in which the presynaptic cell makes direct contact with the postsynaptic cell, allowing current to flow via gap junctions between the cells (two words)
18. the voltage difference across a nerve cell membrane of an unstimulated neuron; usually negative (two words)
19. the reception, transmission, and integration of nerve impulses by neurons, and the response to these impulses (two words)
20. a chemical that is released from vesicles into synapses to facilitate nerve signal transmission
21. the hindbrain region that connects the spinal cord to the cerebellum; important in autonomic nerve control (two words)
22. a projection of cytosol that carries signals toward the nerve cell body
23. the outermost layer of the cerebral hemispheres (two words)
24. one of two subdivisions of the autonomic nervous system; stimulates body actions that acquire and conserve energy (two words)
26. one of two subdivisions of the autonomic nervous system; increases energy consumption and prepares the body for action (two words)
29. a protein embedded in the plasma membrane that allows ions to pass through it (two words)
31. the coordination of the receptor, afferent neuron, interneuron, efferent neuron, and effector in response to a stimulus (two words)
33. the electrical potential of a membrane, which is caused by an imbalance in charges on either side of the membrane (two words)
35. a neuron that carries impulses from the central nervous system to skeletal muscles; also known as a motor neuron (two words)
36. the tiny gap between presynaptic and postsynaptic cells in a chemical synapse, across which the neurotransmitter diffuses (two words)
39. the tissue of the brain and spinal cord, where the cell bodies and dendrites of neurons are located (two words)
43. an extension of cytosol that carries nerve signals away from the nerve cell body

Down

2. the brain region that transfers nerve signals between the cerebellum and the medulla
3. a neural circuit that travels through the spinal cord but does not require the coordination of the brain; allows for reflex actions (two words)
5. a local circuit neuron of the central nervous system that relays impulses between afferent (sensory) neurons and efferent (motor) neurons
7. the component of the peripheral nervous system that receives input through receptors and transmits the input to the central nervous system (two words)
8. the body's coordinating centre for mechanical and chemical actions; made up of the brain and spinal cord (three words)
9. the component of the peripheral nervous system that carries signals away to the effectors (muscles and glands) (two words)
10. the 12 pairs of nerves within the parasympathetic division of the autonomic system, which emerge directly from the brain and serve the head, neck, and body trunk (two words)
11. a negative feedback mechanism that attempts to maintain blood pressure (two words)
13. the hindbrain region that is involved in muscle movement and balance
15. a barrier formed by tight junctions between endothelial cells in the capillaries in the brain, which blocks the movement of most substances into the brain via the bloodstream (two words)

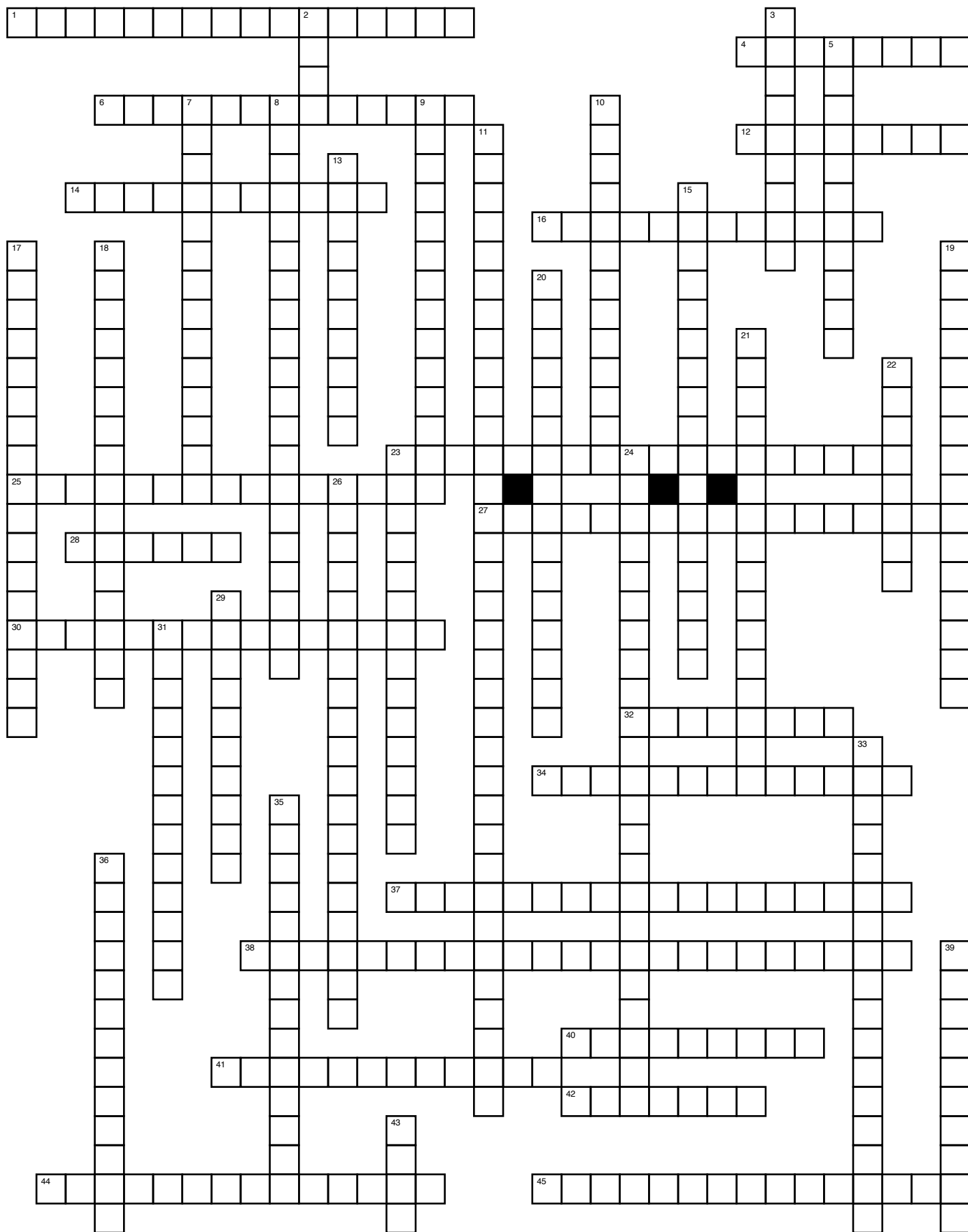




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Unit 4

Homeostasis

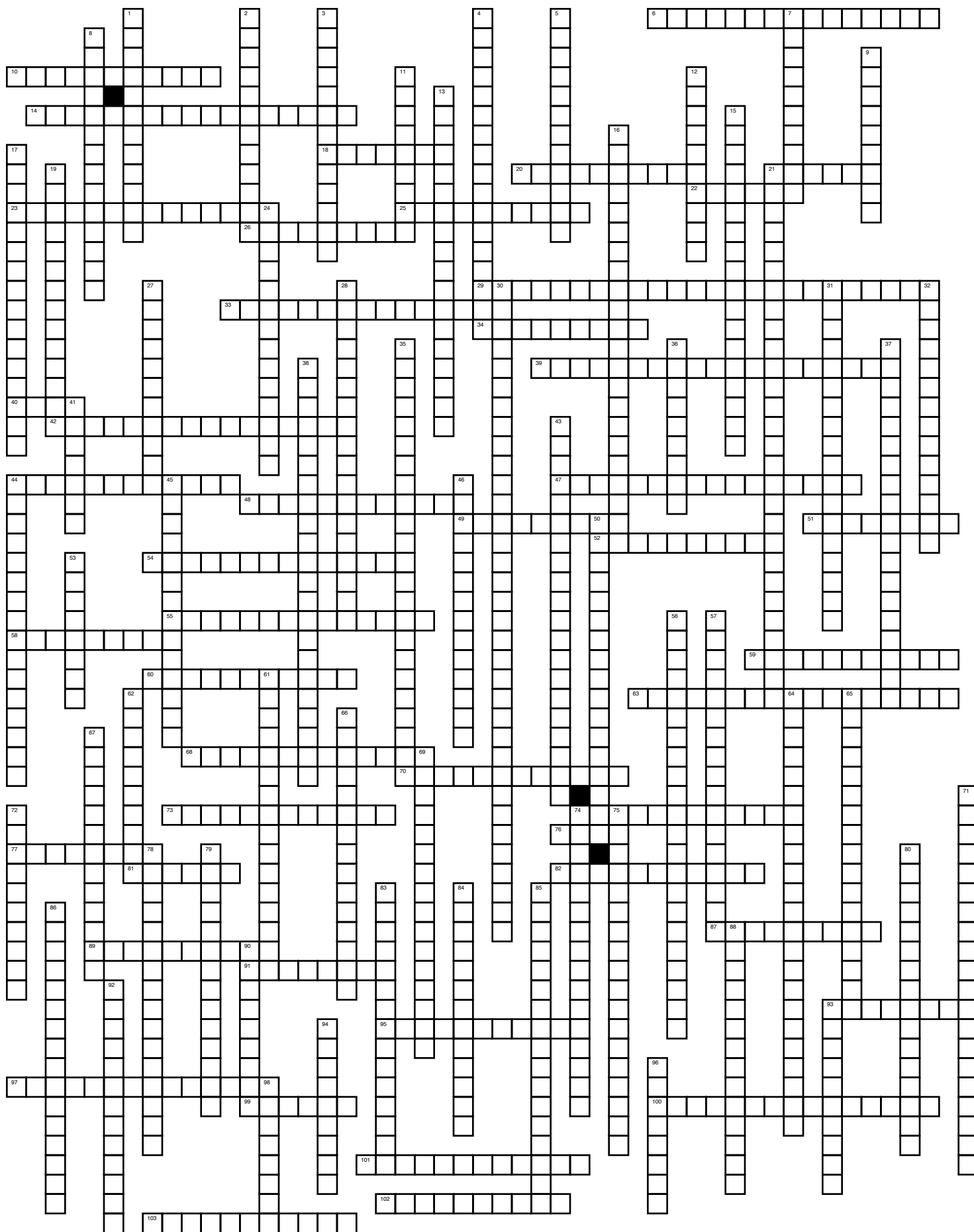
Across

6. a subdivision of the efferent system; regulates the internal environment (two words)
10. the physiological state of the body in which internal physical and chemical conditions are kept within a range that is suitable for life processes
14. the fluid that surrounds the body cells (two words)
18. a functional connection between neurons or between neurons and effectors
20. a network of capillaries within the Bowman's capsule that performs the first step in the filtration of blood
21. glands responsible for the production of sex hormones, as well as the egg and sperm cells; called testes in males and ovaries in females
22. a short-term state of reduced metabolic rate and body temperature that reduces the demand for energy during the night or day
23. the component of the peripheral nervous system that receives input through receptors and transmits the input to the central nervous system (two words)
25. two solutions that have equal water concentrations
26. the removal of waste materials from the blood and interstitial fluid
29. the duct portion of a nephron that connects the Bowman's capsule to the loop of Henle (three words)
33. a synapse in which a neurotransmitter moves from a presynaptic cell to a postsynaptic cell through the synaptic cleft (two words)
34. an animal that maintains its body temperature by internal mechanisms
39. one of two subdivisions of the autonomic nervous system; increases energy consumption and prepares the body for action (two words)
40. an extension of cytosol that carries nerve signals away from the nerve cell body
42. a chemical that is released from vesicles into synapses to facilitate nerve signal transmission
44. a hormone produced by neurons, such as in the hypothalamus, which controls the production of other hormones in the pituitary gland
47. the regulation of internal temperature by negative feedback mechanisms
48. the region of the brain that releases hormones to control the pituitary gland, which, in turn, controls other endocrine glands
49. the end of a female's reproductive capability, after which menstruation ceases and female hormone levels drop
51. three layers of connective tissue that surround and protect the brain and spinal cord
52. a state of torpor that enables an animal to survive the summer by reducing the demand for energy
54. a hormone composed of cholesterol that is not very water soluble; usually passes through the cell membrane and acts on receptors inside the cell (two words)
55. a neuron that carries impulses from sensory receptors to the central nervous system; also called a sensory neuron (two words)
58. a non-conducting cell that is important for the structural support and metabolism of nerve cells (two words)
59. the U-shaped part of the duct that connects the proximal convoluted tubule to the distal convoluted tubule (three words)
60. the solution on one side of a permeable membrane that has the higher concentration of water
63. the electrical potential of a membrane, which is caused by an imbalance in charges on either side of the membrane (two words)
68. the 12 pairs of nerves within the parasympathetic division of the autonomic system, which emerge directly from the brain and serve the head, neck, and body trunk (two words)
70. an insulated covering over the axon of a nerve cell (two words)
73. an endocrine gland located in the throat that is regulated by the hypothalamus-pituitary system (two words)
74. an animal whose body temperature varies with, and often matches, the temperature of the external environment
76. the brain region that transfers nerve signals between the cerebellum and the medulla
77. the element (or elements) of a feedback system that act to return the system to its optimal state
81. a nerve cell that is capable of conducting nerve impulses
82. a state of greatly reduced metabolic rate and activity that enables an animal to survive the winter by reducing the demand for energy when food is unavailable
87. an animal that maintains its body temperature by absorbing thermal energy from the environment

89. a protein embedded in the plasma membrane that allows ions to pass through it (two words)
91. the optimal value for a given variable of a system (two words)
93. the brain region that is involved in motor activities and sensory information; the largest and most developed region of the brain
95. an endocrine gland located in or on the brain of vertebrates, which secretes the hormone melatonin to regulate biological rhythms (two words)
97. a two-lobed gland within the cranial cavity, which produces hormones that control the other endocrine glands (two words)
99. the element of a feedback system that detects changes in the environment
100. the voltage difference across a nerve cell membrane when the nerve is excited (two words)
101. the transfer of water, ions, and nutrients back to the interstitial fluid via passive and active transport
102. an animal that maintains a stable body temperature regardless of the temperature of the external environment
103. a local circuit neuron of the central nervous system that relays impulses between afferent (sensory) neurons and efferent (motor) neurons

Down

1. the main male sex hormone, which stimulates and controls the development of male secondary sexual characteristics
2. the 31 pairs of nerves within the somatic system that transmit motor, sensory, and autonomic signals between the spinal cord and the rest of the body (two words)
3. a subdivision of the efferent system; composed of efferent (motor) neurons that carry signals to skeletal muscles in response to external stimuli (two words)
4. a synapse in which the presynaptic cell makes direct contact with the postsynaptic cell, allowing current to flow via gap junctions between the cells (two words)
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7. the element of a feedback system that compares existing conditions with ideal conditions
8. a hormone composed of chains of amino acids that is water soluble; usually acts on cell membrane receptors (two words)
9. the production of eggs, or ova, from oocytes in the ovaries by two meiotic divisions
11. a membrane protein that passively transports water molecules
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13. circulating fluid that surrounds the membranes of the brain and spinal cord; provides neural connection to the endocrine system (two words)
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37. the extracellular fluid, which consists of the fluid that surrounds the cells and tissues in the body and the plasma portion of the blood (two words)
38. the duct portion of a nephron that connects the loop of Henle to the ducts that lead to the renal pelvis (three words)
41. the tiny functional unit of the kidney that filters wastes from the blood
43. the body's coordinating centre for mechanical and chemical actions; made up of the brain and spinal cord (three words)
44. the reception, transmission, and integration of nerve impulses by neurons, and the response to these impulses (two words)
45. the monthly cycle of events in a sexually mature female, which prepares the uterus for the implantation of a fertilized egg (two words)
46. the process of actively regulating the osmotic pressure of bodily fluids and cells
50. the tendency for some sensory receptors to become less sensitive when stimulated repeatedly (two words)
53. a hormone produced by alpha cells in the pancreas that raises the blood glucose level by promoting the breakdown of glycogen in the liver
56. the process by which an animal gradually adjusts to temperature changes in its environment (two words)
57. a vessel that supplies blood to the nephrons in the human kidney (two words)
61. the main organ of excretion in insects, which is used to carry wastes to the intestines (two words)
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67. the coordination of the receptor, afferent neuron, interneuron, efferent neuron, and effector in response to a stimulus (two words)
69. a hormone created by humans that behaves like a natural hormone (two words)
71. a system that monitors internal and external conditions and changes bodily functions to maintain homeostasis (two words)
72. the tissue of the brain and spinal cord, where the cell bodies and dendrites of neurons are located (two words)
74. the response of a system that acts to increase the effect of any changes made to the system (two words)
75. endocrine cell clusters inside the pancreas that produce insulin and glucagon (three words)
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79. a small folded structure in the human kidney that encircles the glomerulus (two words)
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83. the pressure that results from a difference in solute concentration between the two sides of a selectively permeable membrane (two words)
84. a regularly occurring gap between sections of myelin sheath along the axon (three words)
85. a barrier formed by tight junctions between endothelial cells in the capillaries in the brain, which blocks the movement of most substances into the brain via the bloodstream (two words)
86. the voltage difference across a nerve cell membrane of an unstimulated neuron; usually negative (two words)
88. the outermost layer of the cerebral hemispheres (two words)
90. predominantly female sex hormones, including estradiol, which trigger sexual development
92. the tiny gap between presynaptic and postsynaptic cells in a chemical synapse, across which the neurotransmitter diffuses (two words)
93. the hindbrain region that is involved in muscle movement and balance
94. predominantly male sex hormones, including testosterone, which control sexual development and reproduction
96. the brain region that interprets sensory input and signals the cerebrum
98. a projection of cytosol that carries signals toward the nerve cell body





