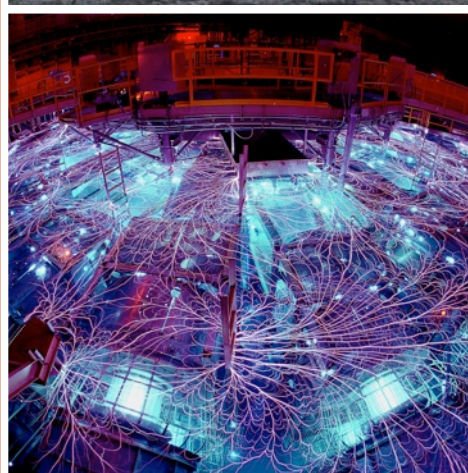


Word Puzzles

from *Nelson Physics 11*

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



Robert Prior

Motion in a Straight Line

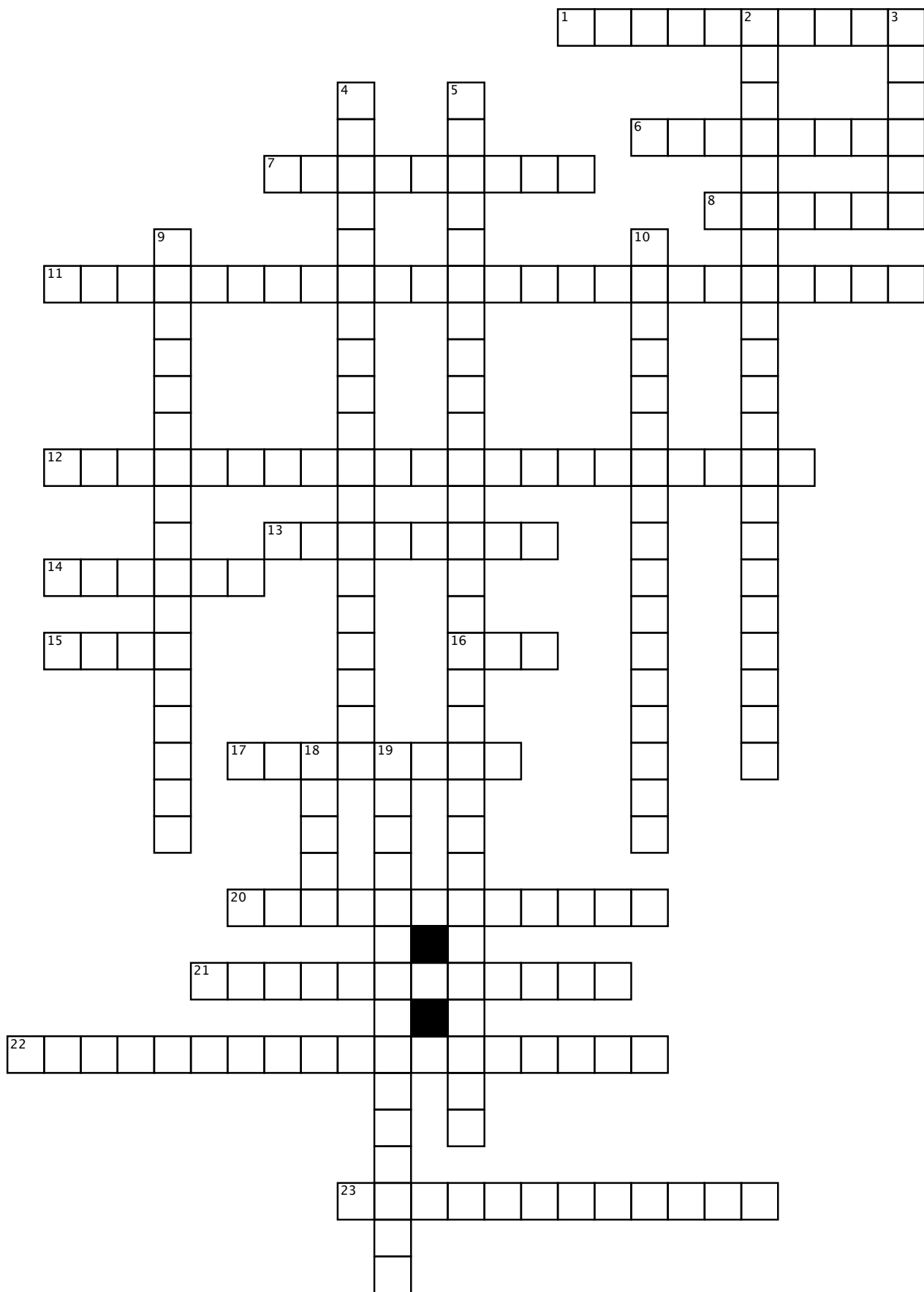
Complete the crossword puzzle.

Across

1. the study of motion
6. the acceleration due to gravity of an object in the absence of air resistance (two words)
7. the line an object moves along from a particular starting point
8. a quantity that has magnitude (size) and direction
11. the acceleration that occurs when an object is allowed to fall freely (four words)
12. the velocity of an object at a specific instant in time (two words)
13. the distance and direction of an object from a reference point
14. a change in an object's location as by a particular observer
15. vertical change between two points on a line
16. horizontal change between two points on a line
17. the total length of the path travelled by an object in motion
20. the total distance travelled divided by the total time taken to travel that distance (two words)
21. how quickly an object's velocity changes over time (the rate of change of velocity)
22. a vector diagram drawn using a specific scale (three words)
23. the change in position of an object

Down

2. a graph describing motion of an object, with acceleration on the vertical axis and time on the horizontal axis (two words)
3. a quantity that has only magnitude (size)
4. a straight line between two points with a specific direction (three words)
5. motion in which velocity changes at a constant rate (four words)
9. a graph describing the motion of an object, with velocity on the vertical axis and time on the horizontal axis (two words)
10. a graph describing the motion of an object, with position on the vertical axis and time on the horizontal axis (two words)
18. a measure of the steepness of a line
19. the total displacement, or change in position, divided by the total time for that displacement (two words)



Motion in Two Dimensions

Complete the crossword puzzle.

Across

3. the x-vector or y-vector that an overall vector can be broken down into (two words)
5. the motion of a projectile under gravity (two words)

Down

1. a vector that results from adding two or more given vectors (two words)
2. an object that moves along a two-dimensional curved trajectory in response to gravity
4. the time taken for a projectile to complete its motion (three words)



Kinematics

Complete the crossword puzzle.

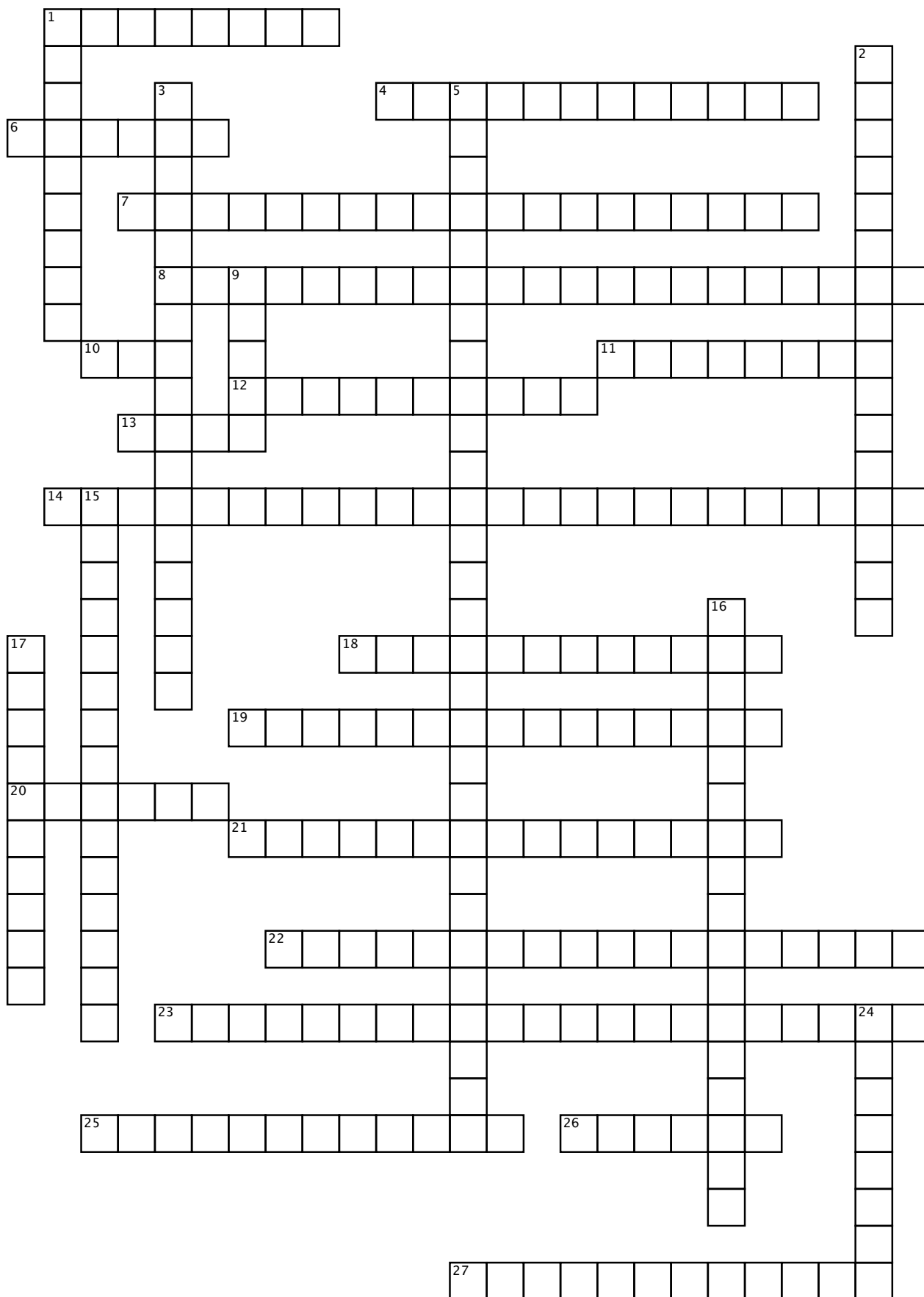
Across

1. the total length of the path travelled by an object in motion
4. the time taken for a projectile to complete its motion (three words)
6. a quantity that has magnitude (size) and direction
7. a straight line between two points with a specific direction (three words)
8. the velocity of an object at a specific instant in time (two words)
10. horizontal change between two points on a line
11. the acceleration due to gravity of an object in the absence of air resistance (two words)
12. an object that moves along a two-dimensional curved trajectory in response to gravity
13. vertical change between two points on a line
14. the acceleration that occurs when an object is allowed to fall freely (four words)
18. the total distance travelled divided by the total time taken to travel that distance (two words)
19. a vector that results from adding two or more given vectors (two words)
20. a change in an object's location as measured by a particular observer
21. the total displacement, or change in position, divided by the total time for that displacement (two words)
22. a vector diagram drawn using a specific scale (three words)

23. a graph describing motion of an object, with acceleration on the vertical axis and time on the horizontal axis (two words)
25. the change in position of an object
26. a quantity that has only magnitude (size)
27. how quickly an object's velocity changes over time (the rate of change of velocity)

Down

1. the line an object moves along from a particular starting point
2. the motion of a projectile under gravity (two words)
3. a graph describing the motion of an object, with position on the vertical axis and time on the horizontal axis (two words)
5. motion in which velocity changes at a constant rate (four words)
9. a measure of the steepness of a line
15. the x-vector or y-vector that an overall vector can be broken down into (two words)
16. a graph describing the motion of an object, with velocity on the vertical axis and time on the horizontal axis (two words)
17. the study of motion
24. the distance and direction of an object from a reference point



Motion in a Straight Line

Find the words in the puzzle.

- the study of motion
- a change in an object's location as measured by a particular observer
- the total length of the path travelled by an object in motion
- the line an object moves along from a particular starting point
- a quantity that has only magnitude (size)
- a quantity that has magnitude (size) and direction
- the distance and direction of an object from a reference point
- the change in position of an object
- a vector diagram drawn using a specific scale (three words)
- a straight line between two points with a specific direction (three words)
- the total distance travelled divided by the total time taken to travel that distance (two words)
- the total displacement, or change in position, divided by the total time for that displacement (two words)
- a graph describing the motion of an object, with position on the vertical axis and time on the horizontal axis (two words)
- a measure of the steepness of a line
- vertical change between two points on a line
- horizontal change between two points on a line
- how quickly an object's velocity changes over time (the rate of change of velocity)
- a graph describing the motion of an object, with velocity on the vertical axis and time on the horizontal axis (two words) the velocity of an object at a specific instant in time (two words)
- motion in which velocity changes at a constant rate (four words)
- a graph describing motion of an object, with acceleration on the vertical axis and time on the horizontal axis (two words)
- the acceleration that occurs when an object is allowed to fall freely (four words)
- the acceleration due to gravity of an object in the absence of air resistance (two words)

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

Motion in Two Dimensions

Find the words in the puzzle.

- a vector that results from adding two or more given vectors (two words)
- the x-vector or y-vector that an overall vector can be broken down into (two words)
- an object that moves along a two-dimensional curved trajectory in response to gravity
- the motion of a projectile under gravity (two words)
- the time taken for a projectile to complete its motion (three words)

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

Kinematics

Find the words in the puzzle.

- the study of motion
- a change in an object's location as measured by a particular observer
- the total length of the path travelled by an object in motion
- the line an object moves along from a particular starting point
- a quantity that has only magnitude (size)
- a quantity that has magnitude (size) and direction
- the distance and direction of an object from a reference point
- the change in position of an object
- a vector diagram drawn using a specific scale (three words)
- a straight line between two points with a specific direction (three words)
- the total distance travelled divided by the total time taken to travel that distance (two words)
- the total displacement, or change in position, divided by the total time for that displacement (two words)
- a graph describing the motion of an object, with position on the vertical axis and time on the horizontal axis (two words)
- a measure of the steepness of a line
- vertical change between two points on a line
- horizontal change between two points on a line
- how quickly an object's velocity changes over time (the rate of change of velocity)
- a graph describing the motion of an object, with velocity on the vertical axis and time on the horizontal axis (two words)
- the velocity of an object at a specific instant in time (two words)
- motion in which velocity changes at a constant rate (four words)
- a graph describing motion of an object, with acceleration on the vertical axis and time on the horizontal axis (two words)
- the acceleration that occurs when an object is allowed to fall freely (four words)
- the acceleration due to gravity of an object in the absence of air resistance (two words)
- a vector that results from adding two or more given vectors (two words)
- the x-vector or y-vector that an overall vector can be broken down into (two words)
- an object that moves along a two-dimensional curved trajectory in response to gravity
- the motion of a projectile under gravity (two words)
- the time taken for a projectile to complete its motion (three words)

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

Newton's Laws of Motion

Complete the crossword puzzle.