Chapter 9

Homeostasis: A Fine Balance

- ▶ the physiological state of the body in which internal physical and chemical conditions are kept within a range that is suitable for life processes
- ▶ the extracellular fluid, which consists of the fluid that surrounds the cells and tissues in the body and the plasma portion of the blood (two words)
- ▶ the fluid that surrounds the body cells (two words)
- ▶ a system that monitors internal and external conditions and changes bodily functions to maintain homeostasis (two words)
- ▶ the response of a system that acts to maintain equilibrium by compensating for any changes made to the system (two words)
- ▶ the element of a feedback system that detects changes in the environment
- ▶ the element of a feedback system that compares existing conditions with ideal conditions
- ▶ the optimal value for a given variable of a system (two words)
- ▶ the element (or elements) of a feedback system that act to return the system to its optimal state
- ▶ the response of a system that acts to increase the effect of any changes made to the system (two words)
- ▶ the regulation of internal temperature by negative feedback mechanisms
- ▶ an animal that maintains a stable body temperature regardless of the temperature of the external environment
- ▶ an animal whose body temperature varies with, and often matches, the temperature of the external environment
- ▶ an animal that maintains its body temperature by internal mechanisms
- ▶ an animal that maintains its body temperature by absorbing thermal energy from the environment
- ▶ the process by which an animal gradually adjusts to temperature changes in its environment (two words)
- ▶ a short-term state of reduced metabolic rate and body temperature that reduces the demand for energy during the night or day
- ▶ a state of greatly reduced metabolic rate and activity that enables an animal to survive the winter by reducing the demand for energy when food is unavailable
- ▶ a state of torpor that enables an animal to survive the summer by reducing the demand for energy
- ▶ the pressure that results from a difference in solute concentration between the two sides of a selectively permeable membrane (two words)
- ▶ the solution on one side of a permeable membrane that has the lower concentration of water
- ▶ the solution on one side of a permeable membrane that has the higher concentration of water
- ▶ two solutions that have equal water concentrations
- ▶ the process of actively regulating the osmotic pressure of bodily fluids and cells
- ▶ a structure in a single-celled organism that maintains osmotic equilibrium by pumping excess fluid out of the cell (two words)
- ▶ an excretory organ in some invertebrates, which is used to reabsorb and eliminate wastes
- ▶ the main organ of excretion in insects, which is used to carry wastes to the intestines (two words)
- ▶ the tiny functional unit of the kidney that filters wastes from the blood
- ▶ a small folded structure in the human kidney that encircles the glomerulus (two words)
- ▶ a network of capillaries within the Bowman's capsule that performs the first step in the filtration of blood
- ▶ a vessel that supplies blood to the nephrons in the human kidney (two words)
- ▶ a vessel that carries away filtered blood from the nephrons in the human kidney (two words)
- ▶ a net of capillaries in the nephrons that reabsorb essential ions and minerals from filtered blood (two words)
- ▶ the duct portion of a nephron that connects the Bowman's capsule to the loop of Henle (three words)
- ▶ the U-shaped part of the duct that connects the proximal convoluted tubule to the distal convoluted tubule (three words)
- ▶ the duct portion of a nephron that connects the loop of Henle to the ducts that lead to the renal pelvis (three words)
- ▶ the process in which blood and fluid pass through a selectively permeable membrane
- ▶ the transfer of water, ions, and nutrients back to the interstitial fluid via passive and active transport
- ▶ a membrane protein that passively transports water molecules
- ▶ the removal of waste materials from the blood and interstitial fluid

J	Q	O	E	M	M	K	P	F	Y	F	G	B	H	N	E	G	A	T	I	V	E	F	E	E	D	B	A	C	K	F	G
A	C	R	V	L	E	E	D	J	P	V	T	O	G	D	M	R	E	H	T	O	D	N	E	D	B	I	K	T	C	L	W
E	O	F	T	P	U	C	F	K	T	D	O	A	O	C	I	T	O	M	S	O	R	E	P	Y	H	N	P	H	O	C	O
J	U	N	O	J	I	B	V	F	T	M	T	X	D	I	I	Y	C	N	M	V	L	I	M	F	F	T	M	M	W	Z	O
J	R	Y	R	W	N	V	U	P	E	G	Q	F	M	B	N	X	W	O	E	X	K	F	G	M	C	E	E	H	Y	L	G
Y	A	K	P	T	T	Q	M	T	S	C	I	W	O	S	M	O	T	I	C	P	R	E	S	S	U	R	E	G	Q	N	K
M	X	J	O	S	E	Y	T	E	D	F	T	W	Y	T	Z	F	O	T	Y	Y	T	C	E	B	U	S	Q	U	N	P	F
X	C	L	R	I	G	T	N	N	W	E	N	O	C	C	O	B	R	A	F	I	S	S	Z	L	J	T	G	V	O	E	Q
P	I	A	R	S	R	F	L	W	E	J	T	N	R	Z	C	X	L	N	D	V	R	N	U	Y	C	I	I	D	I	R	Y
I	T	D	R	A	A	U	A	U	L	M	D	U	N	O	I	T	E	R	C	E	S	S	M	N	Q	T	O	V	T	I	S
N	O	N	F	T	T	X	O	G	U	L	N	Y	L	Y	U	L	Q	E	V	Z	E	S	K	K	W	I	I	V	A	T	W
X	M	O	H	S	O	L	V	Z	S	L	B	O	J	O	Z	C	F	B	F	V	I	R	M	Y	K	A	P	N	L	U	F
O	S	I	P	O	R	S	K	V	P	T	B	M	R	P	V	B	H	I	F	N	I	L	Z	T	Q	L	X	J	U	B	U
M	O	T	O	E	B	A	D	F	A	Z	N	R	O	I	F	N	M	H	A	D	A	P	P	K	R	F	P	Y	G	U	V
R	O	A	S	M	Z	D	Q	R	C	R	U	N	Y	U	V	O	O	H	I	F	X	V	U	J	Q	L	T	S	E	L	R
E	P	V	I	O	U	V	G	E	S	R	A	F	E	D	M	N	C	C	I	L	L	W	V	I	D	U	Z	V	R	A	A
H	Y	I	T	H	E	B	H	A	N	O	X	O	Y	X	F	E	E	L	L	T	P	O	F	I	S	I	S	J	O	R	F
T	H	T	I	F	A	Y	V	B	A	P	K	N	N	W	M	P	T	L	R	A	C	F	S	S	P	D	M	Z	M	C	F
O	R	S	V	A	L	Q	V	S	M	Q	I	V	O	C	X	R	E	M	A	N	M	T	H	I	D	V	U	K	R	A	E
E	J	E	E	B	P	R	Y	O	W	R	K	G	I	T	A	L	D	D	Q	N	A	I	E	B	V	U	I	S	E	P	R
M	Z	D	F	G	X	J	I	R	O	B	P	T	Q	T	U	Q	S	X	L	L	R	O	X	P	V	K	D	E	H	I	E
O	G	Q	E	B	M	Y	G	P	B	Y	A	R	I	B	V	Q	F	B	C	B	W	E	L	O	R	F	I	T	T	L	N
H	W	W	E	A	M	X	A	T	G	T	U	O	U	C	T	S	T	O	K	F	K	Z	T	W	R	J	R	P	M	L	T
M	J	K	D	V	P	U	E	I	S	F	N	T	M	C	S	R	N	C	C	M	C	Y	W	N	R	P	H	O	Y	A	A
B	U	L	B	E	Q	R	A	O	Z	L	N	Z	O	F	U	V	W	O	J	B	V	S	S	O	I	B	P	I	X	R	R
N	B	D	A	A	D	F	E	N	D	A	P	N	X	M	O	E	C	T	O	T	H	E	R	M	Z	B	E	N	G	I	T
K	K	Z	C	F	C	M	J	L	I	O	H	E	W	L	D	Y	W	H	U	Q	S	N	Y	A	A	S	N	T	K	E	E
W	Y	H	K	G	O	X	C	H	I	E	X	S	U	M	M	N	F	L	K	Z	K	K	B	H	E	V	A	Z	J	S	R
L	H	P	Z	H	G	C	G	K	S	L	D	T	E	W	U	X	Z	O	T	J	T	F	A	S	E	A	T	W	P	T	I
C	Z	F	F	M	Z	I	I	A	I	B	E	F	F	E	R	E	N	T	A	R	T	E	R	I	O	L	E	O	N	A	O
T	O	H	O	I	P	L	I	T	U	D	Q	J	V	A	E	L	N	E	H	F	O	P	O	O	L	V	M	F	X	N	L
E	U	T	T	L	O	K	M	K	T	L	C	I	T	O	M	S	O	O	S	I	Q	N	W	A	J	F	A	Y	V	M	E
Q	O	L	A	T	K	H	M	U	F	I	U	R	E	H	L	X	Z	L	T	H	S	H	V	E	E	J	R	Y	R	O	H
S	O	M	H	E	B	B	B	X	B	W	K	U	A	C	O	N	T	R	A	C	T	I	L	E	V	A	C	U	O	L	E
P	P	E	N	P	I	U	J	R	T	J	J	N	E	P	H	R	O	N	X	E	X	K	W	T	J	M	H	J	S	D	W
R	R	G	J	Q	L	A	L	G	T	V	F	O	E	W	F	Z	A	R	V	O	B	D	A	A	N	S	T	N	N	X	J
M	O	Y	S	E	T	H	E	R	M	A	L	A	C	C	L	I	M	A	T	I	Z	A	T	I	O	N	T	M	E	G	H
S	J	Y	A	I	T	R	Q	Z	Q	E	J	R	U	J	N	L	T	B	B	Q	L	I	R	L	M	T	B	G	S	D	W
A	P	Q	K	J	C	D	Z	N	O	I	T	A	L	U	G	E	R	O	M	S	O	Y	T	X	J	J	N	A	F	V	Y
Y	R	X	Q	E	Q	E	V	K	H	G	X	O	W	R	E	K	F	O	M	I	F	L	M	V	C	S	E	J	J	H	X



Chapter 10

The Endocrine System

- ▶ a hormone composed of chains of amino acids that is water soluble; usually acts on cell membrane receptors (two words)
- ▶ a hormone composed of cholesterol that is not very water soluble; usually passes through the cell membrane and acts on receptors inside the cell (two words)
- ▶ the region of the brain that releases hormones to control the pituitary gland, which, in turn, controls other endocrine glands
- ▶ a hormone produced by neurons, such as in the hypothalamus, which controls the production of other hormones in the pituitary gland
- ▶ a two-lobed gland within the cranial cavity, which produces hormones that control the other endocrine glands (two words)
- ▶ an endocrine gland located in the throat that is regulated by the hypothalamus-pituitary system (two words)
- ▶ a hormone secreted by the parathyroid glands that controls calcium and phosphate levels in the blood (two words)
- ▶ an endocrine gland located in or on the brain of vertebrates, which secretes the hormone melatonin to regulate biological rhythms (two words)
- ▶ endocrine cell clusters inside the pancreas that produce insulin and glucagon (three words)
- ▶ a hormone produced by alpha cells in the pancreas that raises the blood glucose level by promoting the breakdown of glycogen in the liver
- ▶ predominantly female sex hormones, including estradiol, which trigger sexual development
- ▶ predominantly female sex hormones, including progesterone, which control the menstrual cycle
- ▶ a hormone created by humans that behaves like a natural hormone (two words)
- ▶ glands responsible for the production of sex hormones, as well as the egg and sperm cells; called testes in males and ovaries in females
- ▶ predominantly male sex hormones, including testosterone, which control sexual development and reproduction
- ▶ a hormone released by the hypothalamus that controls the release of LH and FSH from the anterior pituitary, which, in turn, control the synthesis and release of the male or female hormones in the gonads (two words)
- ▶ the production of eggs, or ova, from oocytes in the ovaries by two meiotic divisions
- ▶ the end of a female's reproductive capability, after which menstruation ceases and female hormone levels drop
- ▶ the monthly cycle of events in a sexually mature female, which prepares the uterus for the implantation of a fertilized egg (two words)
- ▶ the main male sex hormone, which stimulates and controls the development of male secondary sexual characteristics
- ▶ the production and development of sperm cells in the testes

B	F	B	O	U	L	Z	Q	B	P	T	U	P	B	E	W	V	I	O	G	G	E	D	N	U	N	P	E
S	M	G	E	N	O	M	R	O	H	C	I	T	E	H	T	N	Y	S	Z	N	K	I	Q	J	A	A	N
D	Q	K	E	O	B	M	I	Y	K	S	R	N	O	S	D	G	E	P	O	Y	W	K	F	P	Z	R	O
A	Z	G	W	F	K	R	W	L	W	F	P	H	W	X	E	W	H	M	S	E	Y	Y	C	P	A	A	M
N	B	C	C	B	D	H	S	Y	W	P	B	K	L	I	M	E	R	Z	V	I	E	Z	V	J	K	T	R
O	L	U	I	R	B	M	N	Q	L	U	E	R	K	T	I	O	F	C	O	B	N	C	D	S	F	H	O
G	W	Q	Q	B	V	C	E	Y	N	B	Z	K	W	R	H	N	C	Q	O	C	O	J	V	K	Q	Y	H
P	L	I	I	J	A	E	G	L	O	Q	O	U	Z	N	F	R	I	R	K	B	M	Q	T	S	L	R	O
R	F	I	C	S	B	H	O	P	Y	N	F	U	I	L	Y	D	Z	Y	Z	Z	R	I	H	U	L	O	R
O	K	O	M	Z	D	A	R	H	A	I	S	E	W	V	D	G	I	I	Z	Q	O	K	D	D	C	I	U
G	T	A	P	A	T	P	T	T	E	I	T	K	Y	Y	E	H	Q	J	N	B	H	P	V	J	N	D	E
E	X	D	Z	J	H	M	S	X	T	O	R	A	N	O	R	Y	O	T	V	K	G	L	Z	O	P	H	N
S	A	L	Z	P	W	U	E	D	R	L	J	F	U	B	V	S	D	C	B	L	N	S	X	I	Q	O	B
T	B	U	J	W	C	O	Q	P	A	F	O	O	G	E	N	E	S	I	S	Q	I	Q	N	C	H	R	P
I	P	O	Q	V	E	V	R	Z	E	H	G	U	U	D	M	B	P	F	A	T	S	E	N	X	L	M	Q
N	S	N	A	H	R	E	G	N	A	L	F	O	S	T	E	L	S	I	O	D	A	N	I	K	U	O	D
S	P	N	W	Y	V	P	I	T	U	I	T	A	R	Y	G	L	A	N	D	L	E	W	X	Q	T	N	K
E	U	Q	D	S	Q	J	N	B	B	E	J	B	J	T	R	Y	P	S	G	J	L	W	S	R	A	E	Z
W	F	O	E	F	I	M	K	W	Z	Z	U	V	F	W	W	S	J	L	Y	F	E	J	C	L	D	E	D
Z	W	K	W	S	O	S	W	I	U	Q	L	S	R	K	N	F	A	U	L	O	R	J	G	N	N	R	H
P	Q	Y	T	H	L	A	E	W	C	I	G	O	S	E	Y	N	H	N	Z	W	N	D	L	O	G	S	I
C	H	A	Y	S	Y	X	I	N	L	P	D	M	G	M	D	N	Y	L	J	M	I	G	M	A	N	M	N
Z	E	I	V	B	G	O	M	T	E	S	T	O	S	T	E	R	O	N	E	O	P	R	H	P	J	T	O
U	Y	X	C	I	N	Z	U	E	G	G	R	B	U	F	T	N	N	O	R	R	O	A	Q	W	V	G	G
Z	J	N	E	Y	L	N	R	D	D	D	O	P	F	H	W	S	S	Y	T	H	R	B	S	J	X	H	A
R	J	T	N	V	N	Q	C	H	N	H	K	T	I	M	L	L	H	T	D	Z	T	E	K	J	T	S	C
P	Z	C	F	K	K	D	R	A	H	F	L	F	A	I	U	T	R	I	R	O	O	D	C	J	N	F	U
B	U	R	B	S	P	B	Q	N	O	J	D	Q	J	M	P	B	O	I	Y	U	D	B	W	L	G	W	L
D	N	R	J	P	S	G	O	Q	A	V	G	U	C	S	R	R	Y	B	W	Y	A	H	G	W	W	X	G
A	X	X	J	U	D	N	U	K	W	A	L	K	F	O	E	E	L	B	T	P	N	L	K	D	R	G	Q
V	H	Y	P	O	T	H	A	L	A	M	U	S	G	T	K	G	P	C	F	V	O	L	C	T	H	Y	A
Z	E	R	I	V	E	I	O	R	Y	S	C	Z	S	R	R	Q	V	S	P	I	G	V	A	Y	C	K	F
K	X	R	V	D	T	B	U	I	K	V	A	H	C	N	Y	Q	H	R	U	Q	R	D	I	Q	C	V	N
B	X	Y	F	E	N	F	N	Q	Q	V	Q	U	U	Z	R	Y	L	Z	Q	L	W	V	S	Z	M	L	Y
Z	C	B	K	M	O	G	N	X	N	A	C	R	Y	D	V	G	E	S	U	A	P	O	N	E	M	O	E



Chapter 11

The Nervous System

- ▶ a nerve cell that is capable of conducting nerve impulses
- ▶ the reception, transmission, and integration of nerve impulses by neurons, and the response to these impulses (two words)
- ▶ a neuron that carries impulses from sensory receptors to the central nervous system; also called a sensory neuron (two words)
- ▶ a local circuit neuron of the central nervous system that relays impulses between afferent (sensory) neurons and efferent (motor) neurons
- ▶ a neuron that carries impulses from the central nervous system to skeletal muscles; also known as a motor neuron (two words)
- ▶ a projection of cytosol that carries signals toward the nerve cell body
- ▶ an extension of cytosol that carries nerve signals away from the nerve cell body
- ▶ a non-conducting cell that is important for the structural support and metabolism of nerve cells (two words)
- ▶ an insulated covering over the axon of a nerve cell (two words)
- ▶ a regularly occurring gap between sections of myelin sheath along the axon (three words)
- ▶ the body's coordinating centre for mechanical and chemical actions; made up of the brain and spinal cord (three words)
- ▶ all parts of the nervous system, excluding the brain and spinal cord; relays information between the central nervous system and other parts of the body (three words)
- ▶ the component of the peripheral nervous system that receives input through receptors and transmits the input to the central nervous system (two words)
- ▶ the component of the peripheral nervous system that carries signals away to the effectors (muscles and glands) (two words)
- ▶ a subdivision of the efferent system; composed of efferent (motor) neurons that carry signals to skeletal muscles in response to external stimuli (two words)
- ▶ a subdivision of the efferent system; regulates the internal environment (two words)
- ▶ one of two subdivisions of the autonomic nervous system; increases energy consumption and prepares the body for action (two words)
- ▶ one of two subdivisions of the autonomic nervous system; stimulates body actions that acquire and conserve energy (two words)
- ▶ the coordination of the receptor, afferent neuron, interneuron, efferent neuron, and effector in response to a stimulus (two words)
- ▶ a neural circuit that travels through the spinal cord but does not require the coordination of the brain; allows for reflex actions (two words)
- ▶ a functional connection between neurons or between neurons and effectors
- ▶ a synapse in which a neurotransmitter moves from a presynaptic cell to a postsynaptic cell through the synaptic cleft (two words)
- ▶ a chemical that is released from vesicles into synapses to facilitate nerve signal transmission
- ▶ the tiny gap between presynaptic and postsynaptic cells in a chemical synapse, across which the neurotransmitter diffuses (two words)
- ▶ a synapse in which the presynaptic cell makes direct contact with the postsynaptic cell, allowing current to flow via gap junctions between the cells (two words)
- ▶ the electrical potential of a membrane, which is caused by an imbalance in charges on either side of the membrane (two words)
- ▶ a protein embedded in the plasma membrane that allows ions to pass through it (two words)
- ▶ the voltage difference across a nerve cell membrane of an unstimulated neuron; usually negative (two words)
- ▶ the voltage difference across a nerve cell membrane when the nerve is excited (two words)
- ▶ the potential at which an action potential is generated by a neuron (two words)
- ▶ the period of time during which the threshold required for the generation of an action potential is much higher than normal (two words)
- ▶ three layers of connective tissue that surround and protect the brain and spinal cord
- ▶ circulating fluid that surrounds the membranes of the brain and spinal cord; provides neural connection to the endocrine system (two words)
- ▶ the tissue of the brain and spinal cord, where the cell bodies and dendrites of neurons are located (two words)
- ▶ the tissue of the brain and spinal cord, composed primarily of axons of neurons; in the spinal cord, it surrounds the grey matter (two words)
- ▶ the hindbrain region that connects the spinal cord to the cerebellum; important in autonomic nerve control (two words)
- ▶ the hindbrain region that is involved in muscle movement and balance
- ▶ the brain region that transfers nerve signals between the cerebellum and the medulla
- ▶ the brain region that is involved in motor activities and sensory information; the largest and most developed region of the brain
- ▶ the outermost layer of the cerebral hemispheres (two words)
- ▶ the brain region that interprets sensory input and signals the cerebrum
- ▶ a barrier formed by tight junctions between endothelial cells in the capillaries in the brain, which blocks the movement of most substances into the brain via the bloodstream (two words)
- ▶ the 31 pairs of nerves within the somatic system that transmit motor, sensory, and autonomic signals between the spinal cord and the rest of the body (two words)
- ▶ the 12 pairs of nerves within the parasympathetic division of the autonomic system, which emerge directly from the brain and serve the head, neck, and body trunk (two words)
- ▶ the tendency for some sensory receptors to become less sensitive when stimulated repeatedly (two words)
- ▶ a negative feedback mechanism that attempts to maintain blood pressure (two words)

Z	S	N	E	U	R	O	T	R	A	N	S	M	I	T	T	E	R	Q	A	M	S	S	S	I	A	S	H	M	L	H	Q	F
T	K	B	U	Q	K	C	X	G	C	E	R	E	B	R	A	L	C	O	R	T	E	X	K	Y	S	G	G	C	V	P	V	J
G	B	W	V	B	W	M	E	T	S	Y	S	S	U	O	V	R	E	N	L	A	R	T	N	E	C	U	G	T	R	Y	L	U
P	L	T	X	D	Q	R	V	F	H	K	F	U	I	M	H	U	Y	D	K	X	C	O	L	I	P	I	H	D	H	A	A	E
R	E	T	T	A	M	Y	E	R	G	S	U	Q	H	R	I	M	H	R	I	Q	M	T	O	X	Q	G	I	U	F	W	I	K
W	X	R	E	R	R	E	P	A	V	H	F	R	D	U	M	T	G	S	U	M	A	L	A	H	T	Q	X	L	U	H	T	Q
J	N	E	I	V	I	H	M	Q	B	P	Z	M	E	M	B	R	A	N	E	P	O	T	E	N	T	I	A	L	L	T	N	A
K	E	W	R	P	I	E	U	U	N	O	R	U	E	N	P	E	U	B	R	O	D	Z	U	M	F	Y	G	E	L	A	E	B
G	U	J	A	K	H	D	P	C	V	R	N	O	R	U	E	N	T	N	E	R	E	F	F	A	H	I	U	L	E	P	T	N
G	R	H	Z	A	I	E	B	L	M	Y	E	L	I	N	S	H	E	A	T	H	V	G	S	Q	V	K	A	Z	C	E	O	I
G	A	N	C	B	S	T	R	I	L	Y	K	Z	L	Z	X	C	E	R	E	B	R	U	M	U	O	U	N	J	L	N	P	A
L	L	S	I	N	G	Y	H	A	O	O	S	E	N	S	O	R	Y	A	D	A	P	T	A	T	I	O	N	X	A	O	N	U
T	S	G	N	Y	U	W	M	R	L	N	J	J	S	P	S	E	V	R	E	N	L	A	I	N	A	R	C	X	I	R	O	U
X	I	P	T	Q	O	B	M	P	E	N	C	Y	F	R	E	S	T	I	N	G	P	O	T	E	N	T	I	A	L	E	I	W
F	G	A	E	R	V	O	S	T	A	S	E	H	T	O	G	D	K	A	R	B	K	Q	D	W	E	D	B	H	G	T	T	V
W	N	O	R	N	C	O	C	E	K	T	H	R	A	O	D	Y	P	C	O	O	N	N	G	H	I	P	X	P	H	S	C	O
J	A	R	N	J	K	H	V	E	V	B	H	O	V	N	I	Y	C	H	M	V	L	I	M	I	F	S	M	F	W	O	A	J
R	L	E	E	U	N	O	E	Z	G	R	L	E	L	O	N	W	T	E	X	K	F	G	M	T	C	V	H	Y	L	D	Y	A
K	L	I	U	L	M	O	S	M	I	W	E	O	T	D	U	E	G	M	U	S	V	F	G	E	N	G	Q	N	K	L	X	J
G	I	V	R	T	E	C	I	X	I	Y	T	N	O	I	P	S	L	T	C	E	B	C	T	M	U	Z	H	F	X	A	C	I
B	N	N	O	U	W	C	N	S	C	C	O	B	L	D	C	O	S	S	Z	K	J	A	G	A	K	U	Q	P	W	N	E	Q
V	G	A	N	K	J	N	T	N	I	C	A	L	D	A	B	D	T	Y	Y	C	Z	I	D	T	E	Y	I	D	D	I	R	Q
U	A	R	Z	U	D	G	R	R	J	V	G	L	N	D	N	R	I	E	S	C	O	V	M	T	C	N	Q	Q	F	S	E	X
S	G	F	L	E	Y	S	Y	U	I	Q	I	V	S	E	E	I	A	V	N	T	V	G	Y	E	R	M	Q	A	F	N	B	V
O	N	O	B	B	J	E	Z	C	D	C	F	D	D	Y	U	N	P	I	I	T	E	P	F	R	A	E	B	T	R	E	E	V
M	T	E	M	U	P	F	F	H	A	O	A	I	C	Z	N	R	D	S	N	S	I	M	L	W	X	N	M	A	A	T	L	V
A	N	D	O	F	F	L	M	F	Y	F	I	L	P	I	R	A	A	R	T	B	I	A	B	D	E	I	E	G	Q	O	L	R
T	N	O	U	V	O	T	Z	N	E	X	F	R	S	Q	T	T	P	L	I	R	A	O	L	T	L	N	T	N	A	I	U	A
I	E	N	M	N	F	Q	O	L	L	R	V	E	E	Y	Z	E	C	S	C	T	H	R	N	B	F	G	S	O	C	G	M	O
C	X	F	L	O	J	X	T	P	O	F	E	S	R	P	N	S	H	V	E	I	E	J	R	A	E	E	Y	L	P	N	C	N
S	N	P	G	E	A	V	C	F	P	S	P	N	O	E	Y	A	D	T	R	T	R	A	L	I	R	S	S	B	E	A	O	G
Y	G	O	M	C	N	E	Q	H	I	D	V	V	T	S	N	R	P	J	A	U	B	C	R	Y	E	M	T	O	G	N	T	K
S	D	D	Q	J	R	P	E	B	V	U	E	N	Z	N	G	T	O	S	S	P	X	J	U	R	S	R	N	A	Q	I	J	Q
T	X	L	G	Q	O	H	P	V	K	W	S	G	R	O	E	G	S	T	E	Y	M	G	Q	I	Y	V	E	L	B	N	Q	F
E	O	B	W	U	L	M	R	F	D	R	M	A	Y	G	W	U	D	Y	C	X	N	Y	G	V	T	O	R	L	T	E	T	R
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M	C	Y	O	F	R	E	T	O	Y	R	A	B	U	L	I	E	V	O	A	T	R	L	P	A	O	F	F	D	W	O	J	B
V	S	S	O	N	B	Y	J	X	A	N	N	B	D	N	K	D	F	P	N	D	E	F	N	S	R	E	F	E	R	W	Q	E
R	T	P	Z	B	S	A	G	N	F	K	K	Z	F	F	C	B	J	L	J	C	H	M	E	E	E	A	E	M	U	Q	S	N
Y	A	A	S	F	C	C	E	R	E	B	R	O	S	P	I	N	A	L	F	L	U	I	D	R	N	F	P	K	Z	K	K	B
H	E	V	P	Z	J	M	E	T	S	Y	S	C	I	M	O	N	O	T	U	A	E	W	U	X	Z	O	T	J	T	F	A	S
E	A	Q	W	P	T	I	C	Z	F	F	M	Z	G	P	A	I	S	Y	N	A	P	T	I	C	C	L	E	F	T	F	H	C



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Unit 4

Homeostasis

- ▶ the physiological state of the body in which internal physical and chemical conditions are kept within a range that is suitable for life processes
- ▶ the extracellular fluid, which consists of the fluid that surrounds the cells and tissues in the body and the plasma portion of the blood (two words)
- ▶ the fluid that surrounds the body cells (two words)
- ▶ a system that monitors internal and external conditions and changes bodily functions to maintain homeostasis (two words)
- ▶ the response of a system that acts to maintain equilibrium by compensating for any changes made to the system (two words)
- ▶ the element of a feedback system that detects changes in the environment
- ▶ the element of a feedback system that compares existing conditions with ideal conditions
- ▶ the optimal value for a given variable of a system (two words)
- ▶ the element (or elements) of a feedback system that act to return the system to its optimal state
- ▶ the response of a system that acts to increase the effect of any changes made to the system (two words)
- ▶ the regulation of internal temperature by negative feedback mechanisms
- ▶ an animal that maintains a stable body temperature regardless of the temperature of the external environment
- ▶ an animal whose body temperature varies with, and often matches, the temperature of the external environment
- ▶ an animal that maintains its body temperature by internal mechanisms
- ▶ an animal that maintains its body temperature by absorbing thermal energy from the environment
- ▶ the process by which an animal gradually adjusts to temperature changes in its environment (two words)
- ▶ a short-term state of reduced metabolic rate and body temperature that reduces the demand for energy during the night or day
- ▶ a state of greatly reduced metabolic rate and activity that enables an animal to survive the winter by reducing the demand for energy when food is unavailable
- ▶ a state of torpor that enables an animal to survive the summer by reducing the demand for energy
- ▶ the pressure that results from a difference in solute concentration between the two sides of a selectively permeable membrane (two words)
- ▶ the solution on one side of a permeable membrane that has the lower concentration of water
- ▶ the solution on one side of a permeable membrane that has the higher concentration of water
- ▶ two solutions that have equal water concentrations
- ▶ the process of actively regulating the osmotic pressure of bodily fluids and cells
- ▶ a structure in a single-celled organism that maintains osmotic equilibrium by pumping excess fluid out of the cell (two words)
- ▶ an excretory organ in some invertebrates, which is used to reabsorb and eliminate wastes
- ▶ the main organ of excretion in insects, which is used to carry wastes to the intestines (two words)
- ▶ the tiny functional unit of the kidney that filters wastes from the blood
- ▶ a small folded structure in the human kidney that encircles the glomerulus (two words)
- ▶ a network of capillaries within the Bowman's capsule that performs the first step in the filtration of blood
- ▶ a vessel that supplies blood to the nephrons in the human kidney (two words)
- ▶ a vessel that carries away filtered blood from the nephrons in the human kidney (two words)
- ▶ a net of capillaries in the nephrons that reabsorb essential ions and minerals from filtered blood (two words)
- ▶ the duct portion of a nephron that connects the Bowman's capsule to the loop of Henle (three words)
- ▶ the U-shaped part of the duct that connects the proximal convoluted tubule to the distal convoluted tubule (three words)
- ▶ the duct portion of a nephron that connects the loop of Henle to the ducts that lead to the renal pelvis (three words)
- ▶ the process in which blood and fluid pass through a selectively permeable membrane
- ▶ the transfer of water, ions, and nutrients back to the interstitial fluid via passive and active transport
- ▶ a membrane protein that passively transports water molecules
- ▶ the removal of waste materials from the blood and interstitial fluid
- ▶ a hormone composed of chains of amino acids that is water soluble; usually acts on cell membrane receptors (two words)
- ▶ a hormone composed of cholesterol that is not very water soluble; usually passes through the cell membrane and acts on receptors inside the cell (two words)
- ▶ the region of the brain that releases hormones to control the pituitary gland, which, in turn, controls other endocrine glands
- ▶ a hormone produced by neurons, such as in the hypothalamus, which controls the production of other hormones in the pituitary gland
- ▶ a two-lobed gland within the cranial cavity, which produces hormones that control the other endocrine glands (two words)
- ▶ an endocrine gland located in the throat that is regulated by the hypothalamus-pituitary system (two words)
- ▶ a hormone secreted by the parathyroid glands that controls calcium and phosphate levels in the blood (two words)
- ▶ an endocrine gland located in or on the brain of vertebrates, which secretes the hormone melatonin to regulate biological rhythms (two words)
- ▶ endocrine cell clusters inside the pancreas that produce insulin and glucagon (three words)
- ▶ a hormone produced by alpha cells in the pancreas that raises the blood glucose level by promoting the breakdown of glycogen in the liver
- ▶ predominantly female sex hormones, including estradiol, which trigger sexual development
- ▶ predominantly female sex hormones, including progesterone, which control the menstrual cycle
- ▶ a hormone created by humans that behaves like a natural hormone (two words)
- ▶ glands responsible for the production of sex hormones, as well as the egg and sperm cells; called testes in males and ovaries in females
- ▶ predominantly male sex hormones, including testosterone, which control sexual development and reproduction
- ▶ a hormone released by the hypothalamus that controls the release of LH and FSH from the anterior pituitary, which, in turn, control the synthesis and release of the male or female hormones in the gonads (two words)
- ▶ the production of eggs, or ova, from oocytes in the ovaries by two meiotic divisions
- ▶ the end of a female's reproductive capability, after which menstruation ceases and female hormone levels drop
- ▶ the monthly cycle of events in a sexually mature female, which prepares the uterus for the implantation of a fertilized egg (two words)
- ▶ the main male sex hormone, which stimulates and controls the development of male secondary sexual characteristics
- ▶ the production and development of sperm cells in the testes
- ▶ a nerve cell that is capable of conducting nerve impulses
- ▶ the reception, transmission, and integration of nerve impulses by neurons, and the response to these impulses (two words)
- ▶ a neuron that carries impulses from sensory receptors to the central nervous system; also called a sensory neuron (two words)
- ▶ a local circuit neuron of the central nervous system that relays impulses between afferent (sensory) neurons and efferent (motor) neurons
- ▶ a neuron that carries impulses from the central nervous system to skeletal muscles; also known as a motor neuron (two words)
- ▶ a projection of cytosol that carries signals toward the nerve cell body
- ▶ an extension of cytosol that carries nerve signals away from the nerve cell body
- ▶ a non-conducting cell that is important for the structural support and metabolism of nerve cells (two words)
- ▶ an insulated covering over the axon of a nerve cell (two words)
- ▶ a regularly occurring gap between sections of myelin sheath along the axon (three words)
- ▶ the body's coordinating centre for mechanical and chemical actions; made up of the brain and spinal cord (three words)
- ▶ all parts of the nervous system, excluding the brain and spinal cord; relays information between the central nervous system and other parts of the body (three words)
- ▶ the component of the peripheral nervous system that receives input through receptors and transmits the input to the central nervous system (two words)
- ▶ the component of the peripheral nervous system that carries signals away to the effectors (muscles and glands) (two words)
- ▶ a subdivision of the efferent system; composed of efferent (motor) neurons that carry signals to skeletal muscles in response to external stimuli (two words)
- ▶ a subdivision of the efferent system; regulates the internal environment (two words)
- ▶ one of two subdivisions of the autonomic nervous system; increases energy consumption and prepares the body for action (two words)
- ▶ one of two subdivisions of the autonomic nervous system; stimulates body actions that acquire and conserve energy (two words)
- ▶ the coordination of the receptor, afferent neuron, interneuron, efferent neuron, and effector in response to a stimulus (two words)
- ▶ a neural circuit that travels through the spinal cord but does not require the coordination of the brain; allows for reflex actions (two words)
- ▶ a functional connection between neurons or between neurons and effectors
- ▶ a synapse in which a neurotransmitter moves from a presynaptic cell to a postsynaptic cell through the synaptic cleft (two words)
- ▶ a chemical that is released from vesicles into synapses to facilitate nerve signal transmission
- ▶ the tiny gap between presynaptic and postsynaptic cells in a chemical synapse, across which the neurotransmitter diffuses (two words)
- ▶ a synapse in which the presynaptic cell makes direct contact with the postsynaptic cell, allowing current to flow via gap junctions between the cells (two words)
- ▶ the electrical potential of a membrane, which is caused by an imbalance in charges on either side of the membrane (two words)
- ▶ a protein embedded in the plasma membrane that allows ions to pass through it (two words)
- ▶ the voltage difference across a nerve cell membrane of an unstimulated neuron; usually negative (two words)
- ▶ the voltage difference across a nerve cell membrane when the nerve is excited (two words)
- ▶ the potential at which an action potential is generated by a neuron (two words)
- ▶ the period of time during which the threshold required for the generation of an action potential is much higher than normal (two words)
- ▶ three layers of connective tissue that surround and protect the brain and spinal cord
- ▶ circulating fluid that surrounds the membranes of the brain and spinal cord; provides neural connection to the endocrine system (two words)
- ▶ the tissue of the brain and spinal cord, where the cell bodies and dendrites of neurons are located (two words)
- ▶ the tissue of the brain and spinal cord, composed primarily of axons of neurons; in the spinal cord, it surrounds the grey matter (two words)
- ▶ the hindbrain region that connects the spinal cord to the cerebellum; important in autonomic nerve control (two words)
- ▶ the hindbrain region that is involved in muscle movement and balance
- ▶ the brain region that transfers nerve signals between the cerebellum and the medulla
- ▶ the brain region that is involved in motor activities and sensory information; the largest and most developed region of the brain
- ▶ the outermost layer of the cerebral hemispheres (two words)
- ▶ the brain region that interprets sensory input and signals the cerebrum
- ▶ a barrier formed by tight junctions between endothelial cells in the capillaries in the brain, which blocks the movement of most substances into the brain via the bloodstream (two words)
- ▶ the 31 pairs of nerves within the somatic system that transmit motor, sensory, and autonomic signals between the spinal cord and the rest of the body (two words)
- ▶ the 12 pairs of nerves within the parasympathetic division of the autonomic system, which emerge directly from the brain and serve the head, neck, and body trunk (two words)
- ▶ the tendency for some sensory receptors to become less sensitive when stimulated repeatedly (two words)
- ▶ a negative feedback mechanism that attempts to maintain blood pressure (two words)