Across

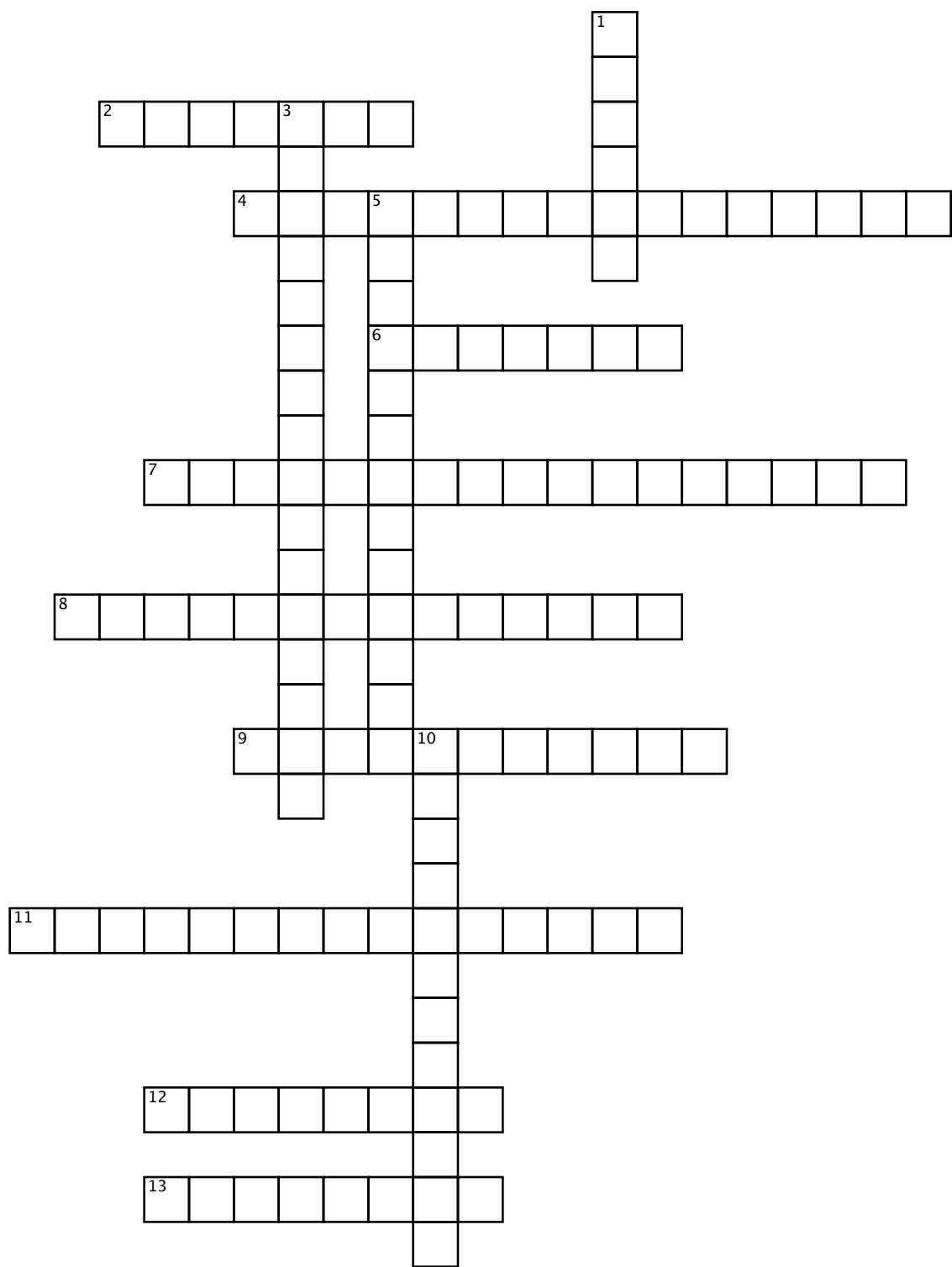
2. the property of matter that causes it to resist changes in motion; inertia is directly proportional to the mass of an object
4. an object will remain at rest or continue to move at constant velocity when the net force on the object is zero (four words)
6. a pulling force from a rope or string on an object that always points towards the rope or string
7. an object will accelerate in the direction of the net force; the magnitude of the acceleration is directly proportional to the magnitude of the net force and inversely proportional to the object's mass (four words)
8. force of attraction between any two objects (three words)
9. a perpendicular force exerted by a surface on an object in contact with the surface; the normal force always points away from the surface (two words)
11. a simple drawing of an object showing all the forces that are acting on it (two words)

12. opposes the sliding of two surfaces across one another; friction acts opposite to the motion or attempted motion

13. the study of the causes of motion

Down

1. the SI unit of force
3. each action force has a reaction force that is equal in magnitude and opposite in direction (four words)
5. a simple sketch of all objects involved in a situation (two words)
10. a force that results when one object makes contact with another object and pushes or pulls it (two words)



Applications of Forces

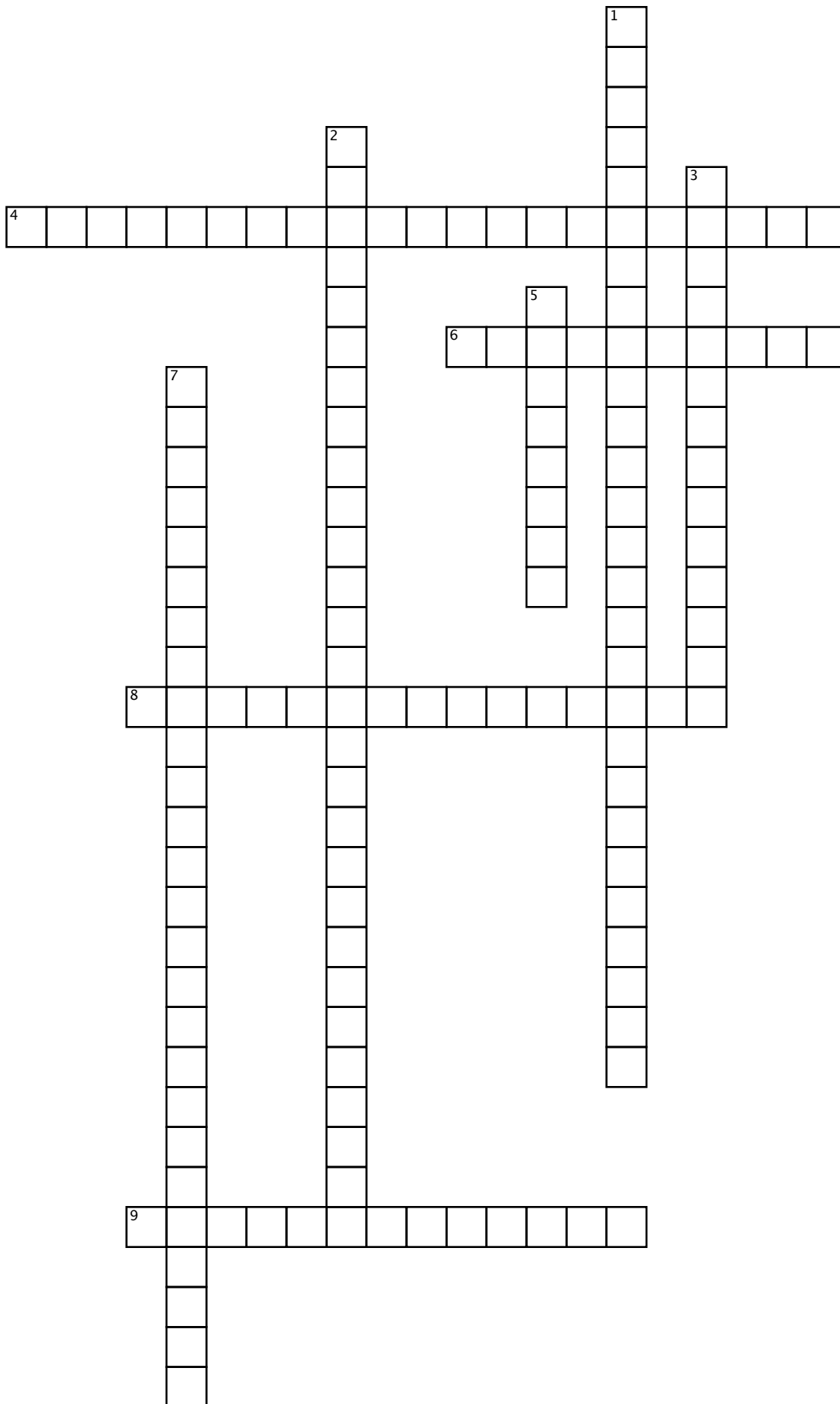
Complete the crossword puzzle.

Across

4. the ratio of the force of friction to the normal force (three words)
6. a region of space surrounding an object that can exert a force on other objects that are placed within that region and are able to interact with that force (two words)
8. the force exerted on a moving object by a surface opposite to the direction of motion of the object (two words)
9. the maximum constant speed of a falling object (two words)

Down

1. the ratio of the maximum force of static friction to the normal force (four words)
2. the ratio of kinetic friction to the normal force (four words)
3. a force of friction that prevents the sliding of two surfaces relative to one another (two words)
5. the motion of an object where the only force acting on the object is gravity (two words)
7. the force per unit mass acting on an object when placed in a gravitational field (three words)



Forces

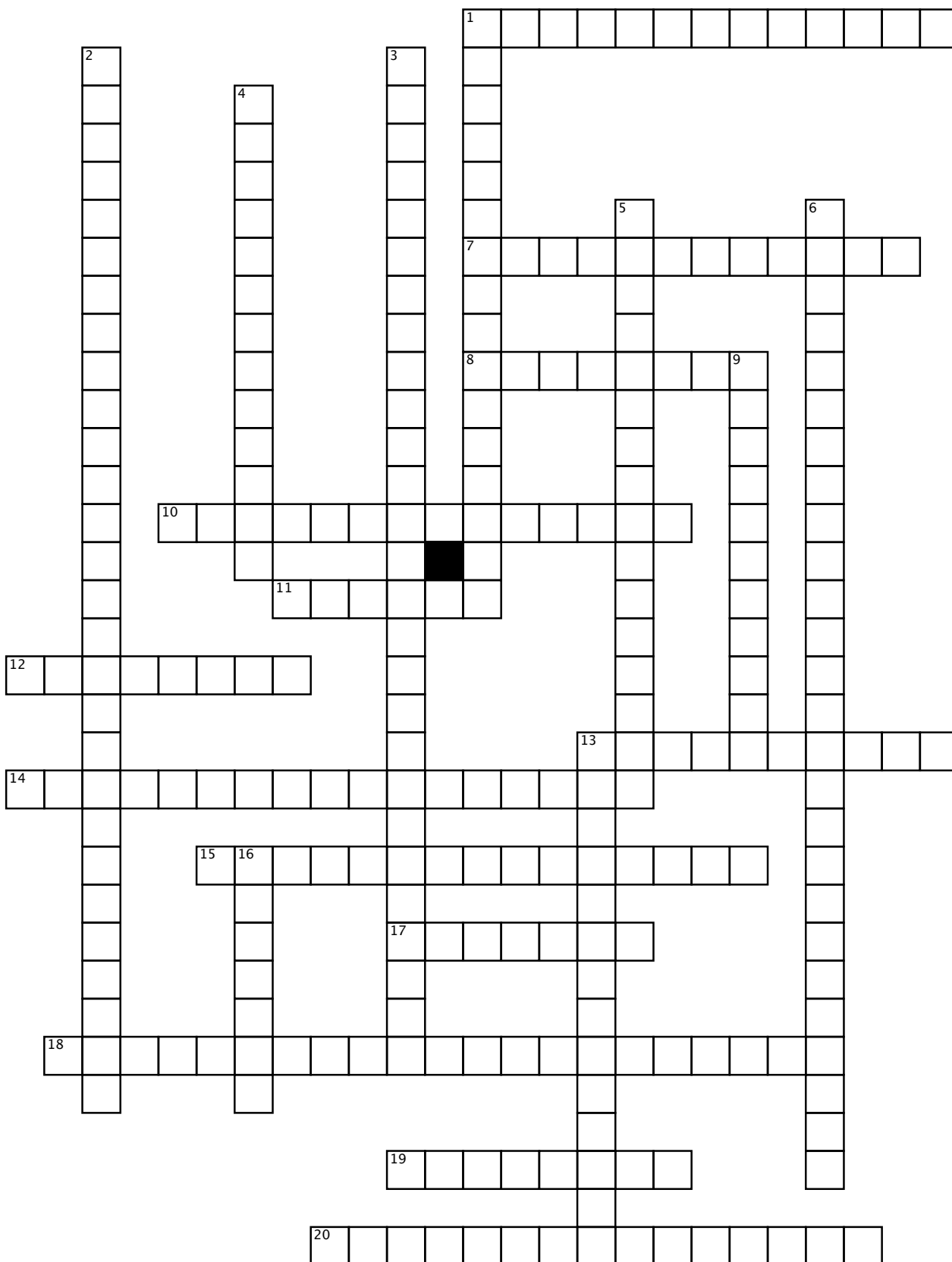
Complete the crossword puzzle.

Across

1. the maximum constant speed of a falling object (two words)
7. a force that results when one object makes contact with another object and pushes or pulls it (two words)
8. opposes the sliding of two surfaces across one another; friction acts opposite to the motion or attempted motion
10. a force of friction that prevents the sliding of two surfaces relative to one another (two words)
11. the SI unit of force
12. the motion of an object where the only force acting on the object is gravity (two words)
13. a region of space surrounding an object that can exert a force on other objects that are placed within that region and are able to interact with that force (two words)
14. an object will accelerate in the direction of the net force; the magnitude of the acceleration is directly proportional to the magnitude of the net force and inversely proportional to the object's mass (four words)
15. the force exerted on a moving object by a surface opposite to the direction of motion of the object (two words)
17. a pulling force from a rope or string on an object that always points towards the rope or string
18. the ratio of the force of friction to the normal force (three words)
19. the study of the causes of motion
20. a simple drawing of an object showing all the forces that are acting on it (two words)

Down

1. each action force has a reaction force that is equal in magnitude and opposite in direction (four words)
2. the ratio of kinetic friction to the normal force (four words)
3. the ratio of the maximum force of static friction to the normal force (four words)
4. a simple sketch of all objects involved in a situation (two words)
5. an object will remain at rest or continue to move at constant velocity when the net force on the object is zero (four words)
6. the force per unit mass acting on an object when placed in a gravitational field (three words)
9. a perpendicular force exerted by a surface on an object in contact with the surface; the normal force always points away from the surface (two words)
13. force of attraction between any two objects (three words)
16. the property of matter that causes it to resist changes in motion; inertia is directly proportional to the mass of an object



Newton's Laws of Motion

Find the words in the puzzle.

- the study of the causes of motion
- the SI unit of force
- a simple sketch of all objects involved in a situation (two words)
- a simple drawing of an object showing all the forces that are acting on it (two words)
- a force that results when one object makes contact with another object and pushes or pulls it (two words)
- a pulling force from a rope or string on an object that always points towards the rope or string
- a perpendicular force exerted by a surface on an object in contact with the surface; the normal force always points away from the surface (two words)
- opposes the sliding of two surfaces across one another; friction acts opposite to the motion or attempted motion
- force of attraction between any two objects (three words)
- the property of matter that causes it to resist changes in motion; inertia is directly proportional to the mass of an object
- an object will remain at rest or continue to move at constant velocity when the net force on the object is zero (four words)
- an object will accelerate in the direction of the net force; the magnitude of the acceleration is directly proportional to the magnitude of the net force and inversely proportional to the object's mass (four words)
- each action force has a reaction force that is equal in magnitude and opposite in direction (four words)

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

Applications of Forces

Find the words in the puzzle.

- the motion of an object where the only force acting on the object is gravity (two words)
- the maximum constant speed of a falling object (two words)
- a region of space surrounding an object that can exert a force on other objects that are placed within that region and are able to interact with that force (two words)
- the force per unit mass acting on an object when placed in a gravitational field (three words)
- a force of friction that prevents the sliding of two surfaces relative to one another (two words)
- the force exerted on a moving object by a surface opposite to the direction of motion of the object (two words)
- the ratio of the force of friction to the normal force (three words)
- the ratio of the maximum force of static friction to the normal force (four words)
- the ratio of kinetic friction to the normal force (four words)

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

Forces

Find the words in the puzzle.

- the study of the causes of motion
- the SI unit of force
- a simple sketch of all objects involved in a situation (two words)
- a simple drawing of an object showing all the forces that are acting on it (two words)
- a force that results when one object makes contact with another object and pushes or pulls it (two words)
- a pulling force from a rope or string on an object that always points towards the rope or string
- a perpendicular force exerted by a surface on an object in contact with the surface; the normal force always points away from the surface (two words)
- opposes the sliding of two surfaces across one another; friction acts opposite to the motion or attempted motion
- force of attraction between any two objects (three words)
- the property of matter that causes it to resist changes in motion; inertia is directly proportional to the mass of an object
- an object will remain at rest or continue to move at constant velocity when the net force on the object is zero (four words)
- an object will accelerate in the direction of the net force; the magnitude of the acceleration is directly proportional to the magnitude of the net force and inversely proportional to the object's mass (four words)
- each action force has a reaction force that is equal in magnitude and opposite in direction (four words)
- the motion of an object where the only force acting on the object is gravity (two words)
- the maximum constant speed of a falling object (two words)
- a region of space surrounding an object that can exert a force on other objects that are placed within that region and are able to interact with that force (two words)
- the force per unit mass acting on an object when placed in a gravitational field (three words)
- a force of friction that prevents the sliding of two surfaces relative to one another (two words)
- the force exerted on a moving object by a surface opposite to the direction of motion of the object (two words)
- the ratio of the force of friction to the normal force (three words)
- the ratio of the maximum force of static friction to the normal force (four words)
- the ratio of kinetic friction to the normal force (four words)

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

Work, Energy, Power, and Society

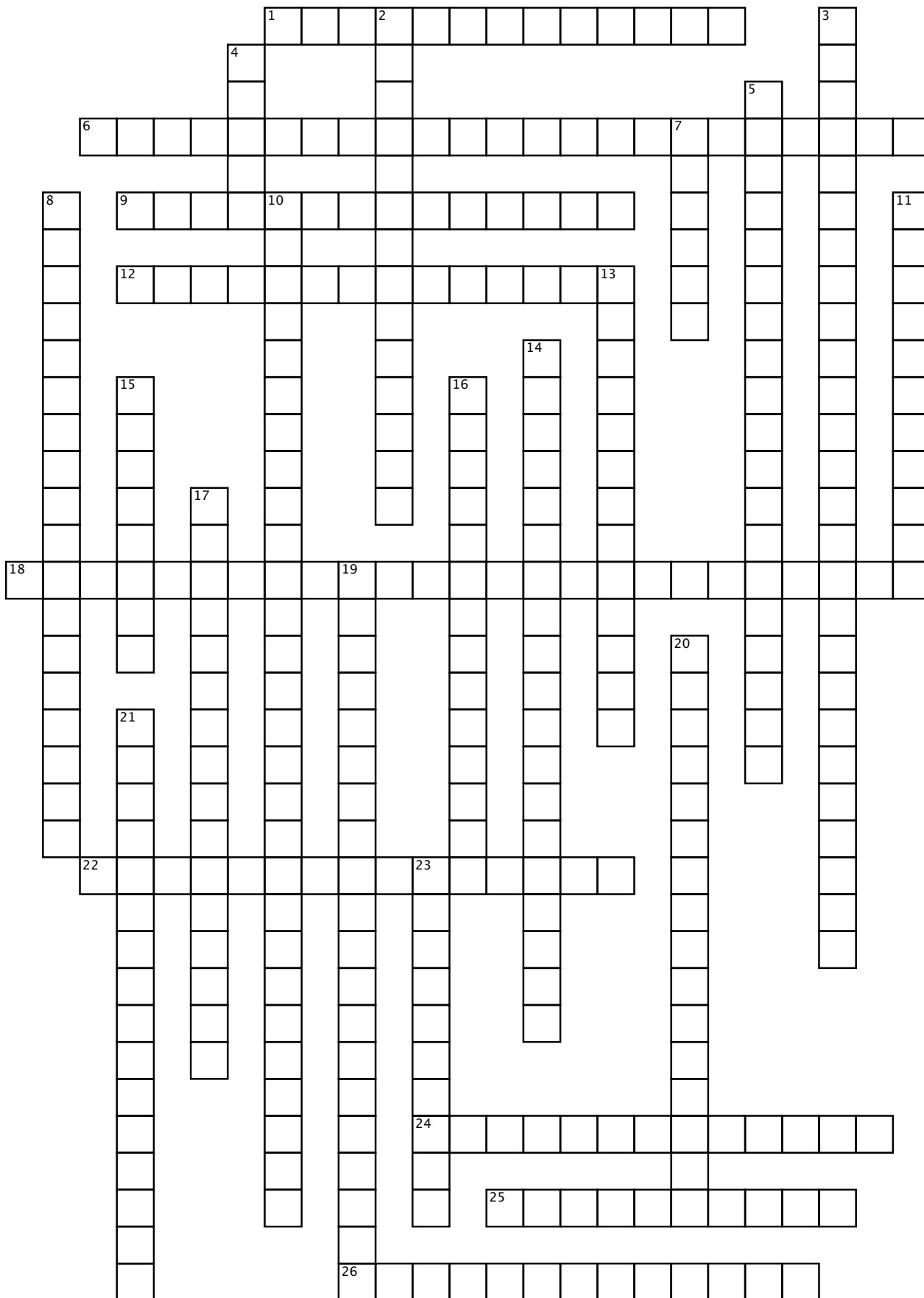
Complete the crossword puzzle.

Across

1. kinetic energy of randomly moving atoms and molecules (two words)
6. a substance with an unlimited supply or a supply that can be replenished as the substance is used in energy-transforming processes (three words)
9. energy-rich substance (two words)
12. applying a force to an object that displaces the object in the direction of the force or a component of the force (two words)
18. energy is neither created nor destroyed; when energy is transformed from one form into another, no energy is lost (five words)
22. a form of energy an object possesses because of its position in relation to forces in the environment (two words)
24. potential energy of protons and neutrons in atomic nuclei (two words)
25. fuel produced by the decayed and compressed remains of plants that lived hundreds of millions of years ago (two words)
26. the combination of small atomic nuclei to form larger atomic nuclei (two words)
5. the net amount of mechanical work done on an object equals the object's change in kinetic energy (two words)
7. the capacity to do work
8. building design that takes the Sun's radiant energy directly for heating (three words)
10. energy possessed by an object due to its position relative to the surface of Earth (three words)
11. radiant energy from the sun (two words)
13. energy possessed by moving objects (two words)
14. a large electricity distribution system composed of a network of electrical power plants and electricity distribution towers and cables (three words)
15. reduced supply of electricity caused by system damage or excess demand
16. the decomposition of large, unstable nuclei into smaller, more stable nuclei (two words)
17. the sum of kinetic energy and gravitational potential energy (two words)
19. the change of one type of energy into another (two words)

Down

2. a designated level to which objects may fall; considered to have a gravitational potential energy value of 0 J (two words)
3. a substance that cannot be replenished as it is used in energy-transforming processes (three words)
4. the rate of transforming energy or doing work
20. a device that transforms radiant energy into electrical energy (two words)
21. electricity produced by transforming the kinetic energy of rushing water into electrical energy
23. the amount of useful energy produced in an energy transformation expressed as a percentage of the total amount of energy used



Thermal Energy and Society

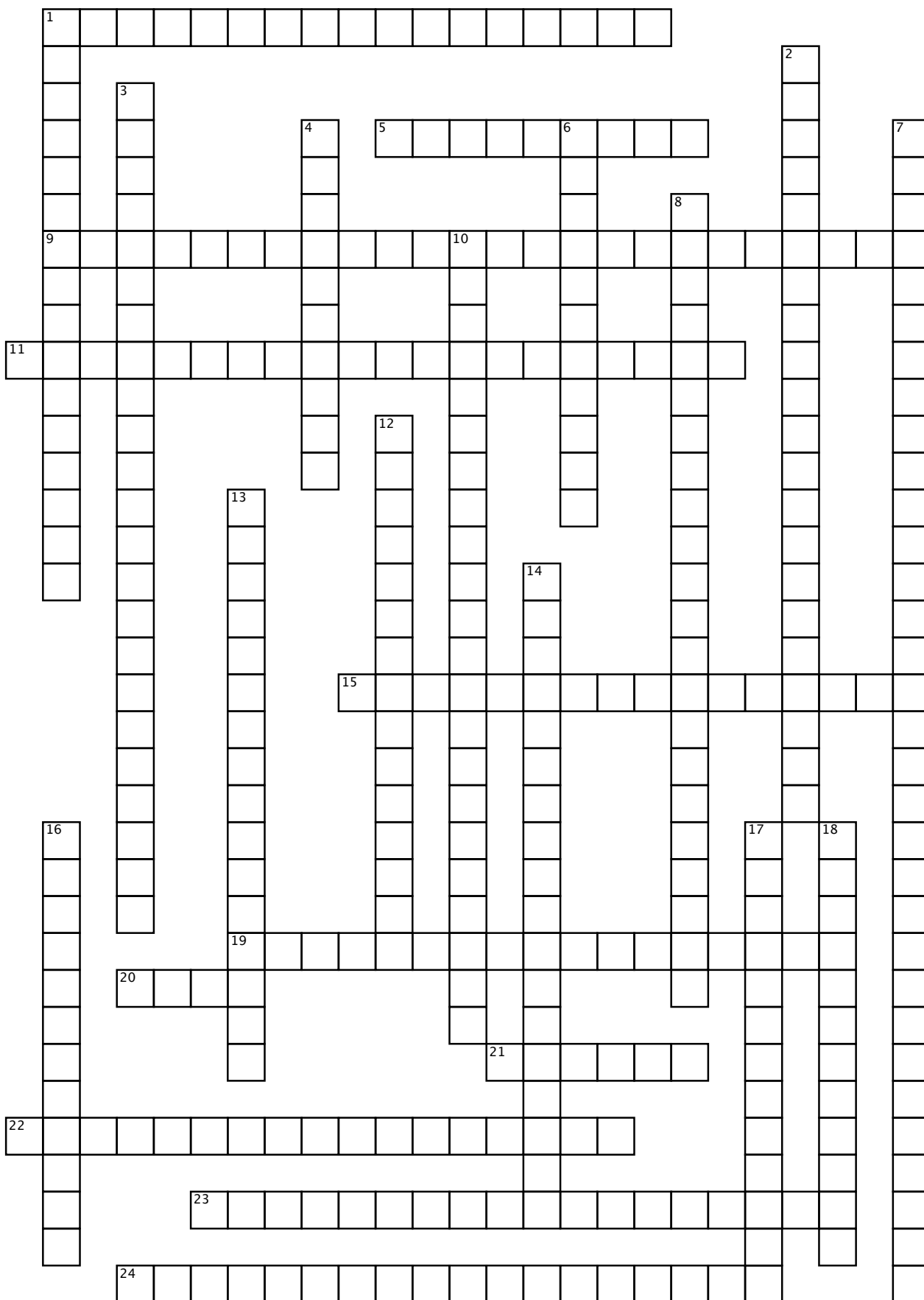
Complete the crossword puzzle.

Across

1. the transfer of thermal energy that occurs when warmer objects are in physical contact with colder objects (two words)
5. the movement of thermal energy as electromagnetic waves
9. the amount of thermal energy required to change a liquid into a gas or a gas into a liquid (four words)
11. the amount of energy, in Joules, required to increase the temperature of 1 kg of a substance by 1 °C (three words)
15. a system that transfers thermal energy from under Earth's surface into a building to heat it, and transfers thermal energy from the building into the ground to cool the building (two words)
19. a current that occurs when a fluid is continuously heated; caused by warmer, less dense fluid being constantly pushed upward as colder, denser fluid falls downward (two words)
20. the transfer of thermal energy from a substance with a higher temperature to a substance with a lower temperature
21. the process by which a solid changes to a liquid
22. the temperature at which a gas changes into a liquid; equal to the boiling point for a given substance (two words)
23. the contraction of a substance when it cools down (two words)
24. the amount of thermal energy required for 1 kg of a substance to change from one state into another (three words)

Down

1. the expansion of a substance as it warms up (two words)
2. a system that uses hot water to heat a building (four words)
3. a system that uses electricity to produce thermal energy for heating (three words)
4. the total thermal energy absorbed or released when a substance changes state (two words)
6. a measure of the average kinetic energy of the particles in a substance
7. when thermal energy is transferred from a warmer object to a colder object, the amount of thermal energy released by the warmer object is equal to the amount of thermal energy absorbed by the colder object (five words)
8. the theory that describes the motion of molecules or atoms in a substance in terms of kinetic energy (three words)
10. a system that moves hot air to heat a building (three words)
12. the temperature scale based on the boiling point and freezing point of brine (two words)
13. a material that is a good conductor of thermal energy (two words)
14. the amount of thermal energy required to change a solid into a liquid or a liquid into a solid (four words)
16. the temperature at which a liquid changes into a gas; equal to the condensation point for a given substance (two words)
17. the temperature at which a liquid changes into a solid; equal to the melting point for a given substance (two words)
18. the temperature at which a solid changes into a liquid; equal to the freezing point for a given substance (two words)



Nuclear Energy and Society

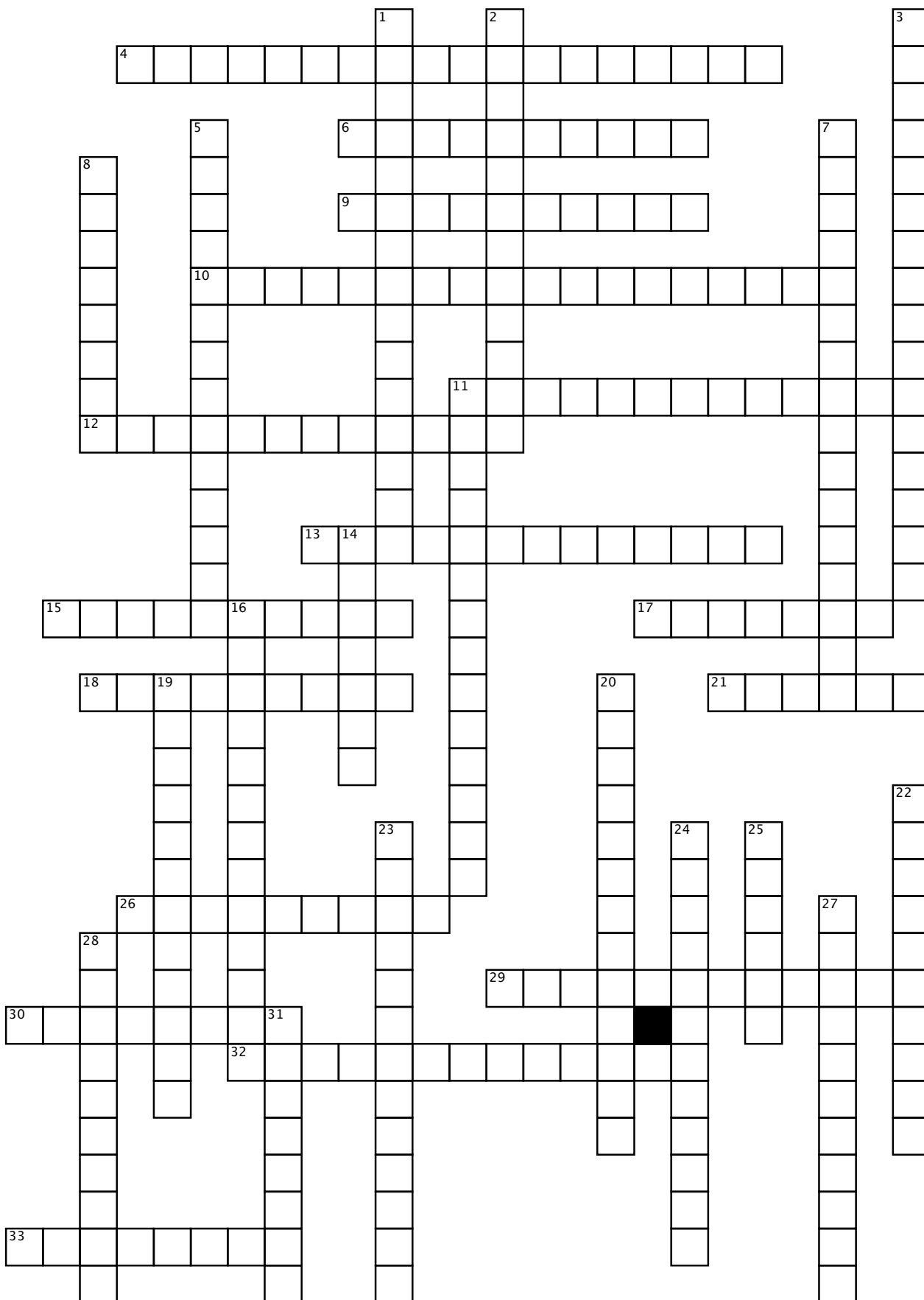
Complete the crossword puzzle.