M K W O C U E S M P L M J A N E U R A L C I R C U I T S U Q Q I H Z Y Y Y H S S Q T T T F N Y E W I
I S X M A B C F L H W J D M C U B R T R N N Q R Y D E L C Y C L A U R T S N E M B C M G E S H T G H
I Y C E N U A D A I P U G S N T Q R D F H I E P Q N I V X N P G A Z O G D S W Z F V Z L H D G C C V
A L R V D S S I I K H Z M B N M I B Y N Z Y H U C S W S V D A Y R Y D V L O R L B G U L S L U Z M K
B Y A W R F I R T K G H Z V O E E O B S A R H U R C Y B T X F Z Q Z L E V N C R A B I B Z O L S I K
U V X L O T D R N H U P W W J T L S N D I L M M O A J C O A G M F T A C D E L X U V Y R Q G E X M S
J O E O G H P A E Z A F K I A S O U E P R S G E Y O L N P E L D T M E T S Y S T N E R E F F A P Y X
W T L K E R X N T V P W B G M Y U L N Y O X A L F J X S E P A C I D M B K K D Q M Z M X U J Q N T O
T U F I N E Y Z O C C M L H T S C U O A O T H T A L Y M I W B A O E U F F E S F O D F J R U A H I X
L Q E T S S K A P H K K T X T T A R M W M E E Y S E J A S G T G G N O I T A N R E B I H V P T M B W
S A R A W H C O E T S C N P Q N V E R H E V N N Q O N E I S N O P U V U C O J U H B T B T V G E E K
I I Y M C O A S N X P A E B A E E M O T N P D D T H E I V G V A P O L O N A G M Y O R I M L V T N B
O C X V E L B M A K Y B M H V R L O H A Z E T E O I X M P Z P Y L O C C L O P X R R C I J X R S O T
N M X C R D D O R X A D N B P E I L D P J R R T T T A X O O N N V L E O P U I Y S C Y G O W W Y M Y
C W H F E P E T B V L E O C H F T G I E U I F P K P H L L H D N O R I N E Z T T L J R I T O H S R T
H W N E B O E I M L A E R Y Z F C S O N P T O K P J Q E R I O G E C Y N I Y N E A D P J T X I C O E
A E E S O R T F C E W I F I P S E A G R O M U O H A R W L R C B B Q S Q K G M F F D R M G W C T I H F
N H U U O E E P M S T E V M G M R R E R E B O P T Y H M Q L M R I R G W T D T J M I T T D S U E T O F
N Q R A S N V R F D N V N W W A T O T E N U G M E W B A W U N J Z O S T G W C E R I U L A I M A R E
E T O P P T I E C L E I E Z H L N P S T I L J D A F M G M T M N H N A L F B N T H R N B I P A M U C
L I N O I I T S M D T T L M H P O R T S N A F E Q I P T E F V G Q A Y R I W F S W K P G U F T O E T
I S B N N A I S Y D O A A D U I C O M O G R S N X U N G G D C G O D P G G B Q Y J B V H U L T S N O
Y I H E A L S U B C P G N M I G V T E D E C Q O W K R Z H X Q T M O D D M F M S P E Q W P K E A K R
Y P H M L E O R A G G E R A N H P S N L S A R F R A T F B H Z R P T E D C B Y S R Y X G W X R O V V
Q J E T F L P E T H N N E R X I P S U A A P G G T E U S R Y A S F R N C J S K U O Z C R O H N U U K
S T M C L M B B L N I Z T Z X A B O H N F I S O Y E G N M P S Y R O O J Q Z I O T A Q U A P O R I N
I E A Z U M S S N H T E N Z N N D A I I F L R X H P R M B O N E N P R M A O S V E N V K E R X P C P
N I G G I G B I O I S C I Y I T W I A S E L Q V L K K Y I T A X Y I E J F F U R I B T V H N O K F S
O B T Y D I C E I S E W L I U E G U N R A Y L S W T E D H H W K N T F F N M E N K B E U O L T H
D R E P W U L Y S D R L W M B F J L E E R A W E J R L Q A H R R K R S H E O A N H Y R G K I B H E O
E W E Q Y R P M I U A S P S P U F D C T N I Q M N E G I B L E E C E O H R I L L O X H M J T U O S M
O U W Y B L O J V C U R G E E L N T M O T E W D S L D N P A G F B L T Q E T A A R R N U W E N X P E
F N Y Q C A Y T I P V O A V M E O L F I N S C Z O O M S E M N R W E S L N A H R M A P I L R C A A O
R S B T H J K R D X K P U R W Z I Y B G E W F L R I L H Q U A A Z A E W T L T T O R H D E C M R N S
A A B J X A T E C C G L T E I K T T B N U U S Y F R B E U S L C C S T B A U J N N N A I M E R W Y T
N A L P K C M I I A I V O N B B A N M A R I R F F E O A Z T F T T I K E R G A E E O Y R E S X N S A
V C S U E T D M T J S I N L J W V O E N O U B S J T W T C E O O G N Y H T E K C L R C H D S V B I T
I I J L X Y U T E V J V O A X A I I T I N E J F P R M H L F S R Q G R J E R X U X U I P U H R T Y I
E U E Y W H G J H U P X M N S U T S S N V D P L Q A A P V L T Y R H C G R O X N S E T E L G E R T C
R T W H W N N R T Y I D I I U B S I Y E L T N S T T N C S X E P W O N W I M J O A N O N L A C O E M
U G Y P B G L Z A X R Q C P Z D E V S R K R T H N S S G T L E L R L Y O R C Z N R M A A L T L Q E
K L C I J W L O P R E R S S Z H O I S N F O F K I E C F R Y S R F M H X L E I F E E S T O O O N X C
H Y V T O S E W M N A N Y M F K Q D U B P W S R O R A W E K I I V O R L E H T E O T O E B O T T A H
M L J U K E C V Y O B Y S G T F T C O L E C E S P E P M Y J R O A N O E Y T O A L N O M L P H X W A
Q O U I Q N L G S G S F T K E T S I V O X E V Y T F S N M Y I D P E J K R I M R T I P S O O E P D N
N E N T R S A H A A O K E N S F N T R O L R R N E F U F A Y H W J A N X X Z S Y Y W Y A N F R B T I
N X G A I O I V U C R M M A H Z O E E D P E E T S E L A T I U A K S R A T Y O V A I H B G H M H S
J I R R S R L B K U P M S C Q J I H N B D B N H N F E G T B A S D I O A R X O U O L G K A E H H Y M
P C L Y C Y G A N L T X Z E E Y T T L R J R L E W F T J E D C A L H S V T S S E Z F K E T N P S R O
C S L G W A S L U G I H O R G N A A A A Z A A T S E H H R D N R E J C F P H I L U H S J A L H X O O
C V J L M D N K I O O O T E T O L P R I E L I I Y R Q B E O H R H D B Y J F Y V V Q S F D E U D I P
O R X A I A I Y Z S N L D B X R U M E N Y C N C A E I U G C R E T T I M S N A R T O R U E N M W D J
B Y C N P P T D E N O K N E W H G Y H B Z O A H U N L Y X U N I C V J P P G Y A O T B O Q Y O X G Z
P S T D V T S M D Q C Z T L L P E S P A G R R O R T T H E R M A L A C C L I M A T I Z A T I O N L U
I W D O Z A E F N R R V Q L M E R A I R K T C R R N H D G M Z D P Y R P D A S D X D D Z H F M G A O
E M E O W T G Q Q S E E Y U S N O R R R O E K M I E L O D Q S N E G O R T S E T C I B H K P X M N Q
H T N G T I O V A H F V O M Q X M A E I U X W O O U G K H Z X V J Y G D I M I W O Q T G O C W K D L
K K D E W O R F V G M W I I U C S P P E T R O N G R R S Z F Q Z W W I L N J Q T I J I U G R K L N G
I U R N D N P R F T M I H Z Z O O U X R X F D E H O M E O T H E R M X P O I K I L O T H E R M D B Y
K J I E P J S K Y K E S P A N Y S L A C I M E H C N W J T U N X A Q Z G W I P Q G B R H I J C O K Z
L X T S I S E N E G O T A M R E P S R Y U I N T E R S T I T I A L F L U I D K O K D R H T O S S N Z
C T E I Z P U C L D M E K V E O Y O O W N N U T I M U B X R K F O M J A U L E A T V Q W W Z D A Y E
Y R O S U E N W S L K I O T D H O D H Y P E R O S M O T I C O T W O S P B T K X H T W O D I M M D E



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Chapter 12

Natural Population Dynamics

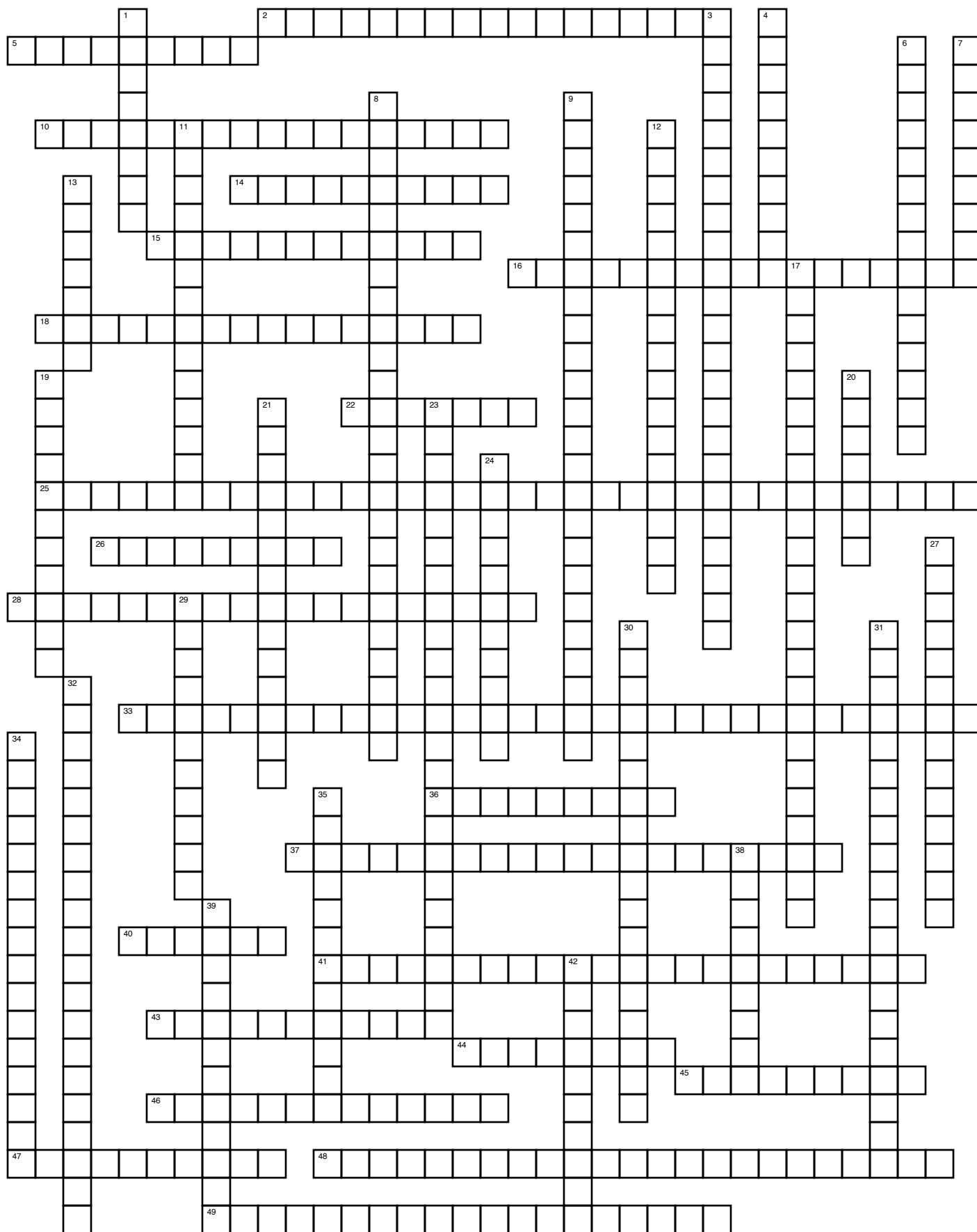
Across

2. a graphic display of the rate of survival of individuals over the lifespan of a species (two words)
5. an interaction in which both partners benefit
10. population density measured in terms of the number of organisms of the same species per unit area or volume that is actually used by the individuals (two words)
14. the study of the growth rate, age structure, and other characteristics of populations
15. population density measured in terms of the number of organisms of the same species within the total area of the habitat (two words)
16. the number of individuals of the same species that occurs per unit area or volume (two words)
18. the number of individuals in a population that the environmental resources can support (two words)
22. a form of defence in which one species evolves an appearance that resembles the appearance of another species
25. a pattern of population growth in which organisms reproduce continuously at a constant rate (five words)
26. the potential for a species to reproduce offspring in a lifetime
28. the difference between the per capita birth rate and the per capita death rate of a population (four words)
33. a model that describes limited population growth, often due to limited resources or predation (five words)
36. the death rate of a population
37. the proportion of individuals that were alive at the start of an age interval but died during the age interval (two words)
40. a group of individuals of similar ages
41. a factor that is influenced by population density, having a greater impact as the population density increases (two words)

43. a process in which one species evolves in response to the evolution of another species
44. the relative proportion of males and females in a population (two words)
45. the interaction between predator and prey
46. the range of conditions and resources that a population actually uses in nature (two words)
47. the movement of individuals out of a population
48. the proportion of individuals that were alive at the start of an age interval and survived until the start of the next age interval (two words)
49. a sampling technique for estimating population size and density by comparing the proportion of marked and unmarked animals that are captured in a given area; sometimes called capture-recapture method (two words)

Down

1. the birth rate of a population
3. competition in which all the individuals have equal access to resources; some have superior ability to gather resources (two words)
4. the pattern of distribution in which a population exists; may be clumped, random, or uniform
6. the overall spatial boundaries within which a population lives (two words)
7. the interaction between herbivorous animals and the plants that they eat
8. competition between members of the same population for resources (two words)
9. competition between members of different species (two words)
11. the average time between the birth of an organism and the birth of its offspring (two words)
12. a sub-field of ecology that focuses on the dynamics of population and how populations interact with their environment (two words)
13. the place where an organism normally lives
17. a factor that influences population regulation, regardless of population density (two words)
19. a density-dependent phenomenon that occurs when a population cannot survive or fails to reproduce enough to offset mortality once the population density is too low (two words)
20. a sampling frame that is used for estimating population size; the frame can be real or virtual
21. a factor that limits the growth of a population (two words)
23. competition in which all the individuals have equal access to resources; the fitness of some individuals is reduced by the presence of others (two words)
24. an interaction in which both competing populations lose access to some resources
27. the number of individuals of a specific species that occupies a given area/volume at a given time (two words)
29. the movement of individuals into a population
30. the change in a population over time (two words)
31. a situation in which the death rate and the birth rate are in equilibrium (three words)
32. a situation in which several species that live in the same place use different resources or use the same resources in different ways (two words)
34. the range of conditions and resources that a population can possibly tolerate and use (two words)
35. an S-shaped curve, typical of population growth that starts slow, accelerates or grows rapidly, and then levels out over time (two words)
38. a chart that summarizes the demographic characteristics of a population (two words)
39. an interaction in which one species benefits and the other is unaffected
42. an interaction in which one species benefits and the other is harmed





Chapter 13

Human Population Dynamics

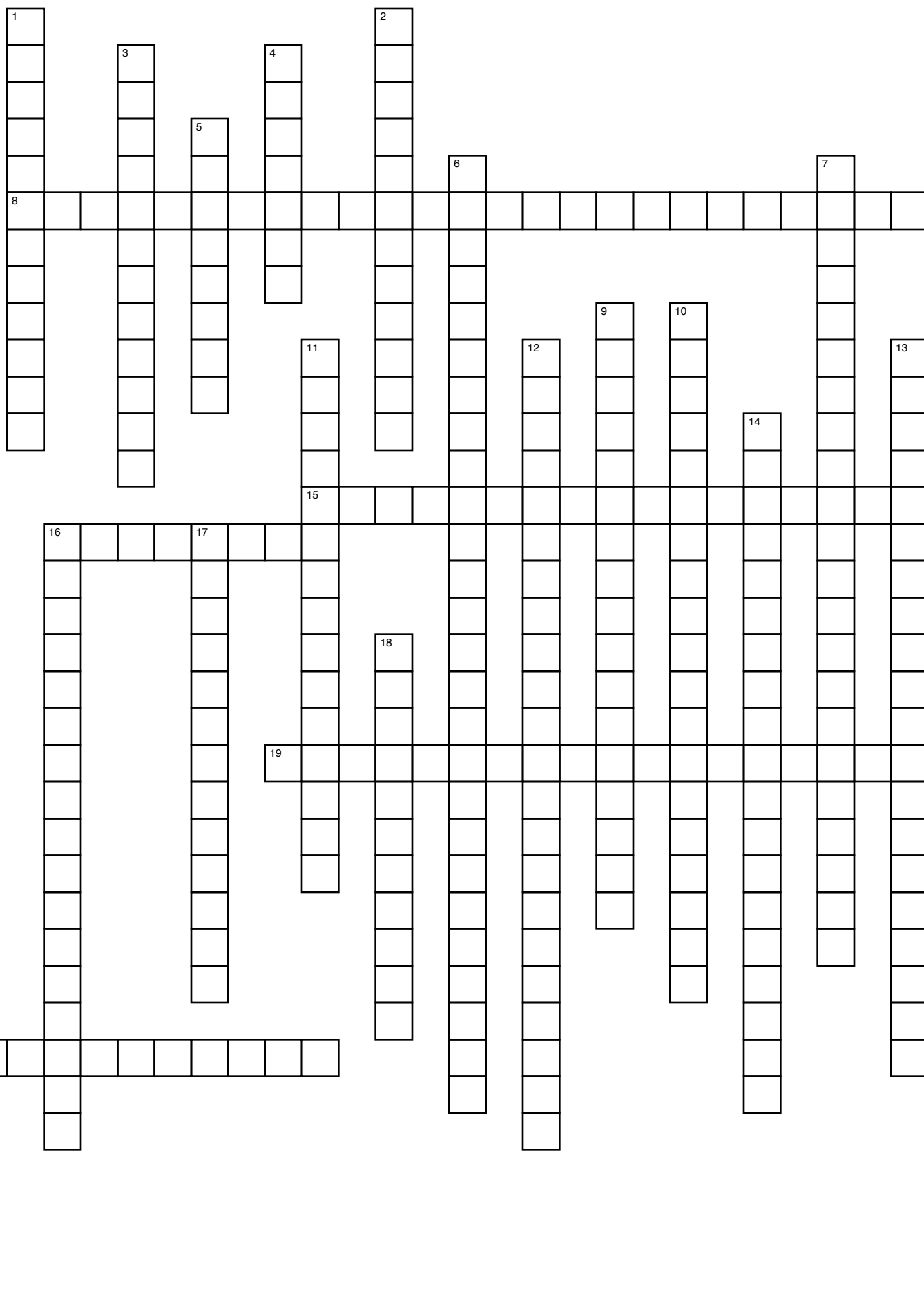
Across

8. the growth of food using machines and synthetic fertilizers and pesticides (two words)
15. descendants of First Nation, Métis, or Inuit people (two words)
16. the spread of a disease beyond a very local population
19. a method of growing food without using synthetic fertilizers and pesticides (two words)
20. a measure of an ecosystem's ability to produce useful biological materials and to absorb waste materials created by humans

Down

1. one level of a food web (two words)
2. the addition of salty products due to the overuse of resources
3. a condition that develops when the body lacks proper nutrients
4. an injection of a dead or inactivated virus to spur an immune response
5. a disease-causing agent, such as a microbe or fungus
6. a diagram that illustrates changes in how people live to explain shifts in population sizes (three words)
7. the growth of food using less energy and fewer resources than industrialized agriculture uses (two words)
9. a tool that shows the distribution of ages among males and female in a population (two words)
10. the growth of food using less energy and fewer resources than industrialized agriculture uses (two words)
11. the rate at which people have children to "replace" them when they die (two words)

12. the growth of food by hand, using natural fertilizers and pesticides (two words)
13. a period of great technological advancement from the 1800s to 1900s, during which machines were developed (two words)
14. the impact imposed on the environment by the demand for natural resources (two words)
16. resource use and waste production that exceeds a sustainable level (two words)
17. a tool used by researchers to track the usable energy in a food web (two words)
18. a method of raising fish and shellfish for crops
20. marine and aquatic species that are captured because of their proximity to targeted species





Unit 5 Population Dynamics

Across

1. an interaction in which both competing populations lose access to some resources
3. the proportion of individuals that were alive at the start of an age interval but died during the age interval (two words)
8. an interaction in which both partners benefit
10. the interaction between herbivorous animals and the plants that they eat
12. a method of growing food without using synthetic fertilizers and pesticides (two words)
16. the growth of food using less energy and fewer resources than industrialized agriculture uses (two words)
18. the death rate of a population
20. one level of a food web (two words)
21. marine and aquatic species that are captured because of their proximity to targeted species
24. the number of individuals in a population that the environmental resources can support (two words)
25. a factor that influences population regulation, regardless of population density (two words)
26. the overall spatial boundaries within which a population lives (two words)
29. a measure of an ecosystem's ability to produce useful biological materials and to absorb waste materials created by humans
30. an interaction in which one species benefits and the other is unaffected
33. the range of conditions and resources that a population actually uses in nature (two words)
36. a model that describes limited population growth, often due to limited resources or predation (five words)
37. the impact imposed on the environment by the demand for natural resources (two words)
40. a tool used by researchers to track the usable energy in a food web (two words)
42. the addition of salty products due to the overuse of resources
44. a sub-field of ecology that focuses on the dynamics of population and how populations interact with their environment (two words)
46. a pattern of population growth in which organisms reproduce continuously at a constant rate (five words)
49. a process in which one species evolves in response to the evolution of another species
53. the number of individuals of a specific species that occupies a given area/volume at a given time (two words)
54. the interaction between predator and prey
58. the pattern of distribution in which a population exists; may be clumped, random, or uniform
60. competition in which all the individuals have equal access to resources; some have superior ability to gather resources (two words)
61. the place where an organism normally lives
63. a chart that summarizes the demographic characteristics of a population (two words)
65. the birth rate of a population
66. a condition that develops when the body lacks proper nutrients
67. the relative proportion of males and females in a population (two words)
68. the potential for a species to reproduce offspring in a lifetime
69. competition in which all the individuals have equal access to resources; the fitness of some individuals is reduced by the presence of others (two words)
70. population density measured in terms of the number of organisms of the same species within the total area of the habitat (two words)
22. the smallest population size that is likely to survive both predictable and unpredictable environmental variation; note that it is only a prediction (four words)
23. a diagram that illustrates changes in how people live to explain shifts in population sizes (three words)
27. the movement of individuals out of a population
28. a situation in which several species that live in the same place use different resources or use the same resources in different ways (two words)
31. an injection of a dead or inactivated virus to spur an immune response
32. a factor that is influenced by population density, having a greater impact as the population density increases (two words)
34. resource use and waste production that exceeds a sustainable level (two words)
35. a group of individuals of similar ages
38. competition between members of different species (two words)
39. the growth of food by hand, using natural fertilizers and pesticides (two words)
41. the proportion of individuals that were alive at the start of an age interval and survived until the start of the next age interval (two words)
43. the movement of individuals into a population
45. the rate at which people have children to "replace" them when they die (two words)
47. a tool that shows the distribution of ages among males and female in a population (two words)
48. a period of great technological advancement from the 1800s to 1900s, during which machines were developed (two words)
50. the number of individuals of the same species that occurs per unit area or volume (two words)
51. a sampling technique for estimating population size and density by comparing the proportion of marked and unmarked animals that are captured in a given area; sometimes called capture-recapture method (two words)
52. the study of the growth rate, age structure, and other characteristics of populations
53. the change in a population over time (two words)
55. a factor that limits the growth of a population (two words)
56. the average time between the birth of an organism and the birth of its offspring (two words)
57. the spread of a disease beyond a very local population
59. an S-shaped curve, typical of population growth that starts slow, accelerates or grows rapidly, and then levels out over time (two words)
62. a method of raising fish and shellfish for crops
64. a disease-causing agent, such as a microbe or fungus

Down

2. an interaction in which one species benefits and the other is harmed
3. a density-dependent phenomenon that occurs when a population cannot survive or fails to reproduce enough to offset mortality once the population density is too low (two words)
4. a graphic display of the rate of survival of individuals over the lifespan of a species (two words)
5. the growth of food using less energy and fewer resources than industrialized agriculture uses (two words)
6. a sampling frame that is used for estimating population size; the frame can be real or virtual
7. population density measured in terms of the number of organisms of the same species per unit area or volume that is actually used by the individuals (two words)
9. the growth of food using machines and synthetic fertilizers and pesticides (two words)
11. a form of defence in which one species evolves an appearance that resembles the appearance of another species
13. descendants of First Nation, Métis, or Inuit people (two words)
14. competition between members of the same population for resources (two words)
15. the range of conditions and resources that a population can possibly tolerate and use (two words)
17. the difference between the per capita birth rate and the per capita death rate of a population (four words)
19. a situation in which the death rate and the birth rate are in equilibrium (three words)

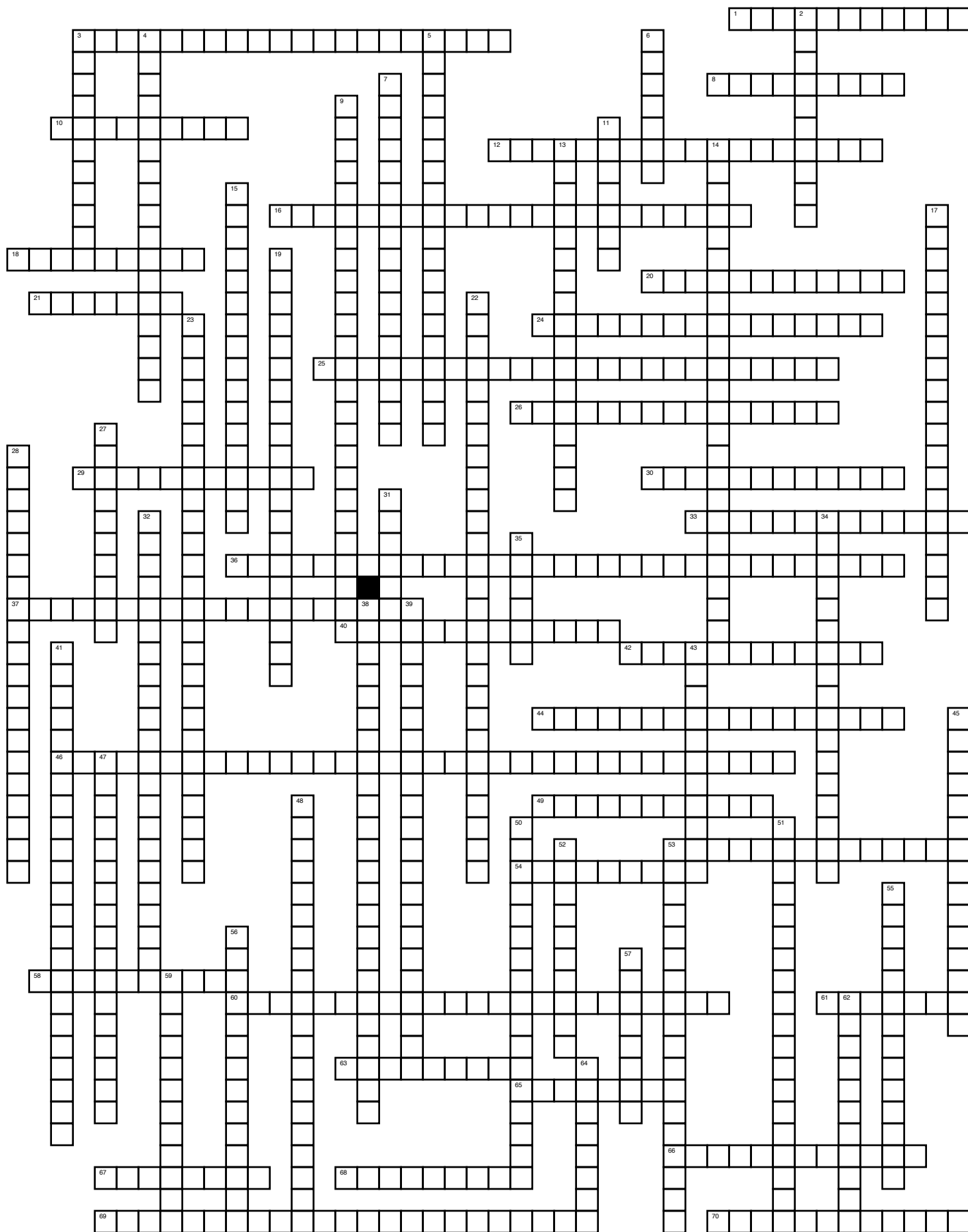




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Chapter 12

Natural Population Dynamics

- ▶ a sub-field of ecology that focuses on the dynamics of population and how populations interact with their environment (two words)
- ▶ the overall spatial boundaries within which a population lives (two words)
- ▶ the place where an organism normally lives
- ▶ the number of individuals of a specific species that occupies a given area/volume at a given time (two words)
- ▶ the number of individuals of the same species that occurs per unit area or volume (two words)
- ▶ population density measured in terms of the number of organisms of the same species within the total area of the habitat (two words)
- ▶ population density measured in terms of the number of organisms of the same species per unit area or volume that is actually used by the individuals (two words)
- ▶ the pattern of distribution in which a population exists; may be clumped, random, or uniform
- ▶ a sampling frame that is used for estimating population size; the frame can be real or virtual
- ▶ a sampling technique for estimating population size and density by comparing the proportion of marked and unmarked animals that are captured in a given area; sometimes called capture-recapture method (two words)
- ▶ the study of the growth rate, age structure, and other characteristics of populations
- ▶ the birth rate of a population
- ▶ the death rate of a population
- ▶ the movement of individuals into a population
- ▶ the movement of individuals out of a population
- ▶ a chart that summarizes the demographic characteristics of a population (two words)
- ▶ a group of individuals of similar ages
- ▶ the proportion of individuals that were alive at the start of an age interval but died during the age interval (two words)
- ▶ the proportion of individuals that were alive at the start of an age interval and survived until the start of the next age interval (two words)
- ▶ a graphic display of the rate of survival of individuals over the lifespan of a species (two words)
- ▶ the potential for a species to reproduce offspring in a lifetime
- ▶ the average time between the birth of an organism and the birth of its offspring (two words)
- ▶ the relative proportion of males and females in a population (two words)
- ▶ the change in a population over time (two words)
- ▶ a pattern of population growth in which organisms reproduce continuously at a constant rate (five words)
- ▶ the difference between the per capita birth rate and the per capita death rate of a population (four words)
- ▶ a situation in which the death rate and the birth rate are in equilibrium (three words)
- ▶ the number of individuals in a population that the environmental resources can support (two words)
- ▶ a model that describes limited population growth, often due to limited resources or predation (five words)
- ▶ an S-shaped curve, typical of population growth that starts slow, accelerates or grows rapidly, and then levels out over time (two words)
- ▶ a factor that limits the growth of a population (two words)
- ▶ a factor that is influenced by population density, having a greater impact as the population density increases (two words)
- ▶ a factor that influences population regulation, regardless of population density (two words)
- ▶ an interaction in which both competing populations lose access to some resources
- ▶ competition between members of the same population for resources (two words)
- ▶ competition between members of different species (two words)
- ▶ the interaction between predator and prey
- ▶ a density-dependent phenomenon that occurs when a population cannot survive or fails to reproduce enough to offset mortality once the population density is too low (two words)
- ▶ the smallest population size that is likely to survive both predictable and unpredictable environmental variation; note that it is only a prediction (four words)
- ▶ a process in which one species evolves in response to the evolution of another species
- ▶ the interaction between herbivorous animals and the plants that they eat
- ▶ an interaction in which both partners benefit
- ▶ an interaction in which one species benefits and the other is harmed
- ▶ an interaction in which one species benefits and the other is unaffected
- ▶ a form of defence in which one species evolves an appearance that resembles the appearance of another species
- ▶ competition in which all the individuals have equal access to resources; the fitness of some individuals is reduced by the presence of others (two words)
- ▶ competition in which all the individuals have equal access to resources; some have superior ability to gather resources (two words)
- ▶ the range of conditions and resources that a population can possibly tolerate and use (two words)
- ▶ the range of conditions and resources that a population actually uses in nature (two words)
- ▶ a situation in which several species that live in the same place use different resources or use the same resources in different ways (two words)

E	X	P	L	O	I	T	A	T	I	V	E	C	O	M	P	E	T	I	T	I	O	N	R	Y	N	T	D	A	Q	F	Y	Q	R	N
K	Q	Y	V	Q	P	O	P	U	L	A	T	I	O	N	E	C	O	L	O	G	Y	C	S	M	V	C	Y	B	U	M	S	A	O	I
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P	C	Z	R	Z	I	J	G	Y	O	E	E	G	P	Z	Y	Q	P	G	O	Z	A	G	J	L	D	L	G	B	E	E	T	I	D	U
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I	R	Z	N	N	O	X	I	Z	I	C	Z	N	M	Q	N	M	E	E	P	R	B	A	H	I	T	N	G	O	G	B	I	M	I	S
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Y	H	S	A	A	P	S	P	P	I	M	B	G	A	A	X	E	P	N	X	E	C	C	E	T	W	I	V	J	H	I	E	R	S	C
N	R	Y	L	L	U	A	E	J	D	P	U	T	L	V	K	L	T	Q	P	L	O	C	E	I	M	O	T	E	V	M	P	E	N	U
A	A	H	U	U	L	T	C	Q	C	E	L	I	I	P	Q	K	E	E	K	M	I	P	I	U	C	E	C	M	Z	I	S	C	E	R
M	T	P	P	P	A	T	R	Q	U	T	H	U	T	W	C	Z	N	D	M	F	M	W	M	F	Z	R	E	N	D	M	R	A	D	V
I	E	V	O	O	T	N	U	X	R	I	I	D	Y	F	I	D	I	E	I	O	B	V	K	V	I	F	F	V	Q	G	E	P	Y	E
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Z	X	Y	D	Z	O	J	O	O	A	C	C	S	I	U	C	P	A	S	J	K	E	A	U	E	A	O	L	H	O	O	R	E	K	E
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E	C	O	M	I	T	X	U	O	V	M	O	L	O	P	I	J	C	M	E	C	H	L	J	I	Z	B	K	K	I	Y	J	H	N	P
B	M	V	L	U	H	P	R	V	T	R	I	I	U	O	B	V	S	R	V	S	I	W	C	M	I	V	H	V	B	L	U	O	M	I
Z	Q	I	A	M	O	Y	L	R	S	S	T	L	N	E	I	I	A	R	E	Z	T	A	P	T	Q	P	W	H	B	M	H	D	Q	U
X	I	B	I	P	K	V	F	H	M	A	A	D	R	L	T	T	W	N	E	L	L	S	A	W	V	Y	K	O	U	J	U	A	W	P
V	Q	R	T	M	P	Y	I	K	D	T	E	J	B	I	I	Q	S	D	X	D	N	T	V	L	J	F	E	C	U	N	D	I	T	Y
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J	W	Y	P	D	I	Y	G	I	P	M	A	L	E	I	T	O	U	A	A	Y	W	Y	V	C	Z	U	S	Z	Z	T	C	G	A	S
X	A	Z	X	Z	C	N	L	X	E	T	U	Q	U	Y	L	I	M	I	T	I	N	G	F	A	C	T	O	R	T	N	A	I	E	T
Q	Z	T	E	W	K	N	E	Y	A	A	L	H	Q	R	R	Y	T	I	L	A	T	A	N	C	T	T	Q	P	K	W	W	Y	X	U