Across

4. the very strong force of attraction between nucleons (three words)
6. nuclear reaction in which an alpha particle is emitted (two words)
9. a reaction in which an excited nucleus returns to a lower, more stable energy state, releasing a very high-energy gamma ray in the process (two words)
10. the force of attraction or repulsion due to electric charges (two words)
11. a particle emitted during alpha decay composed of a helium nucleus containing two protons and two neutrons (two words)
12. state in which one or more electrons are at higher energy levels than in the ground state (two words)
13. the energy used to hold a nucleus together (two words)
15. the reactant atom in a nuclear reaction (two words)
17. an uncharged particle in the nucleus of an atom
18. energy released when the nucleus of an unstable isotope undergoes a change in structure
21. a positively charged particle in the nucleus of an atom
26. nuclear reaction in which a beta particle is emitted or captured (two words)
29. an unstable isotope that spontaneously changes its nuclear structure and releases energy in the form of radiation
30. a particle with a positive charge and the same mass as an electron
32. a nuclear reaction in which the nuclei of two atoms fuse together to form a larger nucleus (two words)
33. a negatively charged particle found in the space surrounding the nucleus of an atom

Down

1. the process by which the nucleus of an atom sometimes changes (two words)
2. a high-energy electron or positron ejected or captured by a nucleus during beta decay (two words)
3. the process by which a radioactive atom's nucleus breaks apart and forms different atoms (two words)
5. the decomposition of large, unstable nuclei into smaller, more stable nuclei (two words)
7. the energy required to accelerate an electron through a potential difference of 1 million volts (two words)
8. the average length of time it takes radioactive material to decay to half of its original mass
11. a unit of mass equal to 1.66×10^{-27} kg (three words)
14. a form of an element that has the same atomic number, but a different mass number than all other forms of that element
16. a nuclear decay process in which daughter atoms are different elements from parent atoms
19. the product atom in a nuclear reaction (two words)
20. a process by which the nucleus of an atom spontaneously changes
22. the difference between the calculated mass of an atom, based on the nucleons and electrons present, and the actual atomic mass (two words)
23. the repeated series of reactions in which the products of one reaction generate subsequent reactions (two words)
24. the number of protons in the nucleus (two words)
25. a high-energy particle with no mass
27. state in which all electrons are at their lowest possible energy levels (two words)
28. the number of protons and neutrons in the nucleus (two words)
31. particles in the nucleus of an atom; protons and neutrons



Energy and Society

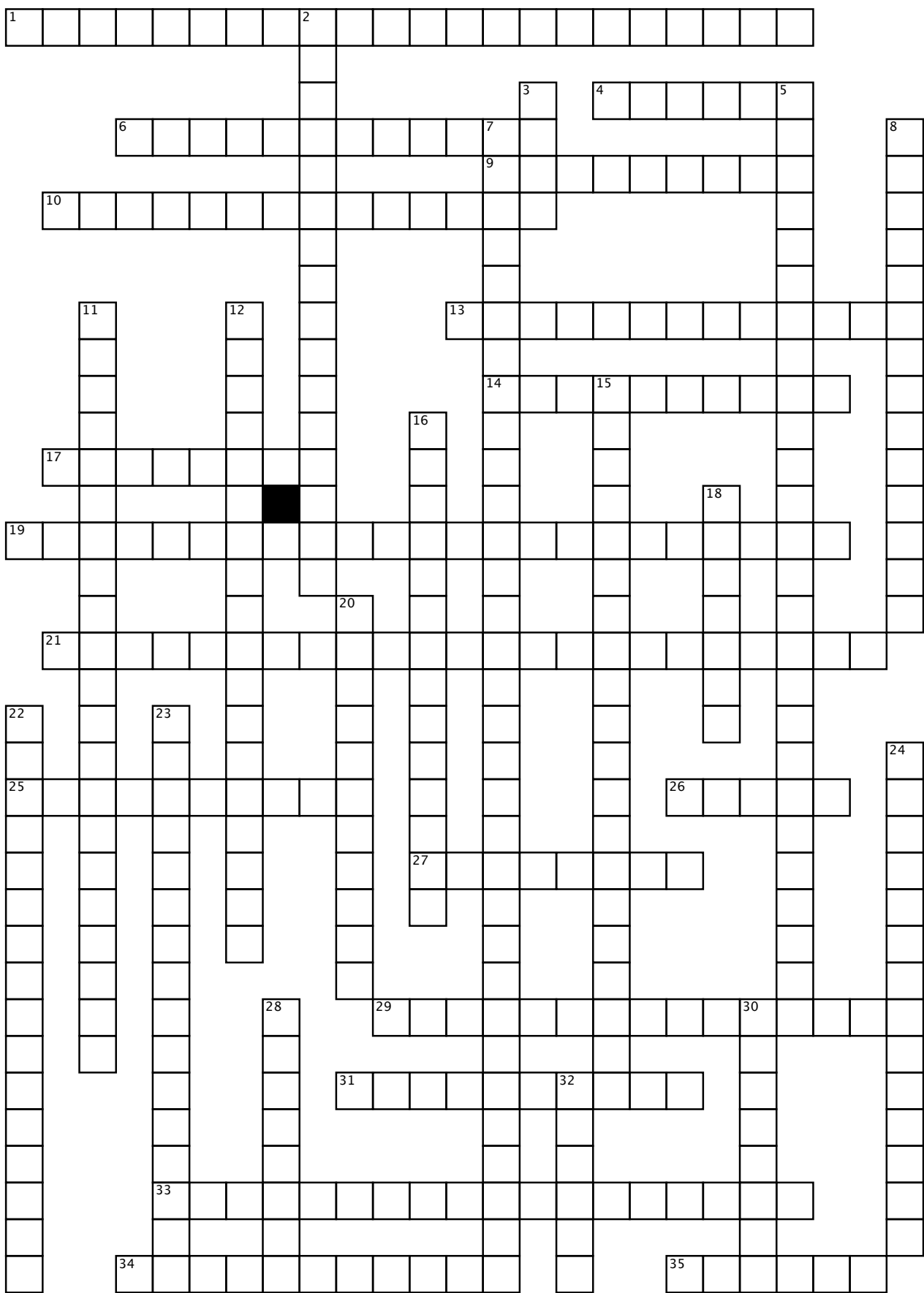
Complete the crossword puzzle.

Across

1. a system that moves hot air to heat a building (three words)
4. a positively charged particle in the nucleus of an atom
6. an unstable isotope that spontaneously changes its nuclear structure and releases energy in the form of radiation
9. the movement of thermal energy as electromagnetic waves
10. a unit of mass equal to 1.66×10^{-27} kg (three words)
13. energy possessed by moving objects (two words)
14. the total thermal energy absorbed or released when a substance changes state (two words)
17. the average length of time it takes radioactive material to decay to half of its original mass
19. a system that uses electricity to produce thermal energy for heating (three words)
21. a substance with an unlimited supply or a supply that can be replenished as the substance is used in energy-transforming processes (three words)
25. the transfer of thermal energy through a fluid that occurs when colder, denser fluid falls and pushes up warmer, less dense fluid
26. the rate of transforming energy or doing work
27. a negatively charged particle found in the space surrounding the nucleus of an atom
29. a form of energy an object possesses because of its position in relation to forces in the environment (two words)
31. the amount of useful energy produced in an energy transformation expressed as a percentage of the total amount of energy used
33. the contraction of a substance when it cools down (two words)
34. state in which all electrons are at their lowest possible energy levels (two words)
35. the process by which a solid changes to a liquid

Down

2. the process by which a radioactive atom's nucleus breaks apart and forms different atoms (two words)
3. the transfer of thermal energy from a substance with a higher temperature to a substance with a lower temperature
5. a substance that cannot be replenished as it is used in energy-transforming processes (three words)
7. when thermal energy is transferred from a warmer object to a colder object, the amount of thermal energy released by the warmer object is equal to the amount of thermal energy absorbed by the colder object (five words)
8. energy-rich substance (two words)
11. a system that uses hot water to heat a building (four words)
12. the amount of thermal energy required for 1 kg of a substance to change from one state into another (three words)
15. the change of one type of energy into another (two words)
16. a designated level to which objects may fall; considered to have a gravitational potential energy value of 0 J (two words)
18. a form of an element that has the same atomic number, but a different mass number than all other forms of that element
20. the temperature scale developed using absolute zero as the point at which there is virtually no motion in the particles of a substance (two words)
22. the sum of kinetic energy and gravitational potential energy (two words)
23. a material that is a good conductor of thermal energy (two words)
24. the amount of thermal energy transferred from one object to another (three words)
28. a particle with a positive charge and the same mass as an electron
30. particles in the nucleus of an atom; protons and neutrons
32. the capacity to do work



Work, Energy, Power, and Society

Find the words in the puzzle.

- applying a force to an object that displaces the object in the direction of the force or a component of the force (two words)
- the capacity to do work
- energy possessed by moving objects (two words)
- the net amount of mechanical work done on an object equals the object's change in kinetic energy (two words)
- a form of energy an object possesses because of its position in relation to forces in the environment (two words)
- energy possessed by an object due to its position relative to the surface of Earth (three words)
- a designated level to which objects may fall; considered to have a gravitational potential energy value of 0 J (two words)
- the sum of kinetic energy and gravitational potential energy (two words)
- kinetic energy of randomly moving atoms and molecules (two words)
- potential energy of protons and neutrons in atomic nuclei (two words)
- the change of one type of energy into another (two words)
- energy is neither created nor destroyed; when energy is transformed from one form into another, no energy is lost (five words)
- the amount of useful energy produced in an energy transformation expressed as a percentage of the total amount of energy used
- energy-rich substance (two words)
- a substance that cannot be replenished as it is used in energy-transforming processes (three words)
- a substance with an unlimited supply or a supply that can be replenished as the substance is used in energy-transforming processes (three words)
- fuel produced by the decayed and compressed remains of plants that lived hundreds of millions of years ago (two words)
- the decomposition of large, unstable nuclei into smaller, more stable nuclei (two words)
- the combination of small atomic nuclei to form larger atomic nuclei (two words)
- radiant energy from the sun (two words)
- building design that takes the Sun's radiant energy directly for heating (three words)
- a device that transforms radiant energy into electrical energy (two words)
- electricity produced by transforming the kinetic energy of rushing water into electrical energy
- the rate of transforming energy or doing work
- reduced supply of electricity caused by system damage or excess demand
- a large electricity distribution system composed of a network of electrical power plants and electricity distribution towers and cables (three words)

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

Thermal Energy and Society

Find the words in the puzzle.

- the theory that describes the motion of molecules or atoms in a substance in terms of kinetic energy (three words)
- the total quantity of kinetic and potential energy possessed by the atoms or molecules of a substance (two words)
- a measure of the average kinetic energy of the particles in a substance
- the temperature scale based on the boiling point and freezing point of water (two words)
- the temperature scale based on the boiling point and freezing point of brine (two words)
- the temperature scale developed using absolute zero as the point at which there is virtually no motion in the particles of a substance (two words)
- the temperature at which a solid changes into a liquid; equal to the freezing point for a given substance (two words)
- the temperature at which a liquid changes into a solid; equal to the melting point for a given substance (two words)
- the temperature at which a liquid changes into a gas; equal to the condensation point for a given substance (two words)
- the temperature at which a gas changes into a liquid; equal to the boiling point for a given substance (two words)
- the transfer of thermal energy from a substance with a higher temperature to a substance with a lower temperature
- the transfer of thermal energy that occurs when warmer objects are in physical contact with colder objects (two words)
- the transfer of thermal energy through a fluid that occurs when colder, denser fluid falls and pushes up warmer, less dense fluid
- a current that occurs when a fluid is continuously heated; caused by warmer, less dense fluid being constantly pushed upward as colder, denser fluid falls downward (two words)
- the movement of thermal energy as electromagnetic waves
- a material that is a good conductor of thermal energy (two words)
- the amount of energy, in Joules, required to increase the temperature of 1 kg of a substance by 1 °C (three words)
- the amount of thermal energy transferred from one object to another (three words)
- when thermal energy is transferred from a warmer object to a colder object, the amount of thermal energy released by the warmer object is equal to the amount of thermal energy absorbed by the colder object (five words)
- the expansion of a substance as it warms up (two words)
- the contraction of a substance when it cools down (two words)
- the process by which a solid changes to a liquid
- a graph that shows the temperature changes that occur while thermal energy is absorbed by a substance (two words)
- a graph that shows the temperature changes that occur while thermal energy is removed from a substance (two words)
- the total thermal energy absorbed or released when a substance changes state (two words)
- the amount of thermal energy required to change a solid into a liquid or a liquid into a solid (four words)
- the amount of thermal energy required to change a liquid into a gas or a gas into a liquid (four words)
- the amount of thermal energy required for 1 kg of a substance to change from one state into another (three words)
- the amount of thermal energy required to melt or freeze 1 kg of a substance (five words)
- the amount of thermal energy required to evaporate or condense 1 kg of a substance (five words)
- a system that uses electricity to produce thermal energy for heating (three words)
- a system that moves hot air to heat a building (three words)
- a system that uses hot water to heat a building (four words)
- a system that transfers thermal energy from under Earth's surface into a building to heat it, and transfers thermal energy from the building into the ground to cool the building (two words)

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

Nuclear Energy and Society

Find the words in the puzzle.

- a positively charged particle in the nucleus of an atom
- an uncharged particle in the nucleus of an atom
- particles in the nucleus of an atom; protons and neutrons
- a negatively charged particle found in the space surrounding the nucleus of an atom
- state in which all electrons are at their lowest possible energy levels (two words)
- state in which one or more electrons are at higher energy levels than in the ground state (two words)
- the number of protons in the nucleus (two words)
- the number of protons and neutrons in the nucleus (two words)
- a form of an element that has the same atomic number, but a different mass number than all other forms of that element
- an unstable isotope that spontaneously changes its nuclear structure and releases energy in the form of radiation
- energy released when the nucleus of an unstable isotope undergoes a change in structure
- a process by which the nucleus of an atom spontaneously changes
- the decomposition of large, unstable nuclei into smaller, more stable nuclei (two words)
- the process by which the nucleus of an atom sometimes changes (two words)
- the force of attraction or repulsion due to electric charges (two words)
- the very strong force of attraction between nucleons (three words)
- the process by which a radioactive atom's nucleus breaks apart and forms different atoms (two words)
- nuclear reaction in which an alpha particle is emitted (two words)
- a particle emitted during alpha decay composed of a helium nucleus containing two protons and two neutrons (two words)
- the reactant atom in a nuclear reaction (two words)
- the product atom in a nuclear reaction (two words)
- a nuclear decay process in which daughter atoms are different elements from parent atoms
- nuclear reaction in which a beta particle is emitted or captured (two words)
- a high-energy electron or positron ejected or captured by a nucleus during beta decay (two words)
- a particle with a positive charge and the same mass as an electron
- a high-energy particle with no mass
- a reaction in which an excited nucleus returns to a lower, more stable energy state, releasing a very high-energy gamma ray in the process (two words)
- the average length of time it takes radioactive material to decay to half of its original mass
- a unit of mass equal to 1.66×10^{-27} kg (three words)
- the difference between the calculated mass of an atom, based on the nucleons and electrons present, and the actual atomic mass (two words)
- the energy used to hold a nucleus together (two words)
- the energy required to accelerate an electron through a potential difference of 1 million volts (two words)
- the repeated series of reactions in which the products of one reaction generate subsequent reactions (two words)
- a nuclear reaction in which the nuclei of two atoms fuse together to form a larger nucleus (two words)

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

Energy and Society

Find the words in the puzzle.

- the capacity to do work
- the net amount of mechanical work done on an object equals the object's change in kinetic energy (two words)
- a form of energy an object possesses because of its position in relation to forces in the environment (two words)
- energy possessed by an object due to its position relative to the surface of Earth (three words)
- a designated level to which objects may fall; considered to have a gravitational potential energy value of 0 J (two words)
- the sum of kinetic energy and gravitational potential energy (two words)
- kinetic energy of randomly moving atoms and molecules (two words)
- potential energy of protons and neutrons in atomic nuclei (two words)
- the change of one type of energy into another (two words)
- energy is neither created nor destroyed; when energy is transformed from one form into another, no energy is lost (five words)
- the amount of useful energy produced in an energy transformation expressed as a percentage of the total amount of energy used
- energy-rich substance (two words)
- a substance that cannot be replenished as it is used in energy-transforming processes (three words)
- a substance with an unlimited supply or a supply that can be replenished as the substance is used in energy-transforming processes (three words)
- fuel produced by the decayed and compressed remains of plants that lived hundreds of millions of years ago (two words)
- the decomposition of large, unstable nuclei into smaller, more stable nuclei (two words)
- the combination of small atomic nuclei to form larger atomic nuclei (two words)
- building design that takes the Sun's radiant energy directly for heating (three words)
- a device that transforms radiant energy into electrical energy (two words)
- electricity produced by transforming the kinetic energy of rushing water into electrical energy
- the rate of transforming energy or doing work
- reduced supply of electricity caused by system damage or excess demand
- a large electricity distribution system composed of a network of electrical power plants and electricity distribution towers and cables (three words)
- the theory that describes the motion of molecules or atoms in a substance in terms of kinetic energy (three words)
- the total quantity of kinetic and potential energy possessed by the atoms or molecules of a substance (two words)
- a measure of the average kinetic energy of the particles in a substance
- the temperature at which a solid changes into a liquid; equal to the freezing point for a given substance (two words)
- the temperature at which a gas changes into a liquid; equal to the boiling point for a given substance (two words)
- the transfer of thermal energy from a substance with a higher temperature to a substance with a lower temperature
- the transfer of thermal energy that occurs when warmer objects are in physical contact with colder objects (two words)
- the transfer of thermal energy through a fluid that occurs when colder, denser fluid falls and pushes up warmer, less dense fluid
- a current that occurs when a fluid is continuously heated; caused by warmer, less dense fluid being constantly pushed upward as colder, denser fluid falls downward (two words)
- the movement of thermal energy as electromagnetic waves
- a material that is a good conductor of thermal energy (two words)
- the amount of energy, in Joules, required to increase the temperature of 1 kg of a substance by 1 °C (three words)
- when thermal energy is transferred from a warmer object to a colder object, the amount of thermal energy released by the warmer object is equal to the amount of thermal energy absorbed by the colder object (five words)
- the expansion of a substance as it warms up (two words)
- the contraction of a substance when it cools down (two words)
- the process by which a solid changes to a liquid
- a graph that shows the temperature changes that occur while thermal energy is absorbed by a substance (two words)
- the total thermal energy absorbed or released when a substance changes state (two words)
- the amount of thermal energy required to change a solid into a liquid or a liquid into a solid (four words)
- the amount of thermal energy required to change a liquid into a gas or a gas into a liquid (four words)
- the amount of thermal energy required for 1 kg of a substance to change from one state into another (three words)
- the amount of thermal energy required to melt or freeze 1 kg of a substance (five words)
- the amount of thermal energy required to evaporate or condense 1 kg of a substance (five words)
- a system that uses electricity to produce thermal energy for heating (three words)
- a system that moves hot air to heat a building (three words)
- a system that uses hot water to heat a building (four words)
- a system that transfers thermal energy from under Earth's surface into a building to heat it, and transfers thermal energy from the building into the ground to cool the building (two words)
- a positively charged particle in the nucleus of an atom
- particles in the nucleus of an atom; protons and neutrons
- a negatively charged particle found in the space surrounding the nucleus of an atom
- state in which all electrons are at their lowest possible energy levels (two words)
- a form of an element that has the same atomic number, but a different mass number than all other forms of that element
- energy released when the nucleus of an unstable isotope undergoes a change in structure
- a process by which the nucleus of an atom spontaneously changes
- the decomposition of large, unstable nuclei into smaller, more stable nuclei (two words)
- the force of attraction or repulsion due to electric charges (two words)
- the very strong force of attraction between nucleons (three words)
- the process by which a radioactive atom's nucleus breaks apart and forms different atoms (two words)
- nuclear reaction in which an alpha particle is emitted (two words)
- a particle emitted during alpha decay composed of a helium nucleus containing two protons and two neutrons (two words)
- a high-energy electron or positron ejected or captured by a nucleus during beta decay (two words)
- a high-energy particle with no mass
- the average length of time it takes radioactive material to decay to half of its original mass
- the energy required to accelerate an electron through a potential difference of 1 million volts (two words)
- the repeated series of reactions in which the products of one reaction generate subsequent reactions (two words)
- a nuclear reaction in which the nuclei of two atoms fuse together to form a larger nucleus (two words)

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

Vibrations and Waves

Complete the crossword puzzle.

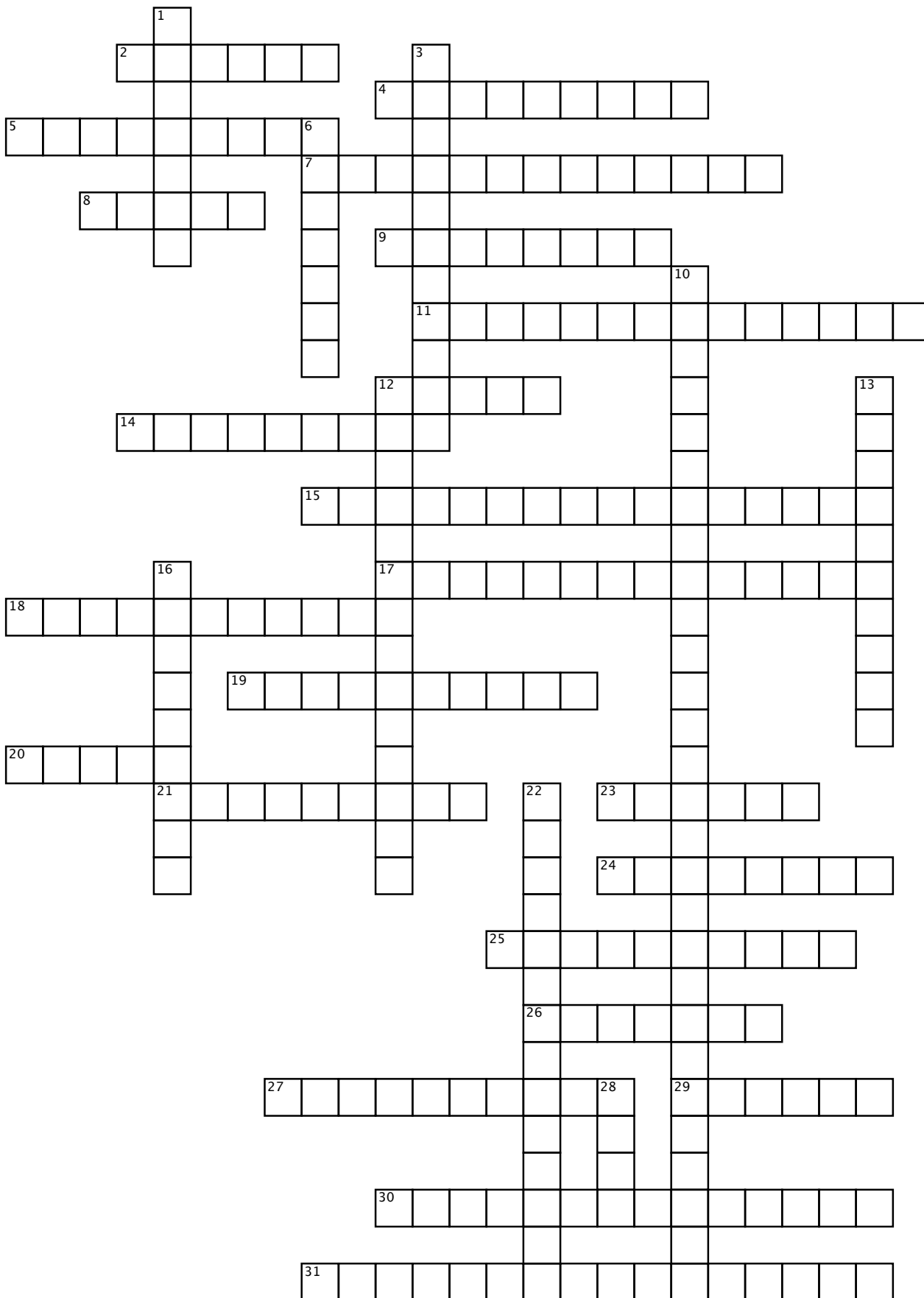
Across

2. the time for a vibrating particle to complete one cycle
4. the rate at which a wave is travelling through a medium; also a measure of how fast the energy of a wave is moving (two words)
5. the maximum displacement of a wave from its equilibrium point
7. the mass per unit distance of a string; units are kilograms per metre (kg/m) (two words)
8. the maximum point of a transverse wave
9. the shape of a wave when graphed
11. a wave in which particles vibrate perpendicular to the direction of the flow of energy (two words)
12. a form of energy produced by rapidly vibrating objects detectable by sensory organs such as the ear
14. the cyclical motion of an object about an equilibrium point
15. a wave in which particles vibrate parallel to the direction of the flow of energy (two words)
17. sound wave with a frequency below 20 Hz (two words)
18. the region in a longitudinal wave in which the medium's particles are closer together
19. a shift of an entire wave along the x-axis with respect to an otherwise identical wave (two words)
20. in a continuous transverse or longitudinal wave, the x-coordinate of a unique point of the wave
21. the displacement of a particle over a certain time interval; the difference between the particle's initial and final positions (two words)
23. the minimum point of a transverse wave

24. the force per unit area
25. the ratio of the airspeed of an object to the local speed of sound (two words)
26. the state of two identical waves that have the same phase shift (two words)
27. the state of two identical waves that have different phase shifts (three words)
29. the material that permits the transmission of energy through vibrations
30. sound wave with a frequency above 20 kHz (two words)
31. sound wave in the range of human hearing, 20 Hz to 20 kHz (three words)

Down

1. the unit of sound level used to describe sound intensity level
3. the region in a longitudinal wave in which the medium's particles are farther apart
6. the property of a medium that returns to its original shape after being disturbed
10. the straight-line motion of a molecule; this motion is typical of gases because the particles in liquids and solids are not free to move in this manner (three words)
12. the amount of sound energy being transferred per unit area (two words)
13. the distance between two similar points in successive identical cycles in a wave, such as from crest to crest or trough to trough
16. the number of complete cycles that occur in unit time, usually 1 s; measured in Hertz (Hz)
22. the transfer of energy through a material due to vibration (two words)
28. the sound energy reflected off a surface back to the producer of the sound



Wave Interactions

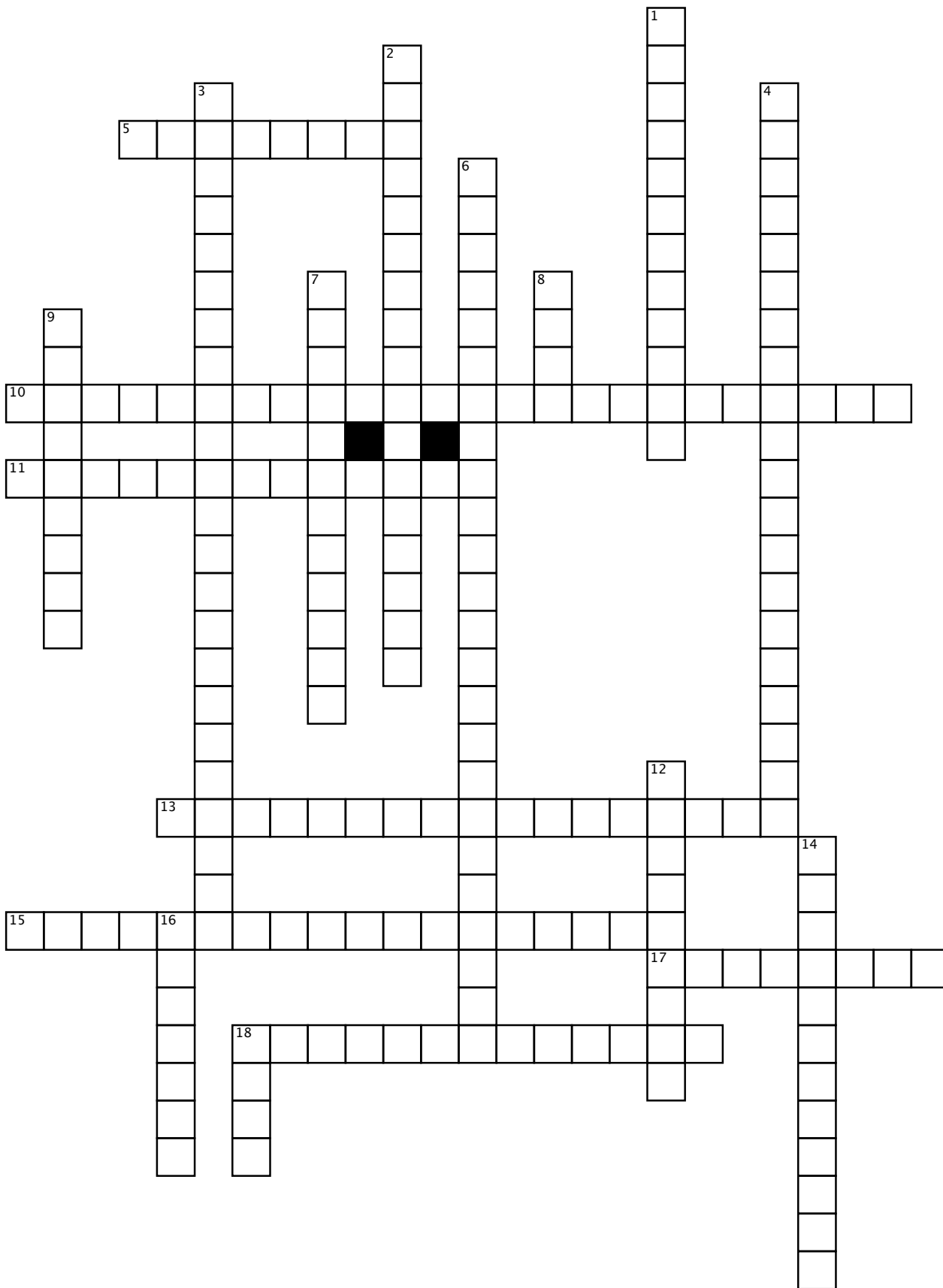
Complete the crossword puzzle.

Across

5. a sound resulting from a string that vibrates with more than one frequency
10. at any point the amplitude of two interfering waves with the sum of the amplitudes of the individual waves (three words)
11. when a source of sound approaches an observer, the observed frequency of the sound increases; when the source moves away from an observer, the observed frequency of the sound decreases (two words)
13. the frequency at which a medium vibrates most easily (two words)
15. a reflection that occurs at a media boundary where one end of the medium is unable to vibrate; reflections are inverted (two words)
17. in a standing wave, the location where the particles of the medium are moving with greatest speed; the amplitude will be twice the amplitude of the original wave
18. the frequency of beats produced by the interference of two waves with slightly different frequencies; equal to the difference in the frequencies of the interfering waves (two words)
3. the process of forming a wave with a smaller amplitude when two or more waves combine (two words)
4. the lowest frequency that can produce a standing wave in a given medium (two words)
6. the process of forming a wave with a larger amplitude when two or more waves combine (two words)
7. the process of generating a new wave when two or more waves meet
8. in a standing wave, the location where the particles of the medium are at rest
9. whole-number multiples of the fundamental frequency
12. the condition in which the frequency of a wave equals the resonant frequency of the wave's medium
14. an interference pattern produced when incoming and reflected waves interfere with each other; the effect is a wave pattern that appears stationary (two words)
16. a reduction in the amplitude of a wave as a result of energy absorption or destructive interference
18. periodic change in sound intensity caused by the interference between two nearly identical sound waves

Down

1. the motion of a wave through a medium, or motion of a wave from one medium to another medium
2. a reflection that occurs at a media boundary where the second medium is less dense than the first medium; reflections have an amplitude with the same orientation as the original wave (two words)



Applications of Waves

Complete the crossword puzzle.

Across

4. sound that originates from a combination of musical notes that originate from a source that vibrates in a uniform manner with one or more constant frequencies
7. the time required for the loudness of the sound to drop by 60 dB or until the sound is inaudible (two words)
10. sound that originates from a source that vibrates in a random manner
13. the transfer of energy from one object to another, causing large-amplitude vibrations when the second object has the same resonant frequency as the first (two words)

Down

1. an enormous sea wave or a series of enormous sea waves caused by an earthquake or other disturbance
2. the total effect of sound produced in an enclosed or restricted space (two words)
3. waves of energy that travel through Earth (two words)
5. the response to a vibration with the same resonant frequency (two words)
6. the response when the energy added to a structure vibrating in air exceeds the energy lost due to damping, causing large vibrations (two words)
8. an object, usually a hollow chamber called a case box or a sounding board, that vibrates in resonance with the source of sound
9. the general perception of highness or lowness of a sound; depends on the frequency, complexity, and loudness of the sound
11. the pleasantness of a sound; related to the waveform of the sound
12. the location of objects through the analysis of echoes, or reflected sound



Waves and Sound

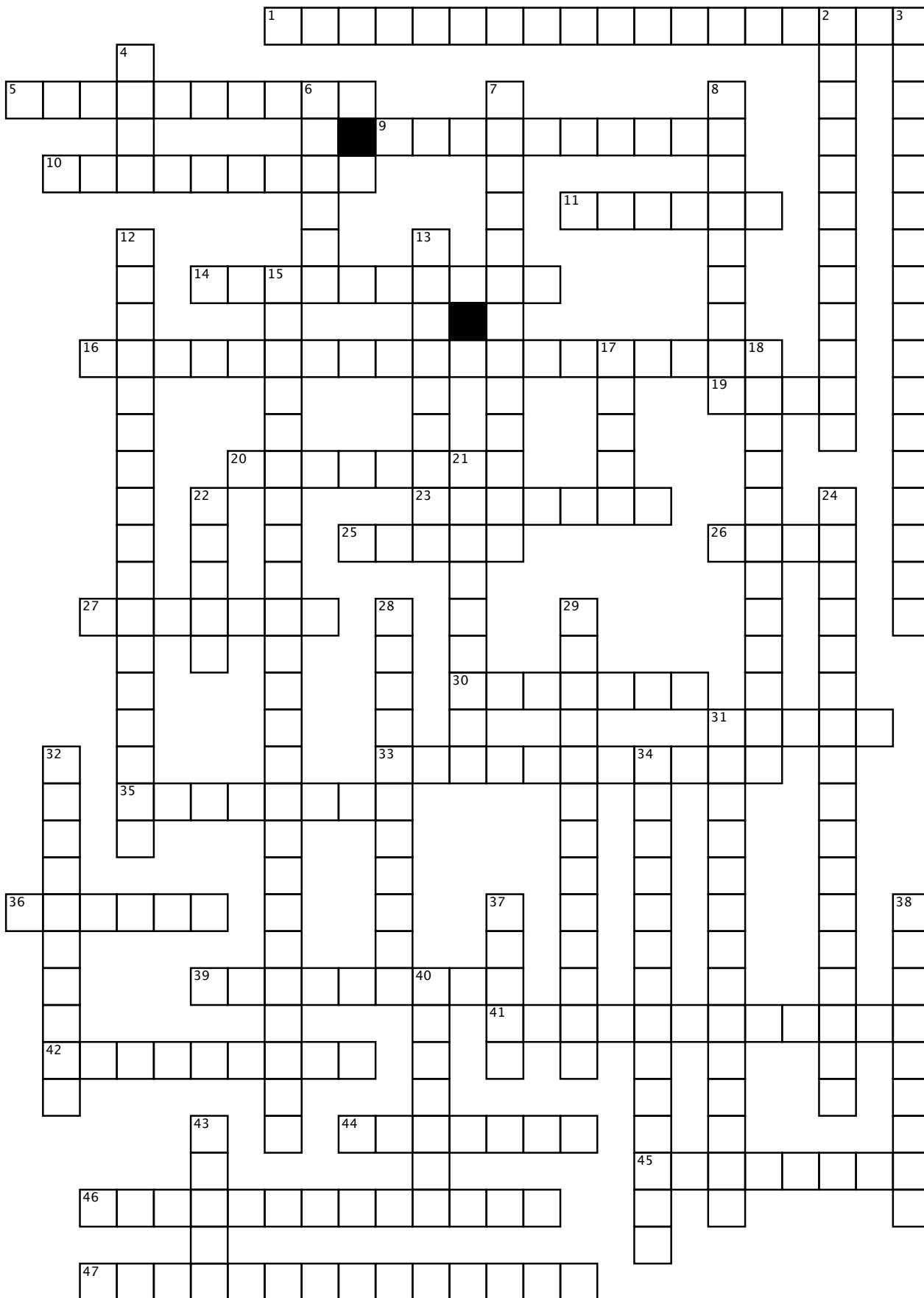
Complete the crossword puzzle.