Chapter 13

Human Population Dynamics

- ▶ the impact imposed on the environment by the demand for natural resources (two words)
- ▶ a disease-causing agent, such as a microbe or fungus
- ▶ the spread of a disease beyond a very local population
- ▶ a period of great technological advancement from the 1800s to 1900s, during which machines were developed (two words)
- ▶ an injection of a dead or inactivated virus to spur an immune response
- ▶ a tool that shows the distribution of ages among males and female in a population (two words)
- ▶ descendants of First Nation, Métis, or Inuit people (two words)
- ▶ a diagram that illustrates changes in how people live to explain shifts in population sizes (three words)
- ▶ the rate at which people have children to “replace” them when they die (two words)
- ▶ a condition that develops when the body lacks proper nutrients
- ▶ the growth of food using machines and synthetic fertilizers and pesticides (two words)
- ▶ the growth of food by hand, using natural fertilizers and pesticides (two words)
- ▶ a tool used by researchers to track the usable energy in a food web (two words)
- ▶ one level of a food web (two words)
- ▶ the addition of salty products due to the overuse of resources
- ▶ the growth of food using less energy and fewer resources than industrialized agriculture uses (two words)
- ▶ the growth of food using less energy and fewer resources than industrialized agriculture uses (two words)
- ▶ a method of growing food without using synthetic fertilizers and pesticides (two words)
- ▶ marine and aquatic species that are captured because of their proximity to targeted species
- ▶ a method of raising fish and shellfish for crops
- ▶ resource use and waste production that exceeds a sustainable level (two words)
- ▶ a measure of an ecosystem’s ability to produce useful biological materials and to absorb waste materials created by humans

P	E	J	U	G	N	T	I	C	I	F	E	D	L	A	C	I	G	O	L	O	C	E	R	C	T	F	L
B	I	H	I	V	F	F	Y	P	H	H	P	T	H	J	J	W	M	W	Y	H	K	T	S	K	F	Q	O
Y	M	H	A	D	Y	L	K	I	O	D	N	B	T	H	D	A	B	J	T	D	W	R	D	I	G	Q	W
O	T	R	V	D	M	S	E	E	S	Z	S	F	R	U	H	N	N	N	K	N	X	A	I	N	K	M	I
H	H	H	V	U	G	J	Y	P	O	Z	A	F	R	M	L	M	I	K	O	R	E	D	M	F	G	X	N
G	S	E	L	Q	P	T	A	I	U	O	V	N	M	Q	Y	R	A	I	X	E	R	I	A	F	D	C	P
J	W	V	C	E	L	T	I	D	D	P	G	U	F	I	P	V	T	H	G	P	U	T	R	I	W	Y	U
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Q	S	V	S	U	R	I	S	C	S	L	P	Q	W	K	X	K	N	T	Z	N	G	G	A	O	B	T	U
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F	J	L	S	O	K	G	P	I	K	Z	Y	V	R	N	Z	D	I	Z	P	R	D	I	U	T	J	C	T
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Y	J	C	R	U	B	O	N	B	N	Y	T	K	V	D	R	F	P	Q	N	W	L	T	J	U	H	C	M
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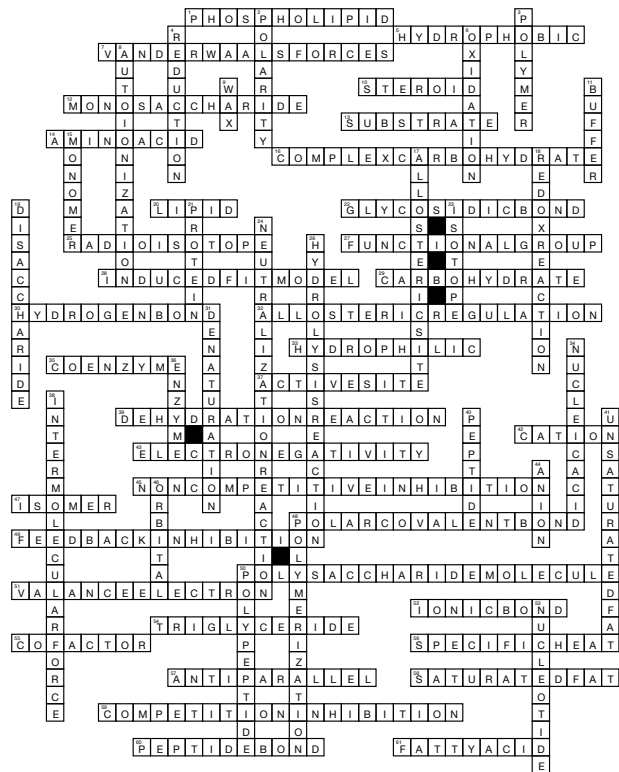


Unit 5 Population Dynamics

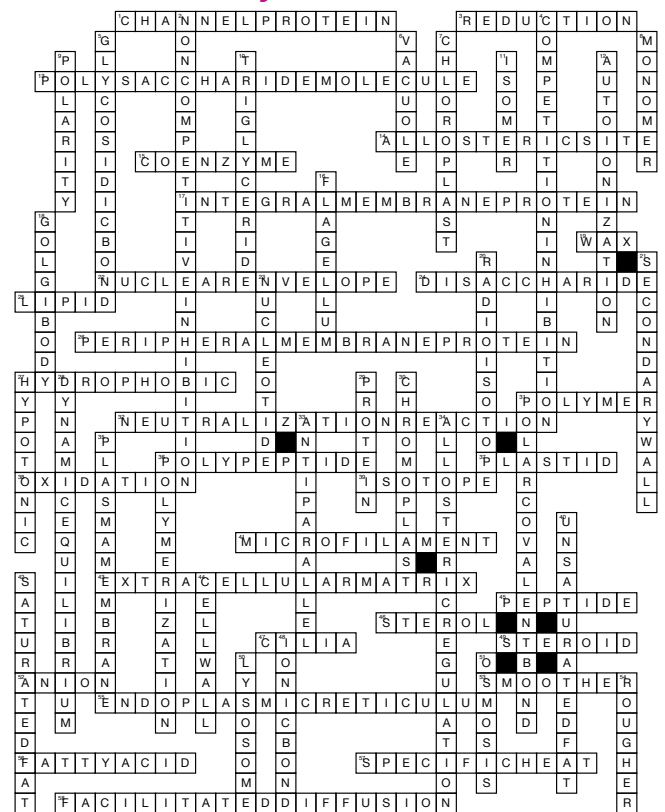
- ▶ a sub-field of ecology that focuses on the dynamics of population and how populations interact with their environment (two words)
- ▶ the overall spatial boundaries within which a population lives (two words)
- ▶ the place where an organism normally lives
- ▶ the number of individuals of a specific species that occupies a given area/volume at a given time (two words)
- ▶ the number of individuals of the same species that occurs per unit area or volume (two words)
- ▶ population density measured in terms of the number of organisms of the same species within the total area of the habitat (two words)
- ▶ population density measured in terms of the number of organisms of the same species per unit area or volume that is actually used by the individuals (two words)
- ▶ the pattern of distribution in which a population exists; may be clumped, random, or uniform
- ▶ a sampling frame that is used for estimating population size; the frame can be real or virtual
- ▶ a sampling technique for estimating population size and density by comparing the proportion of marked and unmarked animals that are captured in a given area; sometimes called capture-recapture method (two words)
- ▶ the study of the growth rate, age structure, and other characteristics of populations
- ▶ the birth rate of a population
- ▶ the death rate of a population
- ▶ the movement of individuals into a population
- ▶ the movement of individuals out of a population
- ▶ a chart that summarizes the demographic characteristics of a population (two words)
- ▶ a group of individuals of similar ages
- ▶ the proportion of individuals that were alive at the start of an age interval but died during the age interval (two words)
- ▶ the proportion of individuals that were alive at the start of an age interval and survived until the start of the next age interval (two words)
- ▶ a graphic display of the rate of survival of individuals over the lifespan of a species (two words)
- ▶ the potential for a species to reproduce offspring in a lifetime
- ▶ the average time between the birth of an organism and the birth of its offspring (two words)
- ▶ the relative proportion of males and females in a population (two words)
- ▶ the change in a population over time (two words)
- ▶ a pattern of population growth in which organisms reproduce continuously at a constant rate (five words)
- ▶ the difference between the per capita birth rate and the per capita death rate of a population (four words)
- ▶ a situation in which the death rate and the birth rate are in equilibrium (three words)
- ▶ the number of individuals in a population that the environmental resources can support (two words)
- ▶ a model that describes limited population growth, often due to limited resources or predation (five words)
- ▶ an S-shaped curve, typical of population growth that starts slow, accelerates or grows rapidly, and then levels out over time (two words)
- ▶ a factor that limits the growth of a population (two words)
- ▶ a factor that is influenced by population density, having a greater impact as the population density increases (two words)
- ▶ a factor that influences population regulation, regardless of population density (two words)
- ▶ an interaction in which both competing populations lose access to some resources
- ▶ competition between members of the same population for resources (two words)
- ▶ competition between members of different species (two words)
- ▶ the interaction between predator and prey
- ▶ a density-dependent phenomenon that occurs when a population cannot survive or fails to reproduce enough to offset mortality once the population density is too low (two words)
- ▶ the smallest population size that is likely to survive both predictable and unpredictable environmental variation; note that it is only a prediction (four words)
- ▶ a process in which one species evolves in response to the evolution of another species
- ▶ the interaction between herbivorous animals and the plants that they eat
- ▶ an interaction in which both partners benefit
- ▶ an interaction in which one species benefits and the other is harmed
- ▶ an interaction in which one species benefits and the other is unaffected
- ▶ a form of defence in which one species evolves an appearance that resembles the appearance of another species
- ▶ competition in which all the individuals have equal access to resources; the fitness of some individuals is reduced by the presence of others (two words)
- ▶ competition in which all the individuals have equal access to resources; some have superior ability to gather resources (two words)
- ▶ the range of conditions and resources that a population can possibly tolerate and use (two words)
- ▶ the range of conditions and resources that a population actually uses in nature (two words)
- ▶ a situation in which several species that live in the same place use different resources or use the same resources in different ways (two words)
- ▶ the impact imposed on the environment by the demand for natural resources (two words)
- ▶ a disease-causing agent, such as a microbe or fungus
- ▶ the spread of a disease beyond a very local population
- ▶ a period of great technological advancement from the 1800s to 1900s, during which machines were developed (two words)
- ▶ an injection of a dead or inactivated virus to spur an immune response
- ▶ a tool that shows the distribution of ages among males and female in a population (two words)
- ▶ descendants of First Nation, Métis, or Inuit people (two words)
- ▶ a diagram that illustrates changes in how people live to explain shifts in population sizes (three words)
- ▶ the rate at which people have children to “replace” them when they die (two words)
- ▶ a condition that develops when the body lacks proper nutrients
- ▶ the growth of food using machines and synthetic fertilizers and pesticides (two words)
- ▶ the growth of food by hand, using natural fertilizers and pesticides (two words)
- ▶ a tool used by researchers to track the usable energy in a food web (two words)
- ▶ one level of a food web (two words)
- ▶ the addition of salty products due to the overuse of resources
- ▶ the growth of food using less energy and fewer resources than industrialized agriculture uses (two words)
- ▶ the growth of food using less energy and fewer resources than industrialized agriculture uses (two words)
- ▶ a method of growing food without using synthetic fertilizers and pesticides (two words)
- ▶ marine and aquatic species that are captured because of their proximity to targeted species
- ▶ a method of raising fish and shellfish for crops
- ▶ resource use and waste production that exceeds a sustainable level (two words)
- ▶ a measure of an ecosystem's ability to produce useful biological materials and to absorb waste materials created by humans

Z T V A C C I N E P A T P Q Y W F U X N L M S I L A S N E M M O C I H U H W F Q E A C U
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 C B U G Y U B R E P L A C E M E N T R A T E K R T H F V W E I G T S E N E Y B V B Z B G
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 D Q X Z T M L F T Q U N G T F H D T O T O I I O B Q C F G O O C P A O L I D M L A U S S
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 T P U C L D M O I N E L Y O U W N N T T R E N B G R V D A M O P U E E A T N P W I G I U
 A L Y R O V L Z N W O L M P O T D Y O A Y I S N M R G Y C I C E O D W O S A I T C E T T
 T R O H O C A E G C A I O O A R U I S N C G I V U Z I T G P E C P N J G A R T Y M S I L
 I A Z H B T A Q I S U P T M D P F I H A K N W C H G E I N Y C I S I Z Y S T A F O P R U
 V G V C I E J S K H O S R I T E T E G O O X D M T D L S I Z Q F U Y M T N C G P R E T C
 E Z A O S C A K B R X N R O T I L R C I A I L F H Q B N Y B U I R T W I Q I R O T C U A
 C H N S C T Y S E L C U E F S E I O T U O I L T T D A E R D J C V I U C Y H O P A I N U
 O I Q C I I I Z J G F O T M B C P I F M N S E X O H T D R H V C I S U A T P W U L F L Q
 M R Y E M N Q U A D R A T A U P T M G P T D O Z D C E D A K G O V N U P I A T L I I A A
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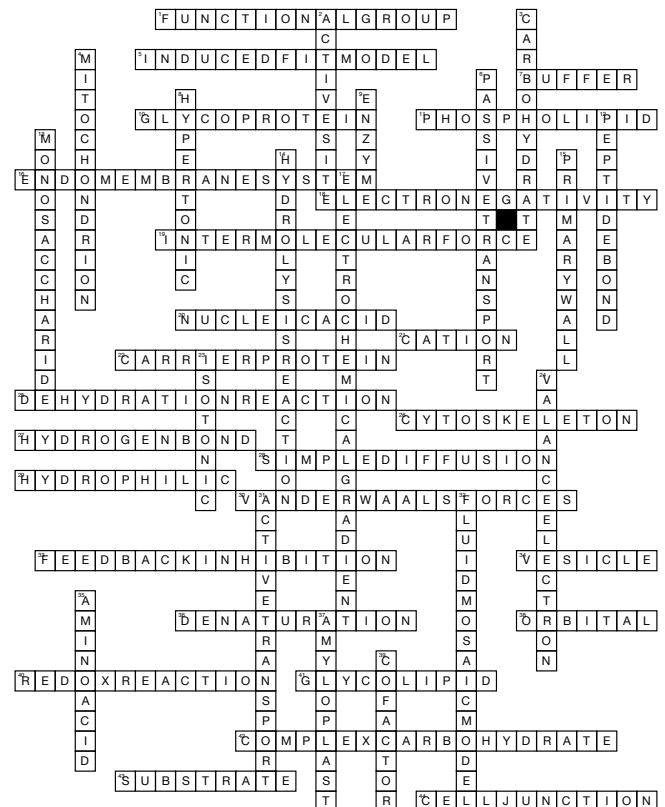
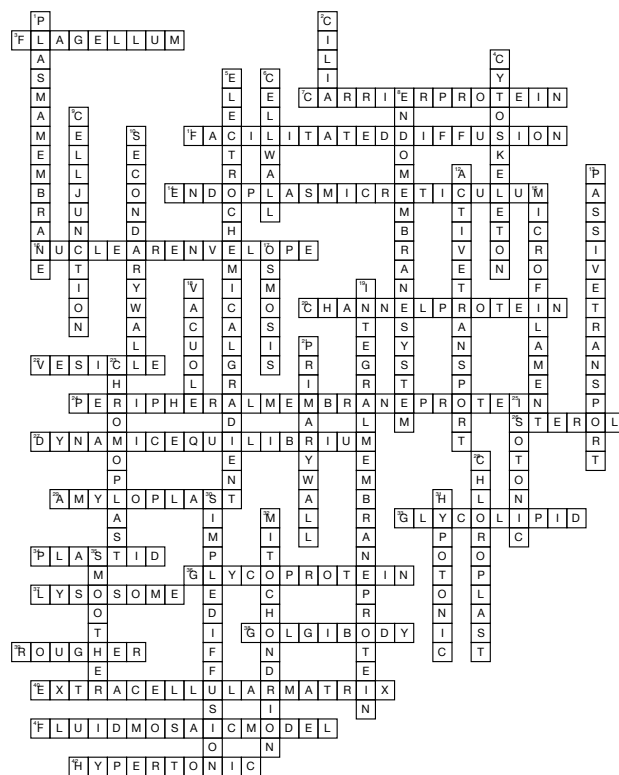
The Biochemical Basis of Life



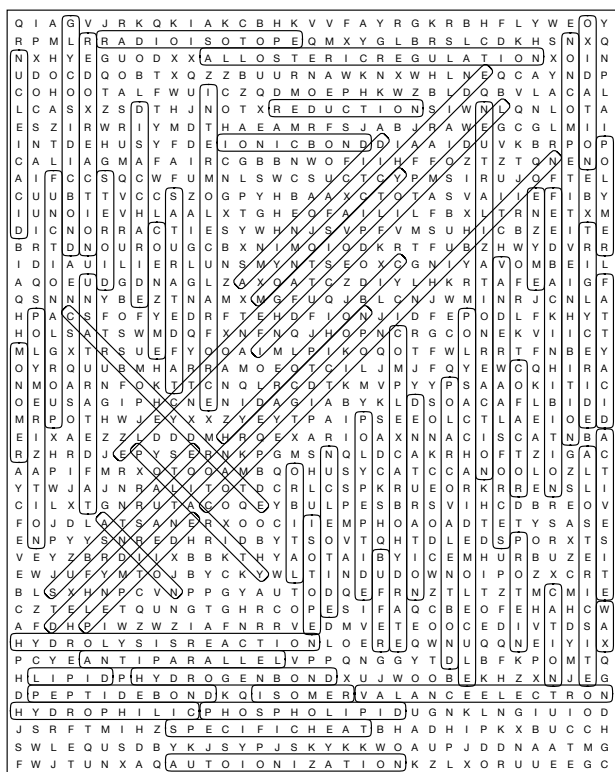
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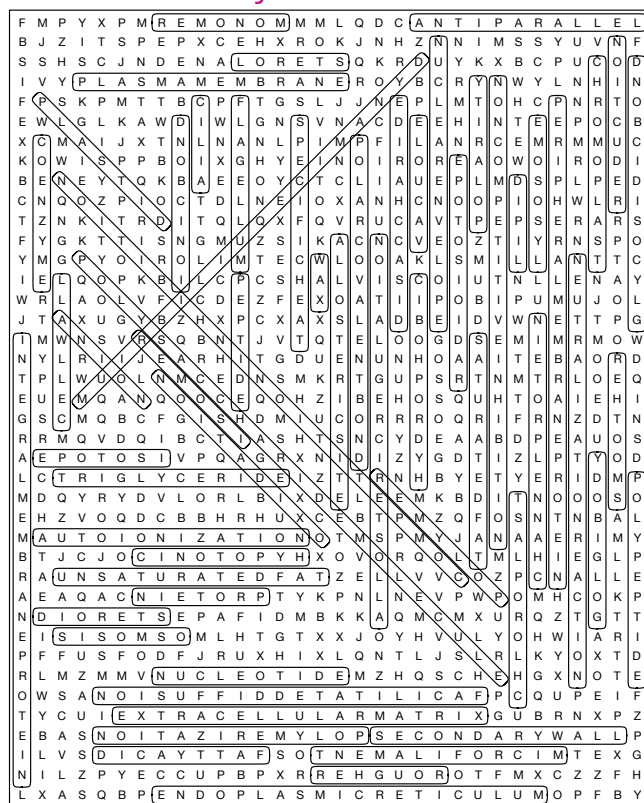
Cell Structure and Function