Across

1. the response when the energy added to a structure vibrating in air exceeds the energy lost due to damping, causing large vibrations (two words)
5. the distance between two similar points in successive identical cycles in a wave, such as from crest to crest or trough to trough
9. the state of two identical waves that have different phase shifts (three words)
10. the displacement of a particle over a certain time interval; the difference between the particle's initial and final positions (two words)
11. the time for a vibrating particle to complete one cycle
14. the ratio of the airspeed of an object to the local speed of sound (two words)
16. the transfer of energy from one object to another, causing large-amplitude vibrations when the second object has the same resonant frequency as the first (two words)
19. the sound energy reflected off a surface back to the producer of the sound
20. the force per unit area
23. the unit of sound level used to describe sound intensity level
25. the maximum point of a transverse wave
26. in a standing wave, the location where the particles of the medium are at rest
27. the property of a medium that returns to its original shape after being disturbed
30. an enormous sea wave or a series of enormous sea waves caused by an earthquake or other disturbance
31. a form of energy produced by rapidly vibrating objects detectable by sensory organs such as the ear
33. the region in a longitudinal wave in which the medium's particles are farther apart
35. a sound resulting from a string that vibrates with more than one frequency
36. the material that permits the transmission of energy through vibrations
39. whole-number multiples of the fundamental frequency
41. the process of generating a new wave when two or more waves meet
42. the number of complete cycles that occur in unit time, usually 1 s; measured in Hertz (Hz)
44. the pleasantness of a sound; related to the waveform of the sound
45. in a standing wave, the location where the particles of the medium are moving with greatest speed; the amplitude will be twice the amplitude of the original wave
46. the frequency of beats produced by the interference of two waves with slightly different frequencies; equal to the difference in the frequencies of the interfering waves (two words)
47. the transfer of energy through a material due to vibration (two words)

Down

2. the motion of a wave through a medium, or motion of a wave from one medium to another medium
3. the time required for the loudness of the sound to drop by 60 dB or until the sound is inaudible (two words)
4. periodic change in sound intensity caused by the interference between two nearly identical sound waves
6. the minimum point of a transverse wave
7. when a source of sound approaches an observer, the observed frequency of the sound increases; when the source moves away from an observer, the observed frequency of the sound decreases (two words)
8. the condition in which the frequency of a wave equals the resonant frequency of the wave's medium
12. a reflection that occurs at a media boundary where the second medium is less dense than the first medium; reflections have an amplitude with the same orientation as the original wave (two words)
13. the maximum displacement of a wave from its equilibrium point
15. the process of forming a wave with a larger amplitude when two or more waves combine (two words)
17. sound that originates from a source that vibrates in a random manner
18. the location of objects through the analysis of echoes, or reflected sound
21. an object, usually a hollow chamber called a case box or a sounding board, that vibrates in resonance with the source of sound
22. in a continuous transverse or longitudinal wave, the x-coordinate of a unique point of the wave
24. the frequency at which a medium vibrates most easily (two words)
28. the region in a longitudinal wave in which the medium's particles are closer together
29. the mass per unit distance of a string; units are kilograms per metre (kg/m) (two words)
31. the amount of sound energy being transferred per unit area (two words)
32. a shift of an entire wave along the x-axis with respect to an otherwise identical wave (two words)
34. a wave in which particles vibrate perpendicular to the direction of the flow of energy (two words)
37. sound that originates from a combination of musical notes that originate from a source that vibrates in a uniform manner with one or more constant frequencies
38. the rate at which a wave is travelling through a medium; also a measure of how fast the energy of a wave is moving (two words)
40. the state of two identical waves that have the same phase shift (two words)
43. the general perception of highness or lowness of a sound; depends on the frequency, complexity, and loudness of the sound



Vibrations and Waves

Find the words in the puzzle.

- the cyclical motion of an object about an equilibrium point
- the transfer of energy through a material due to vibration (two words)
- the material that permits the transmission of energy through vibrations
- the displacement of a particle over a certain time interval; the difference between the particle's initial and final positions (two words)
- the property of a medium that returns to its original shape after being disturbed
- the straight-line motion of a molecule; this motion is typical of gases because the particles in liquids and solids are not free to move in this manner (three words)
- a wave in which particles vibrate perpendicular to the direction of the flow of energy (two words)
- a wave in which particles vibrate parallel to the direction of the flow of energy (two words)
- the region in a longitudinal wave in which the medium's particles are closer together
- the region in a longitudinal wave in which the medium's particles are farther apart
- a form of energy produced by rapidly vibrating objects detectable by sensory organs such as the ear
- the maximum displacement of a wave from its equilibrium point
- the shape of a wave when graphed
- the maximum point of a transverse wave
- the minimum point of a transverse wave
- the distance between two similar points in successive identical cycles in a wave, such as from crest to crest or trough to trough
- in a continuous transverse or longitudinal wave, the x-coordinate of a unique point of the wave
- a shift of an entire wave along the x-axis with respect to an otherwise identical wave (two words)
- the state of two identical waves that have the same phase shift (two words)
- the state of two identical waves that have different phase shifts (three words)
- the number of complete cycles that occur in unit time, usually 1 s; measured in Hertz (Hz)
- the time for a vibrating particle to complete one cycle
- the rate at which a wave is travelling through a medium; also a measure of how fast the energy of a wave is moving (two words)
- the mass per unit distance of a string; units are kilograms per metre (kg/m) (two words)
- sound wave in the range of human hearing, 20 Hz to 20 kHz (three words)
- sound wave with a frequency below 20 Hz (two words)
- sound wave with a frequency above 20 kHz (two words)
- the sound energy reflected off a surface back to the producer of the sound
- the ratio of the airspeed of an object to the local speed of sound (two words)
- the force per unit area
- the amount of sound energy being transferred per unit area (two words)
- the unit of sound level used to describe sound intensity level

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

Wave Interactions

Find the words in the puzzle.

- the process of generating a new wave when two or more waves meet
- at any point the amplitude of two interfering waves with the sum of the amplitudes of the individual waves (three words)
- the process of forming a wave with a larger amplitude when two or more waves combine (two words)
- the process of forming a wave with a smaller amplitude when two or more waves combine (two words)
- a reflection that occurs at a media boundary where the second medium is less dense than the first medium; reflections have an amplitude with the same orientation as the original wave (two words)
- a reflection that occurs at a media boundary where one end of the medium is unable to vibrate; reflections are inverted (two words)
- the motion of a wave through a medium, or motion of a wave from one medium to another medium
- an interference pattern produced when incoming and reflected waves interfere with each other; the effect is a wave pattern that appears stationary (two words)
- in a standing wave, the location where the particles of the medium are at rest
- in a standing wave, the location where the particles of the medium are moving with greatest speed; the amplitude will be twice the amplitude of the original wave
- the lowest frequency that can produce a standing wave in a given medium (two words)
- whole-number multiples of the fundamental frequency
- a sound resulting from a string that vibrates with more than one frequency
- periodic change in sound intensity caused by the interference between two nearly identical sound waves
- the frequency of beats produced by the interference of two waves with slightly different frequencies; equal to the difference in the frequencies of the interfering waves (two words)
- a reduction in the amplitude of a wave as a result of energy absorption or destructive interference
- the frequency at which a medium vibrates most easily (two words)
- the condition in which the frequency of a wave equals the resonant frequency of the wave's medium
- when a source of sound approaches an observer, the observed frequency of the sound increases; when the source moves away from an observer, the observed frequency of the sound decreases (two words)

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

Applications of Waves

Find the words in the puzzle.

- sound that originates from a combination of musical notes that originate from a source that vibrates in a uniform manner with one or more constant frequencies
- sound that originates from a source that vibrates in a random manner
- the general perception of highness or lowness of a sound; depends on the frequency, complexity, and loudness of the sound
- the pleasantness of a sound; related to the waveform of the sound
- an object, usually a hollow chamber called a case box or a sounding board, that vibrates in resonance with the source of sound
- the total effect of sound produced in an enclosed or restricted space (two words)
- the time required for the loudness of the sound to drop by 60 dB or until the sound is inaudible (two words)
- the transfer of energy from one object to another, causing large-amplitude vibrations when the second object has the same resonant frequency as the first (two words)
- the response to a vibration with the same resonant frequency (two words)
- the response when the energy added to a structure vibrating in air exceeds the energy lost due to damping, causing large vibrations (two words)
- an enormous sea wave or a series of enormous sea waves caused by an earthquake or other disturbance
- waves of energy that travel through Earth (two words)
- the location of objects through the analysis of echoes, or reflected sound

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

Waves and Sound

Find the words in the puzzle.

- the cyclical motion of an object about an equilibrium point
- the transfer of energy through a material due to vibration (two words)
- the material that permits the transmission of energy through vibrations
- the displacement of a particle over a certain time interval; the difference between the particle's initial and final positions (two words)
- the property of a medium that returns to its original shape after being disturbed
- the straight-line motion of a molecule; this motion is typical of gases because the particles in liquids and solids are not free to move in this manner (three words)
- a wave in which particles vibrate perpendicular to the direction of the flow of energy (two words)
- a wave in which particles vibrate parallel to the direction of the flow of energy (two words)
- the region in a longitudinal wave in which the medium's particles are closer together
- the region in a longitudinal wave in which the medium's particles are farther apart
- a form of energy produced by rapidly vibrating objects detectable by sensory organs such as the ear
- the maximum displacement of a wave from its equilibrium point
- the shape of a wave when graphed
- the maximum point of a transverse wave
- the minimum point of a transverse wave
- the distance between two similar points in successive identical cycles in a wave, such as from crest to crest or trough to trough
- in a continuous transverse or longitudinal wave, the x-coordinate of a unique point of the wave
- a shift of an entire wave along the x-axis with respect to an otherwise identical wave (two words)
- the state of two identical waves that have the same phase shift (two words)
- the state of two identical waves that have different phase shifts (three words)
- the number of complete cycles that occur in unit time, usually 1 s; measured in Hertz (Hz)
- the time for a vibrating particle to complete one cycle
- the rate at which a wave is travelling through a medium; also a measure of how fast the energy of a wave is moving (two words)
- the mass per unit distance of a string; units are kilograms per metre (kg/m) (two words)
- sound wave in the range of human hearing, 20 Hz to 20 kHz (three words)
- sound wave with a frequency below 20 Hz (two words)
- sound wave with a frequency above 20 kHz (two words)
- the sound energy reflected off a surface back to the producer of the sound
- the ratio of the airspeed of an object to the local speed of sound (two words)
- the force per unit area
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- the response when the energy added to a structure vibrating in air exceeds the energy lost due to damping, causing large vibrations (two words)
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- waves of energy that travel through Earth (two words)
- the location of objects through the analysis of echoes, or reflected sound

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

Electricity and Its Production

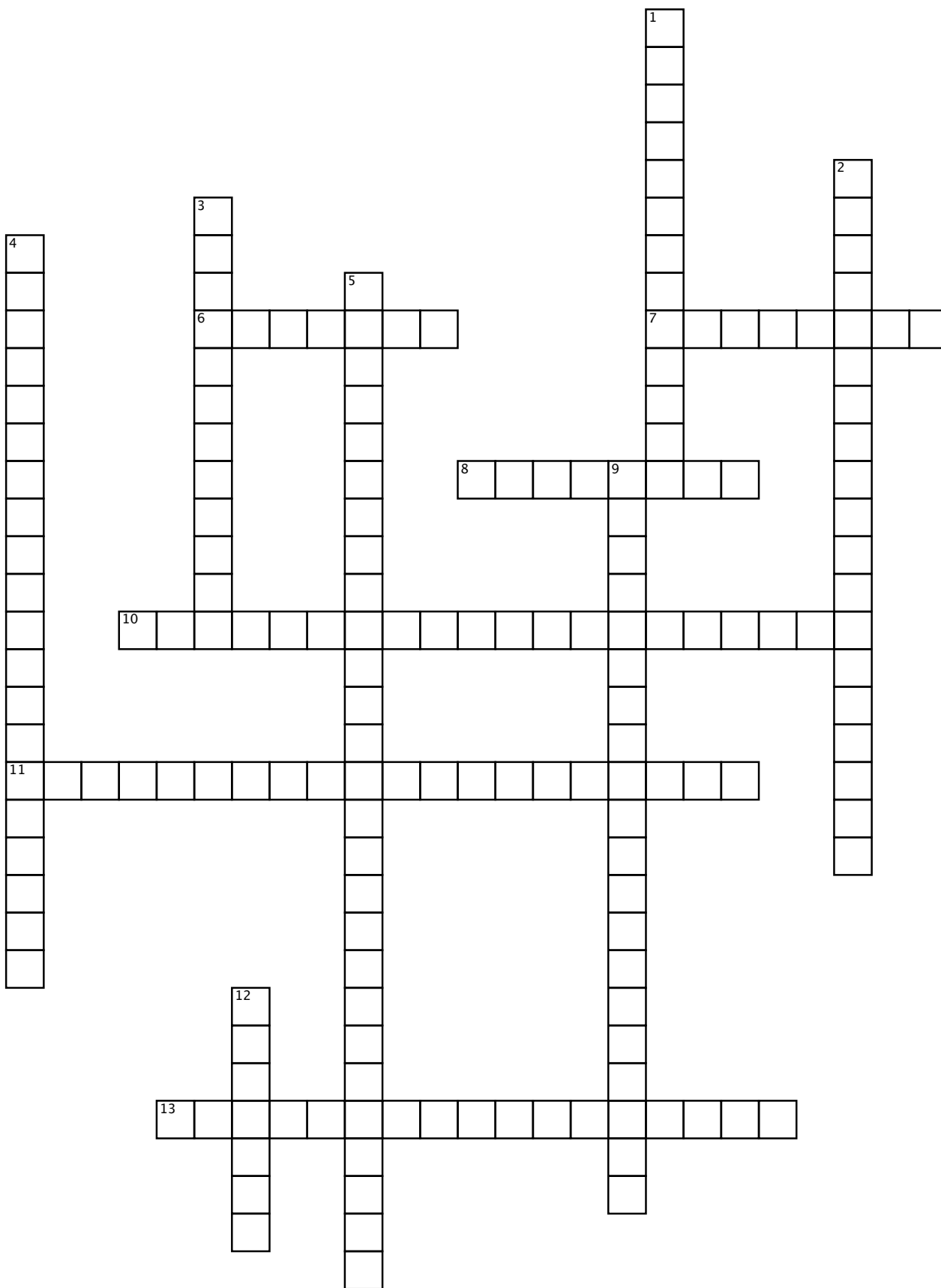
Complete the crossword puzzle.

Across

6. the potential difference between any two points in a conductor varies directly with the current between two points if the temperature remains constant (two words)
7. an electrical device that has a specific resistance value
8. a device that measures electrical resistance
10. in any complete path in an electric circuit, the total electric potential increase at the source(s) is equal to the total electric potential decrease throughout the rest of the circuit (three words)
11. the total resistance of a group of resistors connected in series or parallel (two words)
13. the amount of electric potential energy associated with charges (two words)

Down

1. the movement of electrons in only one direction (two words)
2. the rate of transformation of electrical energy (three words)
3. measure of electrical energy (two words)
4. in a closed circuit, the amount of current entering a junction is equal to the amount of current exiting a junction (three words)
5. the change in electric potential energy associated with charges at two different points in a circuit (three words)
9. a property of matter that describes how difficult it is for electric current to travel through a material (two words)
12. electrical device that measures electric current; must be connected to the circuit in series



Electromagnetism

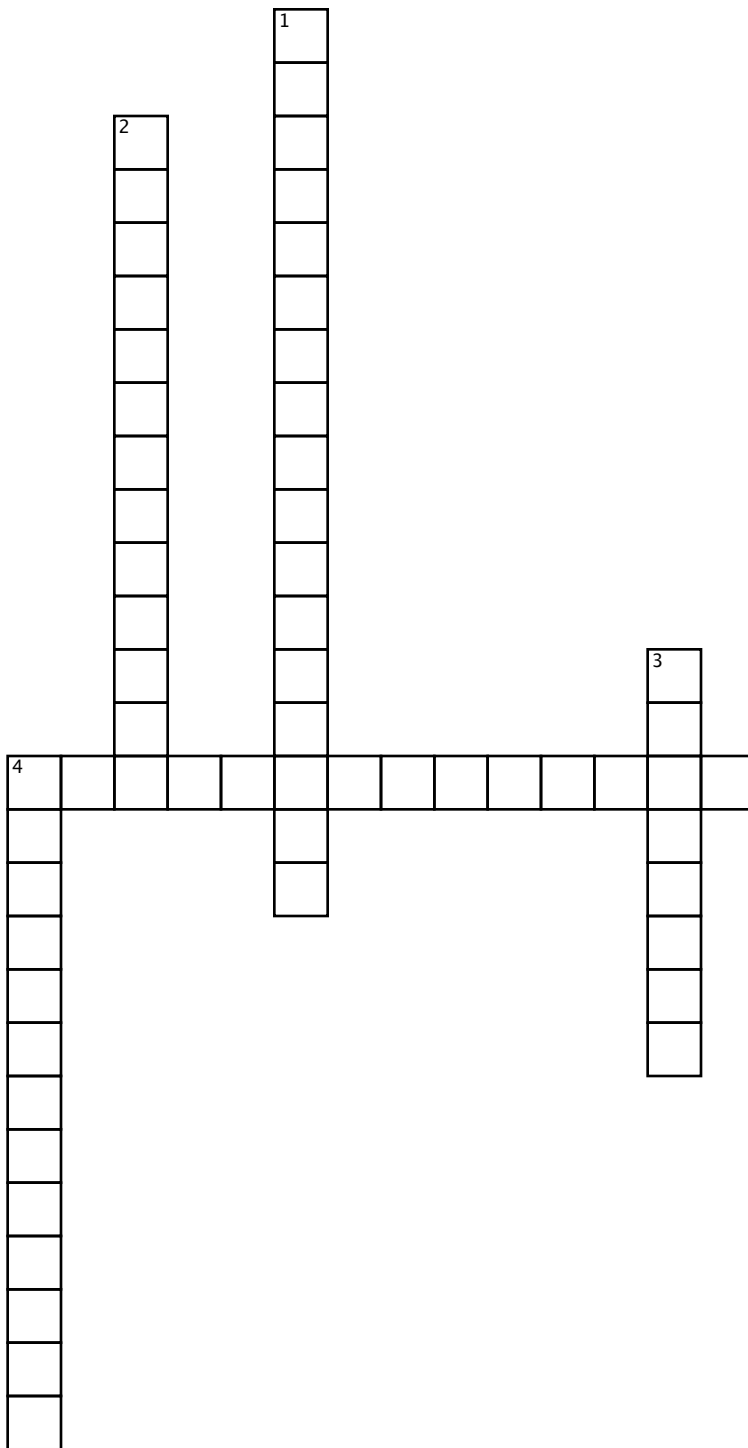
Complete the crossword puzzle.

Across

4. a current-carrying conductor that cuts across external magnetic field lines experiences a force perpendicular to both the magnetic field and the direction of the electric current (two words)

Down

1. whenever a charge moves through a straight conductor, a circular magnetic field is created around the conductor (two words)
2. any device that produces a magnetic field as a result of an electric current
3. a coiled conductor
4. a region of space around a magnet that causes a magnetic force on magnetic objects (two words)



Electromagnetic Induction

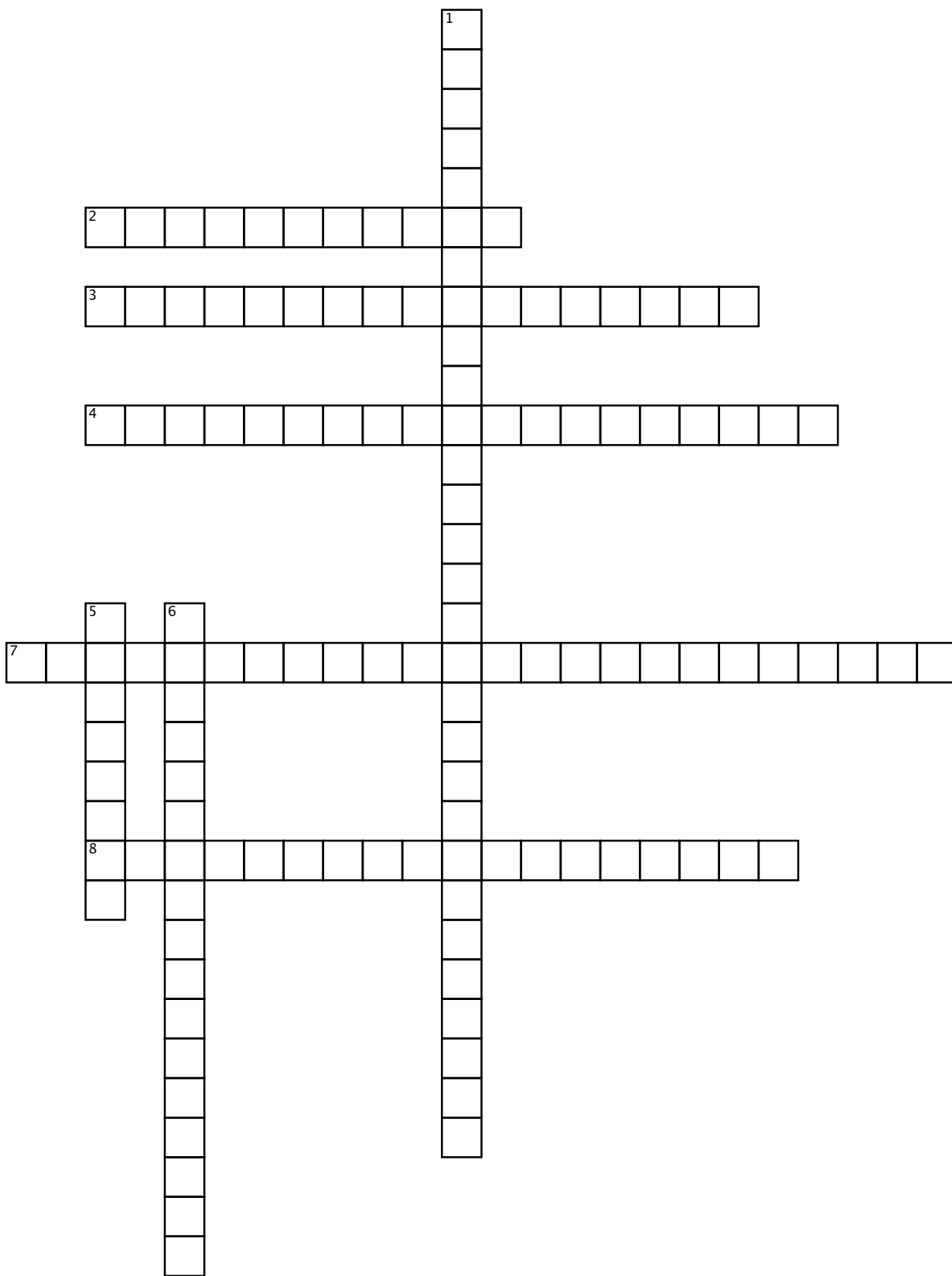
Complete the crossword puzzle.

Across

2. an electromagnetic device that can raise or lower voltage
3. a device that transforms other forms of energy into electrical energy (two words)
4. a transformer with fewer secondary windings than primary windings (two words)
7. the production of electric current in a conductor moving through a magnetic field (two words)
8. an electric current that periodically reverses direction (two words)

Down

1. a change in the magnetic field in the region of a conductor induces a voltage in the conductor, causing an induced electric current in the conductor (four words)
5. if a changing magnetic field induces a current in a coil, the electric current is in such a direction that its own magnetic field opposes the change that produced it (two words)
6. a transformer with more secondary windings than primary windings (two words)



Electricity and Magnetism

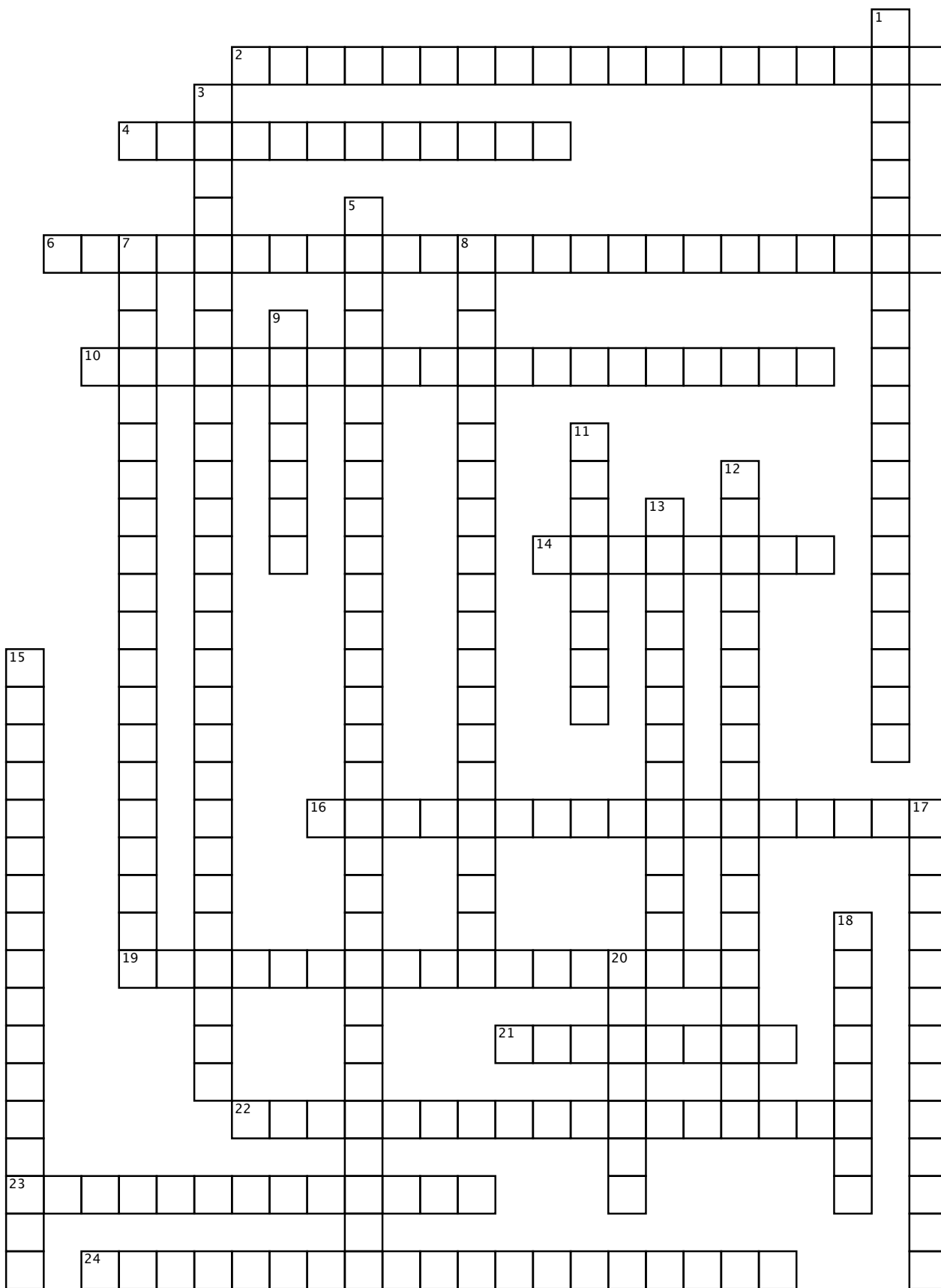
Complete the crossword puzzle.

Across

2. the rate of transformation of electrical energy (three words)
4. measure of electrical energy (two words)
6. the production of electric current in a conductor moving through a magnetic field (two words)
10. in a closed circuit, the amount of current entering a junction is equal to the amount of current exiting a junction (three words)
14. an electrical device that has a specific resistance value
16. whenever a charge moves through a straight conductor, a circular magnetic field is created around the conductor (two words)
19. a device that transforms other forms of energy into electrical energy (two words)
21. a device that measures electrical resistance
22. the amount of electric potential energy associated with charges (two words)
23. a region of space around a magnet that causes a magnetic force on magnetic objects (two words)
24. a transformer with fewer secondary windings than primary windings (two words)
3. the change in electric potential energy associated with charges at two different points in a circuit (three words)
5. a change in the magnetic field in the region of a conductor induces a voltage in the conductor, causing an induced electric current in the conductor (four words)
7. the total resistance of a group of resistors connected in series or parallel (two words)
8. a property of matter that describes how difficult it is for electric current to travel through a material (two words)
9. the potential difference between any two points in a conductor varies directly with the current between two points if the temperature remains constant (two words)
11. a coiled conductor
12. an electric current that periodically reverses direction (two words)
13. the movement of electrons in only one direction (two words)
15. a transformer with more secondary windings than primary windings (two words)
17. any device that produces a magnetic field as a result of an electric current

Down

1. in any complete path in an electric circuit, the total electric potential increase at the source(s) is equal to the total electric potential decrease throughout the rest of the circuit (three words)
18. if a changing magnetic field induces a current in a coil, the electric current is in such a direction that its own magnetic field opposes the change that produced it (two words)
20. electrical device that measures electric current; must be connected to the circuit in series



Electricity and Its Production

Find the words in the puzzle.

- the rate of transformation of electrical energy (three words)
- measure of electrical energy (two words) 3. the amount of electric potential energy associated with charges (two words)
- the change in electric potential energy associated with charges at two different points in a circuit (three words)
- the movement of electrons in only one direction (two words)
- electrical device that measures electric current; must be connected to the circuit in series
- in any complete path in an electric circuit, the total electric potential increase at the source (s) is equal to the total electric potential decrease throughout the rest of the circuit (three words)
- in a closed circuit, the amount of current entering a junction is equal to the amount of current exiting a junction (three words)
- a property of matter that describes how difficult it is for electric current to travel through a material (two words)
- an electrical device that has a specific resistance value
- the potential difference between any two points in a conductor varies directly with the current between two points if the temperature remains constant (two words)
- a device that measures electrical resistance
- the total resistance of a group of resistors connected in series or parallel (two words)

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

Electromagnetism

Find the words in the puzzle.

- a region of space around a magnet that causes a magnetic force on magnetic objects (two words)
- whenever a charge moves through a straight conductor, a circular magnetic field is created around the conductor (two words)
- a coiled conductor
- any device that produces a magnetic field as a result of an electric current
- a current-carrying conductor that cuts across external magnetic field lines experiences a force perpendicular to both the magnetic field and the direction of the electric current (two words)

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

Electromagnetic Induction

Find the words in the puzzle.

- the production of electric current in a conductor moving through a magnetic field (two words)
- a change in the magnetic field in the region of a conductor induces a voltage in the conductor, causing an induced electric current in the conductor (four words)
- if a changing magnetic field induces a current in a coil, the electric current is in such a direction that its own magnetic field opposes the change that produced it (two words)
- an electric current that periodically reverses direction (two words)
- a device that transforms other forms of energy into electrical energy (two words)
- an electromagnetic device that can raise or lower voltage
- a transformer with fewer secondary windings than primary windings (two words)
- a transformer with more secondary windings than primary windings (two words)

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

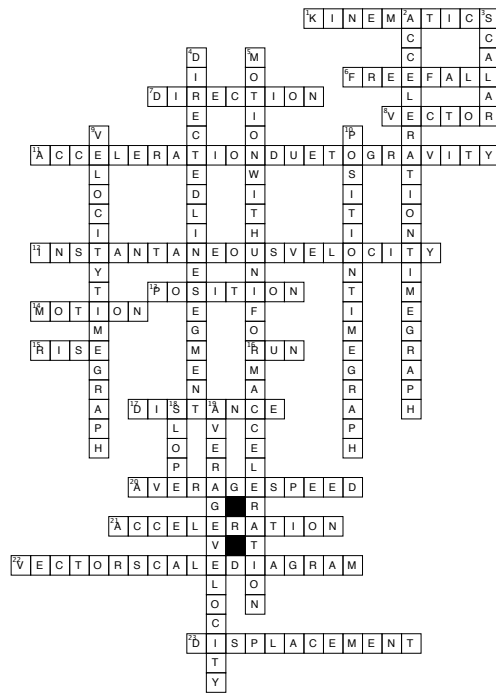
Electricity and Magnetism

Find the words in the puzzle.