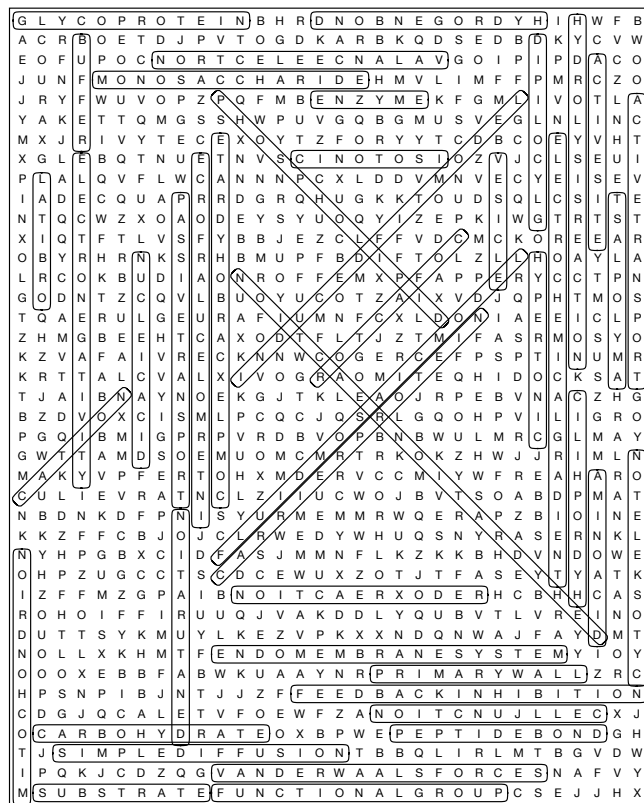
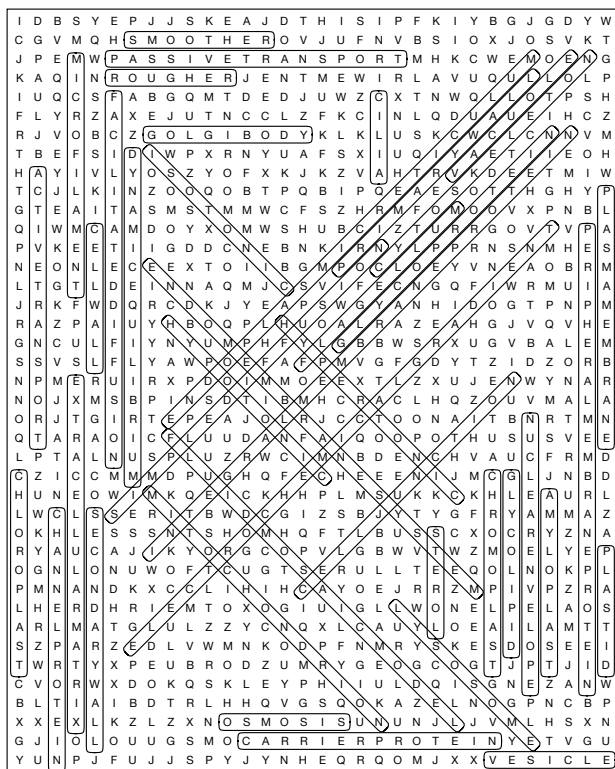
The Biochemical Basis of Life



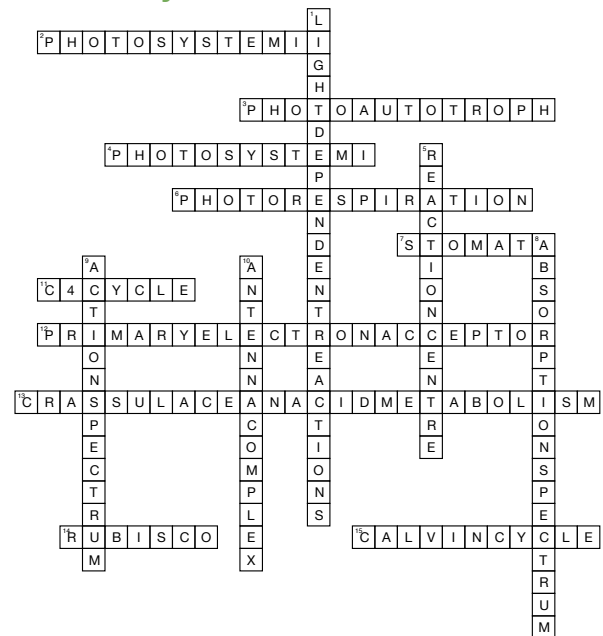
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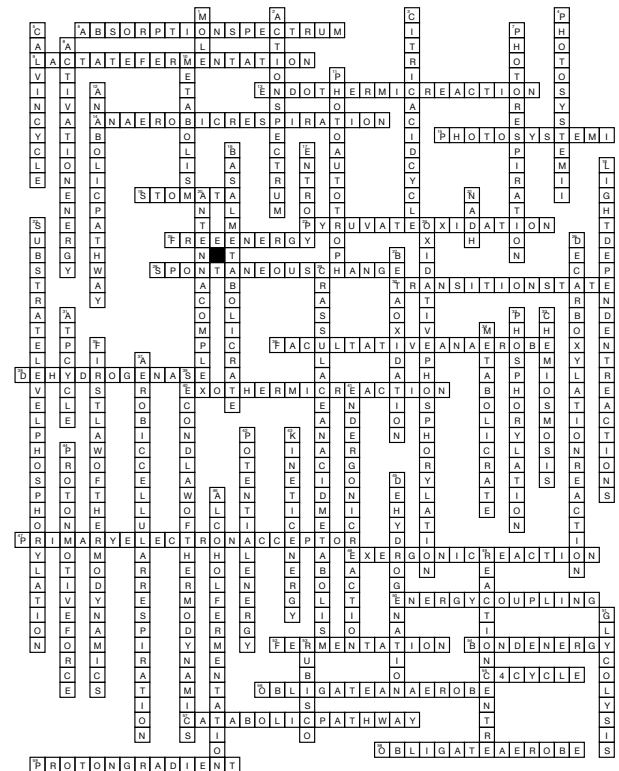
Cell Structure and Function



Photosynthesis



Metabolic Processes



F	P	G	P	X	V	N	O	I	T	C	A	E	R	C	I	N	O	G	R	E	D	N	E	O	J	P
K	W	O	V	H	Y	O	X	N	O	H	Y	E	F	F	H	N	O	O	G	O	E	A	Z	N	S	B
Y	K	Y	L	E	R	E	Q	A	C	T	I	V	A	T	I	O	N	E	N	E	R	G	Y	Y	W	C
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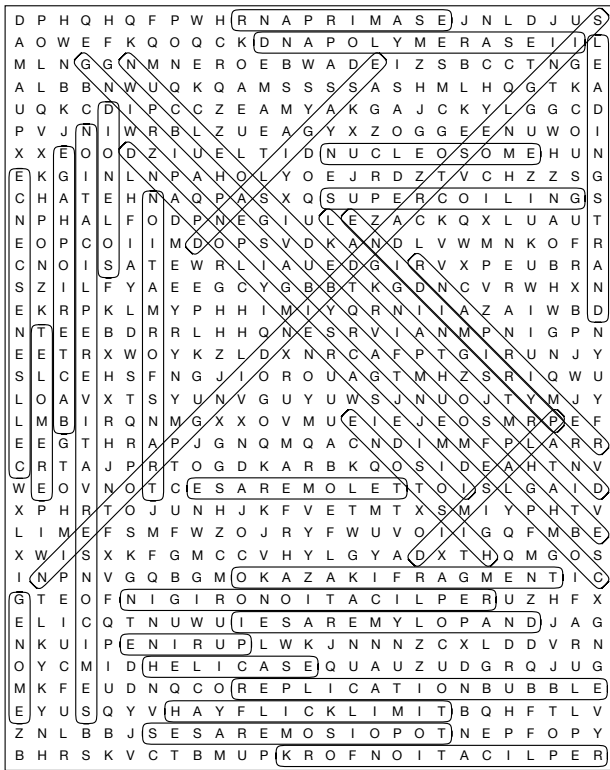
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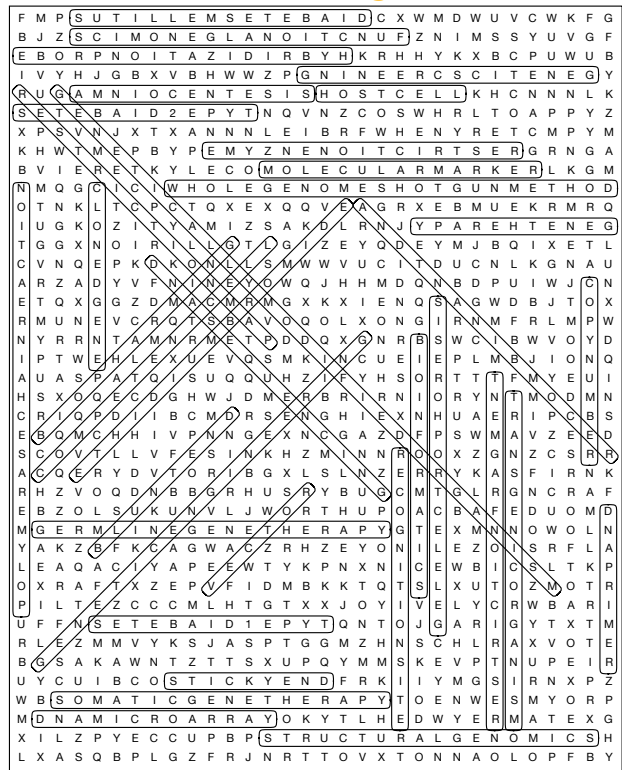
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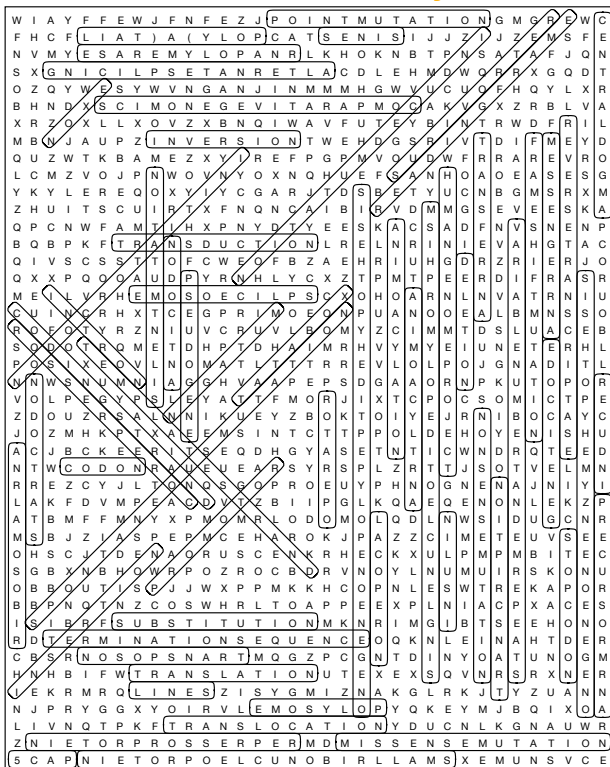
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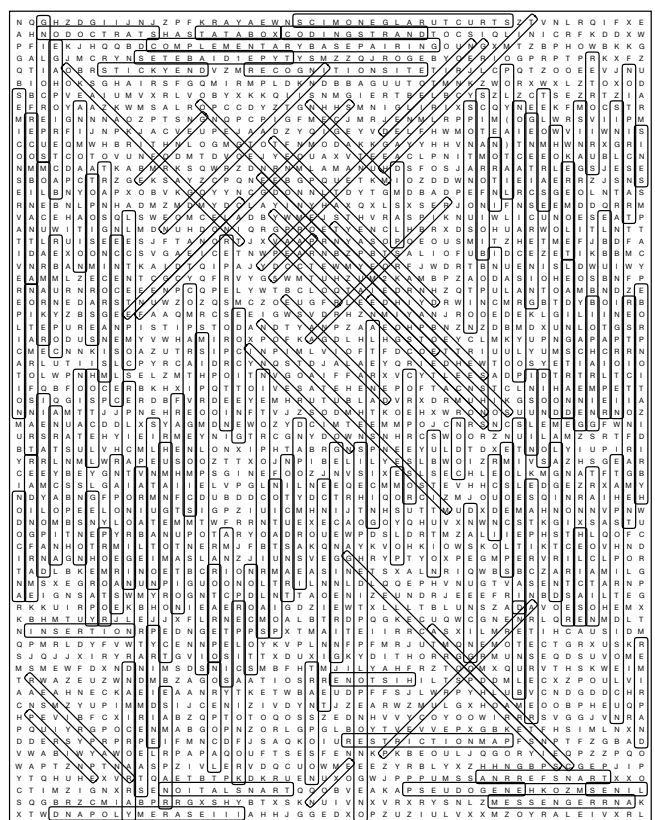
Genetic Technologies



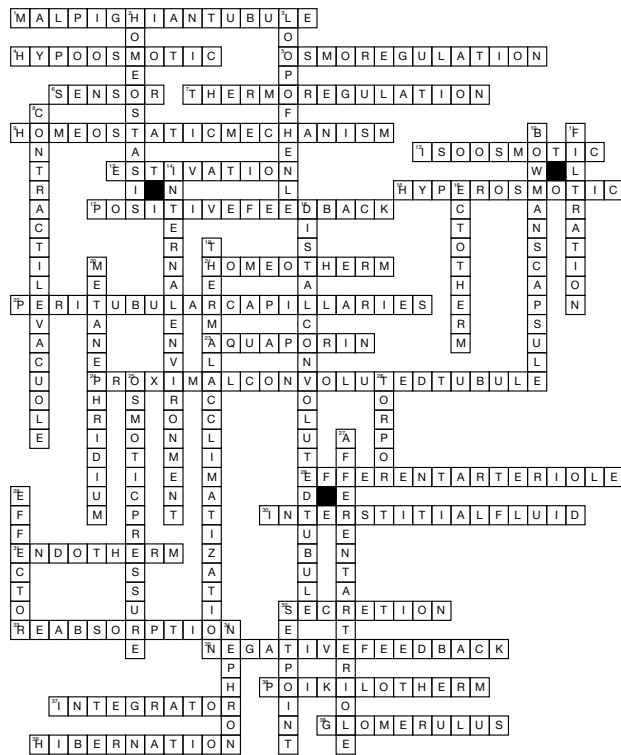
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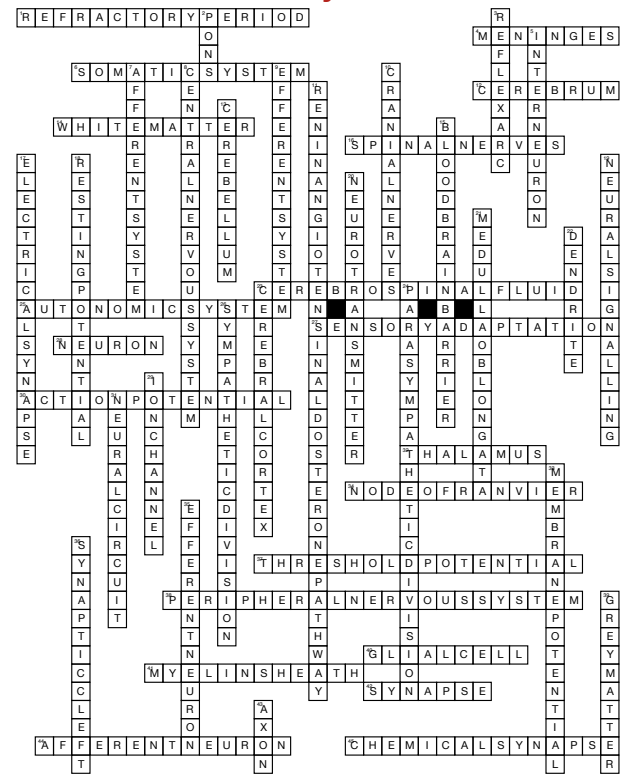
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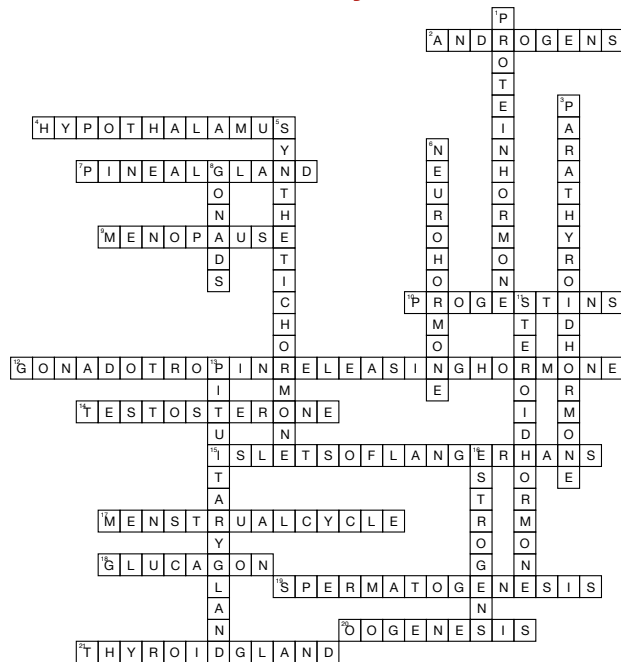
Homeostasis: A Fine Balance



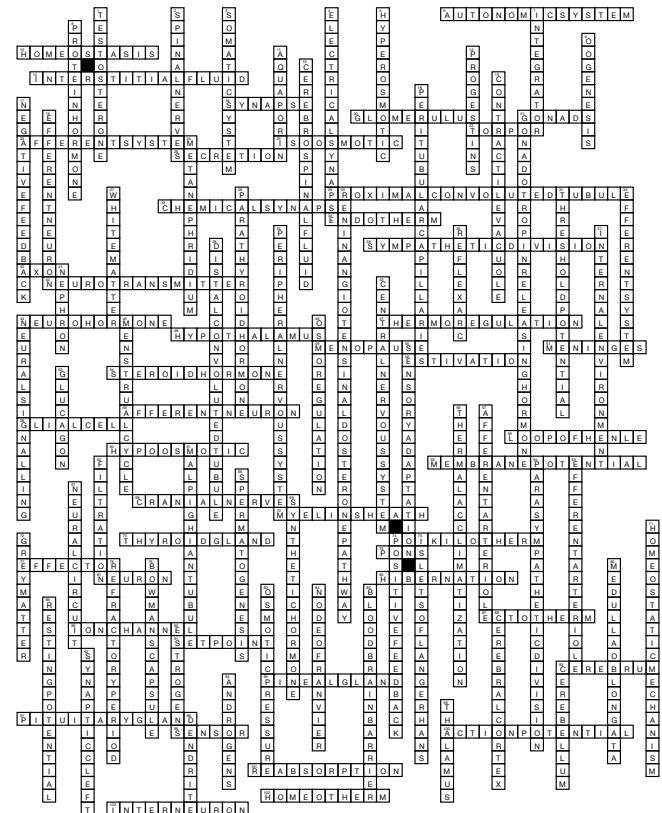
The Nervous System



The Endocrine System



Homeostasis



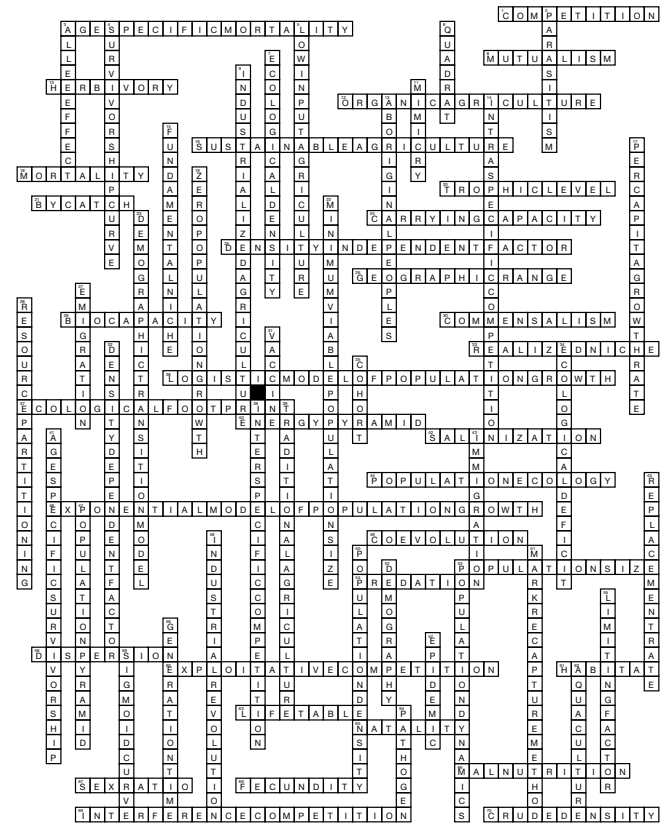
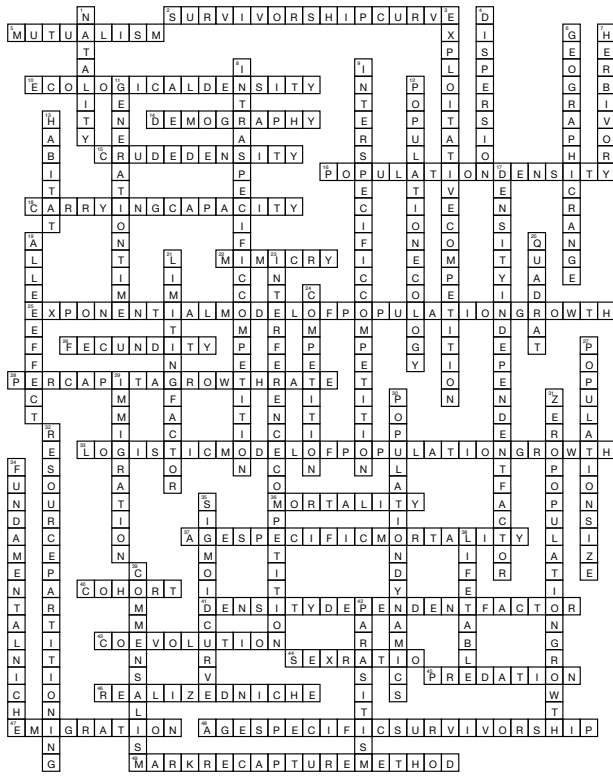
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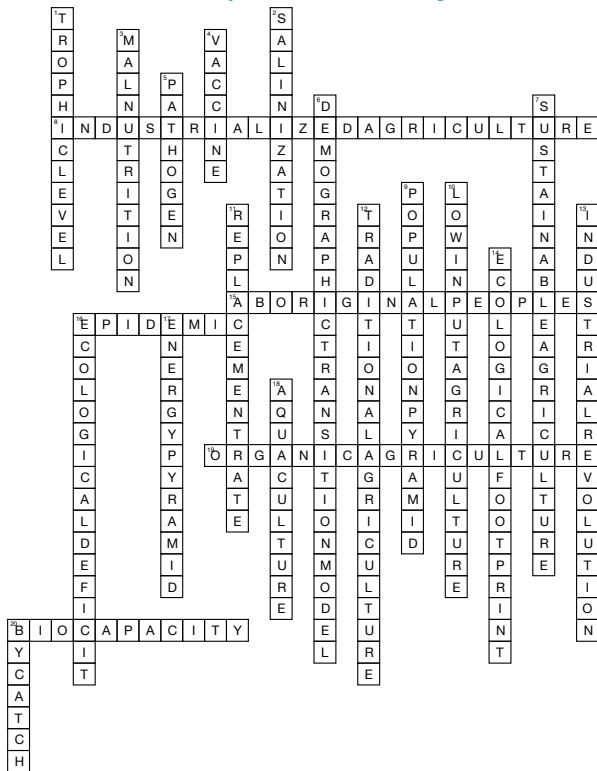
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G	W	Q	B	V	C	E	Y	N	B	Z	K	W	R	H	N	C	Q	O	C	O	I	J	V	K	Q	Y	
P	L	I	J	A	E	G	L	O	Q	O	U	Z	N	F	R	I	R	K	B	M	Q	T	S	L	R	O	
R	F	I	C	S	B	H	O	P	A	N	F	U	I	L	Y	D	Z	Y	Z	Z	R	I	H	U	L	O	
O	K	O	M	Z	D	A	R	H	A	I	S	E	W	V	D	G	I	Z	Q	O	K	H	D	C	I	U	
G	T	A	P	A	T	P	T	T	E	I	T	K	Y	Y	E	H	Q	J	N	B	H	P	V	J	N	D	
E	S	A	Z	J	H	M	S	X	T	O	R	A	N	O	R	Y	O	T	V	K	G	L	Z	O	P	H	
X	D	L	P	W	U	E	D	R	L	J	F	B	U	V	S	D	C	B	L	N	S	X	I	O	B		
T	B	U	J	W	C	O	Q	P	A	F	O	O	G	E	N	E	S	I	S	Q	I	Q	N	C	H	R	
I	P	O	Q	V	E	V	R	Z	E	H	G	U	U	D	M	B	M	F	A	T	S	E	N	X	L	M	
N	S	N	A	H	R	E	G	N	A	L	F	O	S	T	E	L	S	I	O	D	A	N	I	K	U	O	
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W	F	O	E	F	I	M	K	W	Z	U	V	F	W	S	J	L	Y	F	J	E	J	C	L	D	E	D	
Z	W	K	W	S	O	S	W	I	U	Q	L	S	R	K	N	F	A	U	L	R	J	G	N	N	R	H	
P	Q	Y	T	H	L	A	E	W	C	I	G	O	S	E	Y	N	H	N	Z	W	N	D	L	O	G	S	
C	H	A	Y	S	X	I	N	L	P	D	M	G	M	D	N	Y	L	J	M	I	G	A	M	M	N	I	
Z	E	I	V	B	G	O	M	T	E	S	T	O	S	T	E	R	O	N	E	O	P	R	H	P	J	T	
U	Y	X	C	I	N	Z	U	E	G	G	R	B	U	F	T	N	N	O	R	O	A	Q	W	V	G	G	
Z	J	N	E	L	N	R	D	D	O	P	F	H	W	S	S	Y	T	H	R	B	S	J	X	H	A		
R	J	T	N	V	N	Q	C	H	N	H	K	T	I	M	L	L	H	T	D	Z	T	E	K	J	T	S	
P	Z	C	F	K	K	D	R	A	H	F	L	F	A	I	U	T	R	I	R	O	D	C	J	N	F	U	
B	U	R	S	P	B	Q	N	O	J	D	J	M	P	B	O	I	Y	U	D	B	W	L	G	W	L	G	
D	N	R	J	P	S	G	O	Q	A	V	G	U	C														

[illegible]

Population Dynamics



Human Population Dynamics



[illegible]

B S A C C E N T P T P O Y W F U X N L U S L A S H R M O O H W F O E A C
 I S I N T E R F E R E N C E C O M P E T I T I O N A J V D L X A
 F X U M A R Y P Y G R E N Q Z R J O O X U Z I Z G H R T Y W J W H G J A
 X V M S U H A B I T A L O B R P V L G U R X Z C G W B X S M I O R T F U T W H
 I N N U M I N I M U M V I A B L E P O P U L A T I O N S I Z E W R U P G A X L A Z
 C B U G Y U R E P L A C E M E N T R A T E K R T H F V W Y G I S E Y B V B Z B G
 I X C F F L Q J K L C W M M O V R J R R O Z H O I A W U L O R G I Y H L F I O X
 G D F E I I V L F O N X N H Y V S O T S W D Q Q N I Q U I S Y W V R G C Q W R K
 G V N R L R O X E O S Y E T B A T M L J L K C W G F L T P I C E I G E
 L L L N O T U L O V E R A A R T S U D N Q W S U N E N I T J G H A B I
 A N S F G B R U L E A P V T I P O Y H W J O N X A Y C A I Y S B C N K G G Y N
 C U V Y Z M A X H Z L D F M U Z Q O X A T I A U A T J V A I A B O C K H A M
 I R Y S N C B K I G M S S Q J D E Q K N T P E Z R N S P I O M F X I I O O L L K
 G Q H H O S N O I T U L O V E O C X Z X Z V O L I C R A X N W S I D G D T L S V P S
 G O E Z F K E R E P S Q O C S L X W G M V B H C O I L I P I S N G A O F D E R L
 L J C F J L U H S I N U H X O A M O R H O R X M R M R M R M R M R M R M R M R
 C T A X A P I U B L L H U K S X Z X Z V O L I C R A X N W S I D G D T L S V P S
 E I Z I P S Z C O U B L Y X U N E X Z X Z V O L I C R A X N W S I D G D T L S V P S
 D Z T M L T F T Q U N G T I P O Y H W J O N X A Y C A I Y S B C N K G G Y N
 Z W Z A F N R R V O Q M V O S S O R V H D G T Z F Y F E F I C L O D G Z H R
 M G L O Q M Q Q W T N O Q S M V S G O B O C K N T L O D T T I P M G H E E G Y E
 E I B F K N W L Q H T W S X Z X Z V O L I C R A X N W S I D G D T L S V P S
 X I D I W E O T G B I J O N X A Y C A I Y S B C N K G G Y N
 P R Q I C M W A J Y X U N E X Z X Z V O L I C R A X N W S I D G D T L S V P S
 L Q G I C M W A J Y X U N E X Z X Z V O L I C R A X N W S I D G D T L S V P S
 D O O N A T M T I T U N X Z X Z X Z V O L I C R A X N W S I D G D T L S V P S
 I F V V N J I C A P I W O X Z X Z V O L I C R A X N W S I D G D T L S V P S
 T P U C D N N Q U W N P E B B R A C E O P U E E A T N P W I G I U
 A L Y R O V Z N W O T O T D T D N M R G V C I C E O D W O S A I T C E T T
 T R O H O G E C C A R U S I G G I U Z I T G P E C P N J A A T A T F O S I L
 I A Z H E T A Q I S I N U H X O A M O R H O R X M R M R M R M R M R M R M R M R
 V G V I C A L A J Y X U N E X Z X Z V O L I C R A X N W S I D G D T L S V P S
 C H O P I S S L C U E F T T T D T D N M R G V C I C E O D W O S A I T C E T T
 O I O C I I G F O T E S E X O T D D H V C I S U A T P W U L F L D
 M R Y E M N I U A D R A D U P O T D D C E D A G O V N P A T L I I A
 P G F A J A C A O B M I T T T D T D N M R G V C I C E O D W O S A I T C E T T
 E K D U N A D E R Q K I A G P P G E P T A I T R E V P O C D N G R T S K I
 Z S P Y K P E R E P M R Y F F G E X U C C P I Y U E S T P O E O A I J U A
 I A V N D Z Q V C E M E M Z I G V C I Y P E M G T H O N D M O A I R S V
 R Z N S X O T U B H L R A T T T D T D N M R G V C I C E O D W O S A I T C E T T
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 O L S V I A Z A L K F Y R E A L Z E D N C H S I C V G M W I E S V A
 N I K M T I D W O J L R C K M H M V V J D Y N D O G Y O J F F P D N F O U U
 V T U L A X S E P F C D Z I B C C F M O X O D I A N P R E P Y R X X G E I P S U E
 B P F P U K Z M E P X I M I C R V N O L S C D J L O C E F F H O X V T H M S
 S G V U P R F F O N T E M E R U T P A C E R K R A M Y Y O E O C Y X K E O E I F W
 T U R R O I U F B D V F R E N A G N A R P A R G O I X Y Z O W G O E I F W
 R Z N S X O T U B H L R A T T T D T D N M R G V C I C E O D W O S A I T C E T T
 T R A P T O N A A G G C U L T U R K N U W B V Z O V J S T A H J Z A
 K U I P O P U L A T I O N P Y R A M I D J V G O L O C E N O I T A L U P O D S I J P
 H P R J T B U J B Z X X E R U T L U C I R G A D E Z I L A I R T S U D N I H B O B V O
 L A L E E F F E C T O N E L E P L P O P U L A T I O N S I Z E A K U P Y E M H O

P	E	J	U	G	N	T	I	C	I	F	E	D	L	A	C	I	G	O	L	O	C	E	R	C	T	F	L	O
B	I	H	I	V	F	F	Y	P	H	H	P	T	H	J	J	W	M	W	Y	H	K	T	S	K	F	Q	W	
Y	M	H	A	D	M	L	K	I	O	D	N	B	T	H	D	A	B	J	T	D	W	X	R	I	G	M	I	
O	T	R	V	D	M	S	E	S	Z	S	F	R	U	H	N	N	K	N	X	A	D	I	N	K	W	I		
H	H	H	V	U	G	J	Y	P	O	Z	A	F	R	M	L	M	I	K	O	R	E	X	D	M	F	G	X	
G	S	E	L	Q	P	T	A	I	U	O	V	N	M	Q	Y	R	A	I	X	E	R	I	T	A	F	D	C	
J	W	E	L	C	E	L	T	I	D	D	P	G	U	F	I	P	V	T	H	G	P	I	U	T	R	I	W	
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A	L	X	I	L	K	E	S	S	N	E	G	M	B	S	O	U	Q	A	E	T	I	H	M	I	S			
A	I	I	Y	K	H	N	B	N	W	Q	K	A	I	X	Y	I	M	V	Y	S	T	T	Z	E	H	M		
S	M	O	K	C	E	P	K	A	Z	Z	R	A	G	N	R	O	T	T	O	T	U	Y	E	X	L	D	A	
F	H	A	Q	O	W	L	G	Y	R	C	G	W	T	R	A	H	A	I	A	L	D	X	E	R	Y	R	Y	
A	S	C	E	M	H	A	R	D	F	C	T	X	B	F	I</													

Word Puzzles

from *Nelson Biology 12*



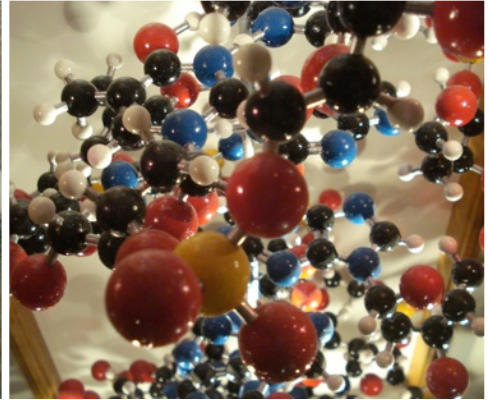
Biochemistry

Contains puzzles for *The Biochemical Basis of Life*, *Cell Structure and Function*, and the whole unit.



Metabolic Processes

Contains puzzles for *An Introduction to Metabolism*, *Cellular Respiration*, *Photosynthesis*, and the whole unit.



Molecular Genetics

Contains puzzles for *DNA*, *Genes and Protein Synthesis*, *Genetic Technologies*, and the whole unit.



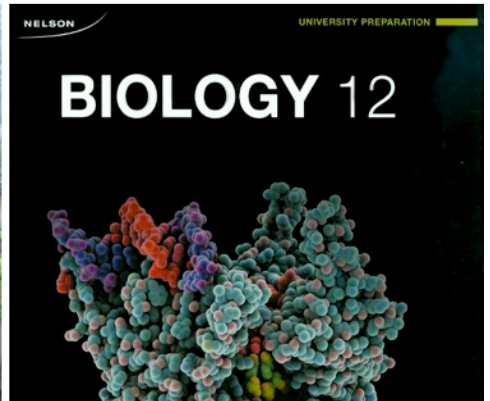
Homeostasis

Contains puzzles for *Homeostasis*, *The Endocrine System*, *The Nervous System*, and the whole unit.



Population Dynamics

Contains puzzles for *Natural Population Dynamics*, *Human Population Dynamics*, and the whole unit.



Nelson Education

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Science is the great antidote to the poison of enthusiasm and superstition.

Adam Smith