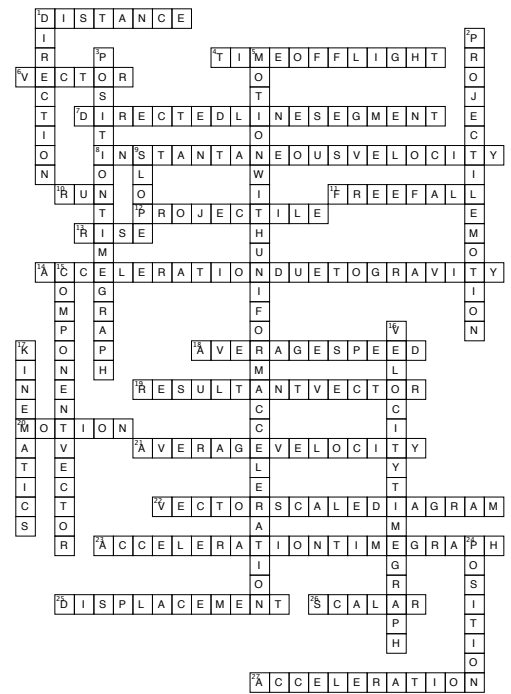
- the rate of transformation of electrical energy (three words)
- measure of electrical energy (two words)
- the amount of electric potential energy associated with charges (two words)
- the change in electric potential energy associated with charges at two different points in a circuit (three words)
- the movement of electrons in only one direction (two words)
- electrical device that measures electric current; must be connected to the circuit in series
- in any complete path in an electric circuit, the total electric potential increase at the source(s) is equal to the total electric potential decrease throughout the rest of the circuit (three words)
- in a closed circuit, the amount of current entering a junction is equal to the amount of current exiting a junction (three words)
- a property of matter that describes how difficult it is for electric current to travel through a material (two words)
- an electrical device that has a specific resistance value
- the potential difference between any two points in a conductor varies directly with the current between two points if the temperature remains constant (two words)
- a device that measures electrical resistance
- the total resistance of a group of resistors connected in series or parallel (two words)
- a region of space around a magnet that causes a magnetic force on magnetic objects (two words)
- whenever a charge moves through a straight conductor, a circular magnetic field is created around the conductor (two words)
- a coiled conductor
- any device that produces a magnetic field as a result of an electric current
- a current-carrying conductor that cuts across external magnetic field lines experiences a force perpendicular to both the magnetic field and the direction of the electric current (two words)
- the production of electric current in a conductor moving through a magnetic field (two words)
- a change in the magnetic field in the region of a conductor induces a voltage in the conductor, causing an induced electric current in the conductor (four words)
- if a changing magnetic field induces a current in a coil, the electric current is in such a direction that its own magnetic field opposes the change that produced it (two words)
- an electric current that periodically reverses direction (two words)
- a device that transforms other forms of energy into electrical energy (two words)
- an electromagnetic device that can raise or lower voltage
- a transformer with fewer secondary windings than primary windings (two words)
- a transformer with more secondary windings than primary windings (two words)

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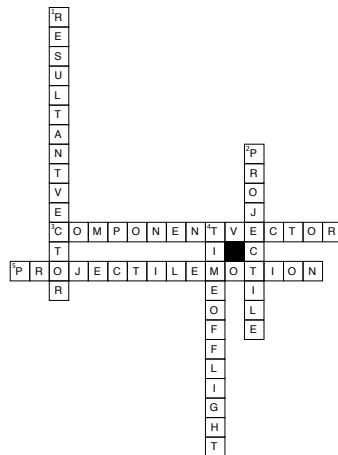
Motion in a Straight Line



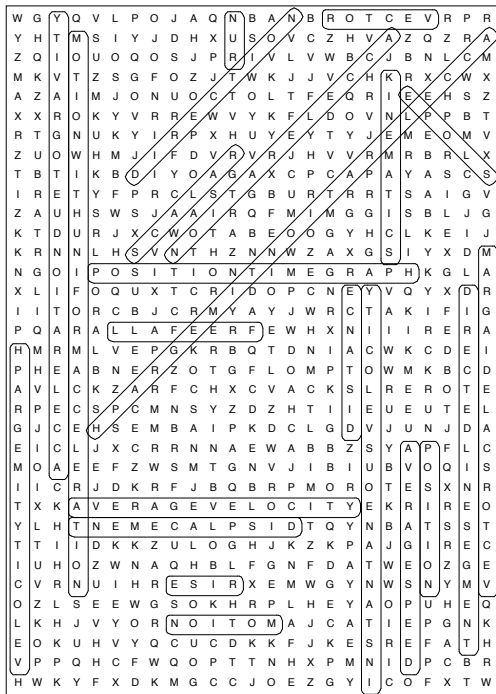
Kinematics



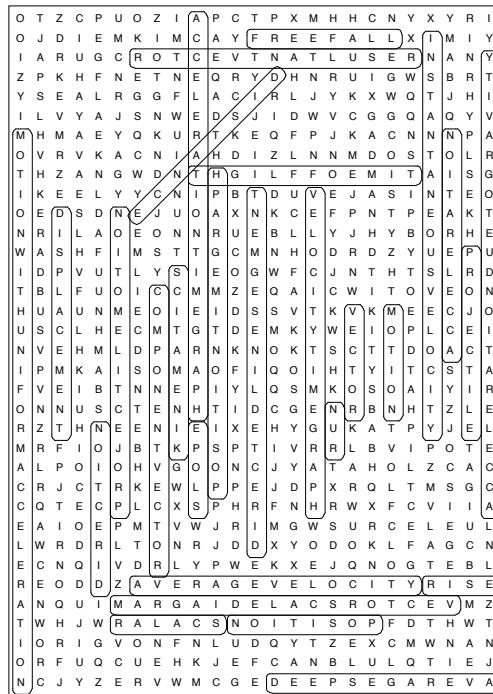
Motion in Two Dimensions



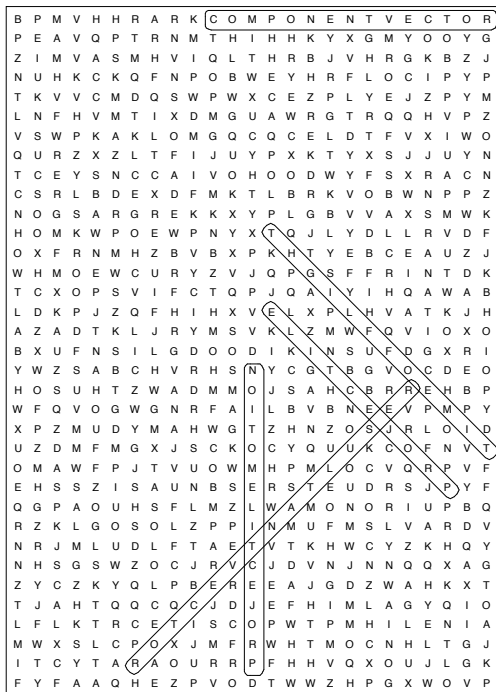
Vibrations and Waves



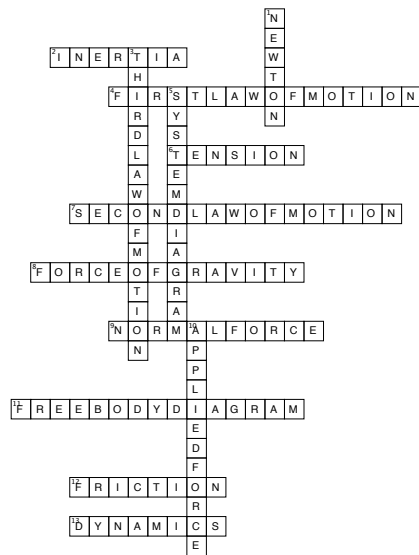
Kinematics



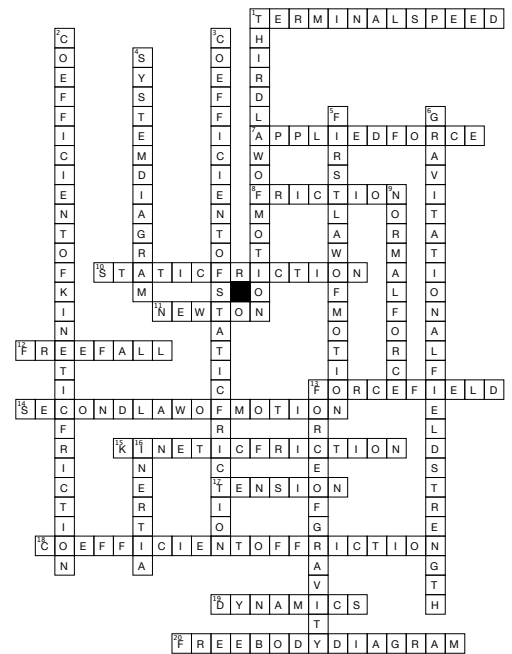
Motion in Two Dimensions



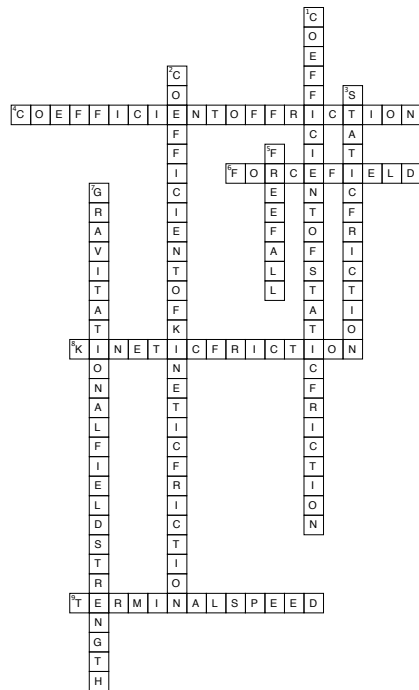
Newton's Laws of Motion



Forces

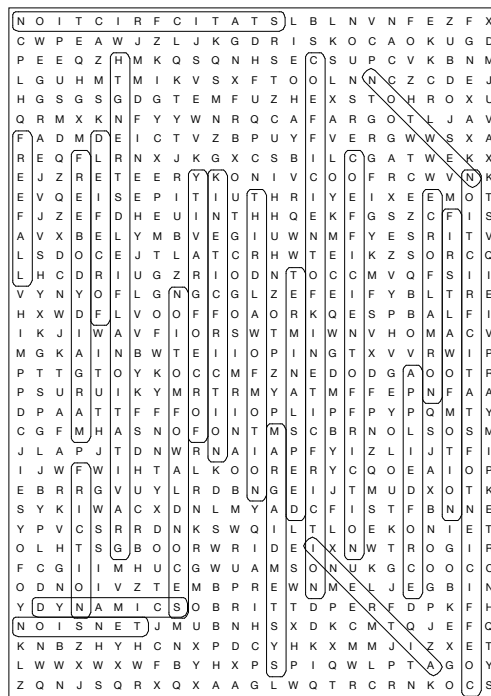
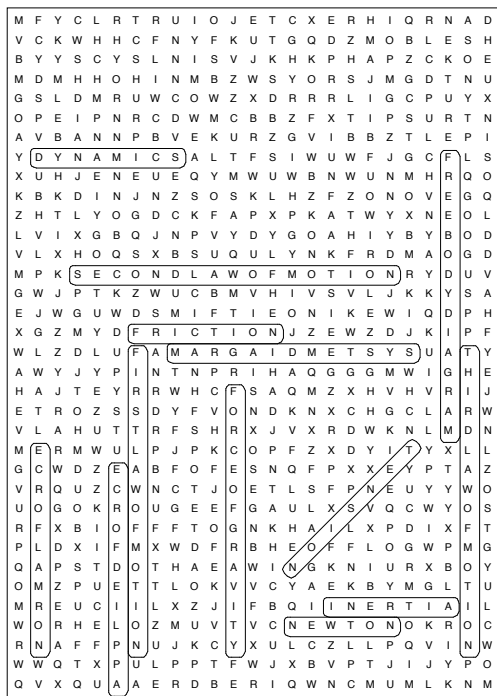


Applications of Forces

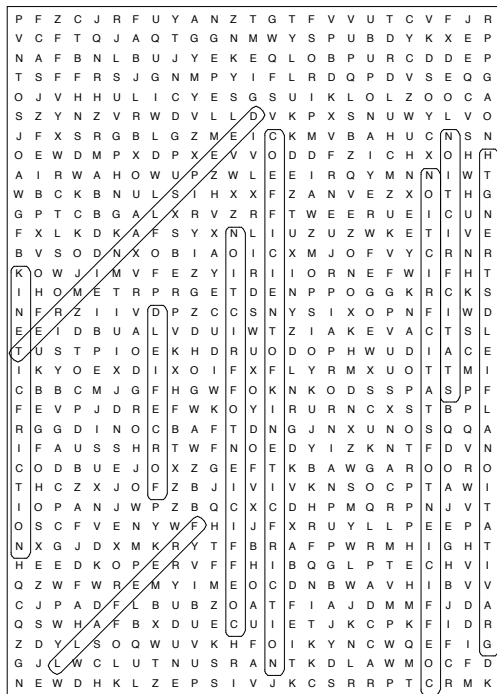


Newton's Laws of Motion

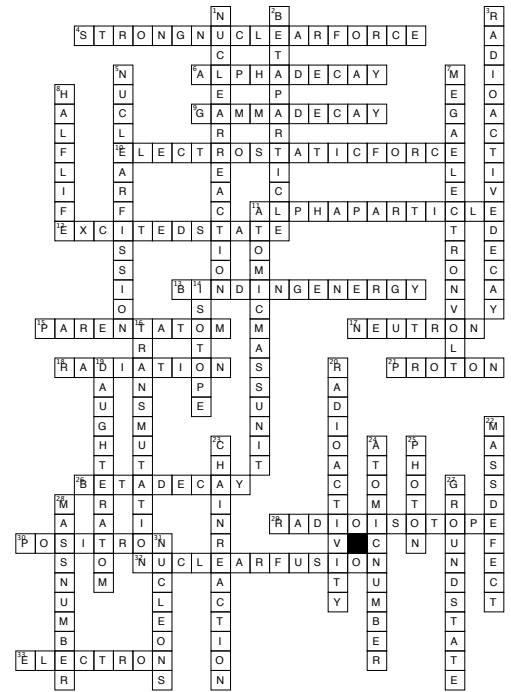
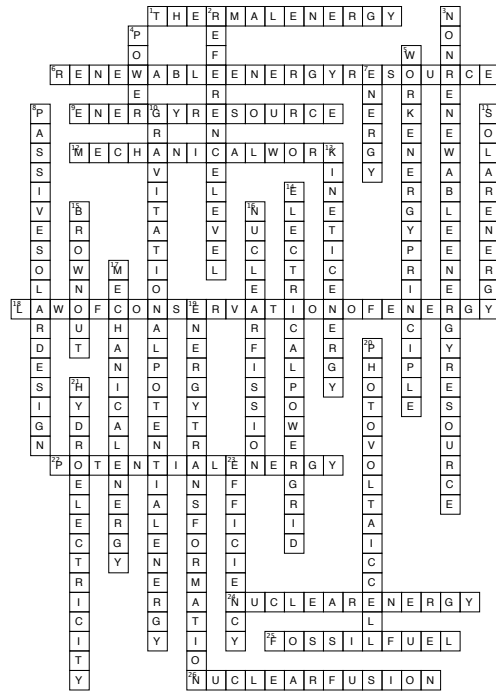
Forces



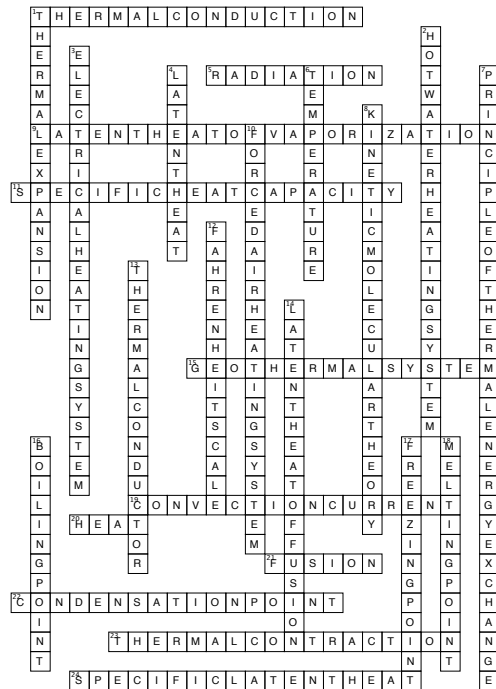
Applications of Forces



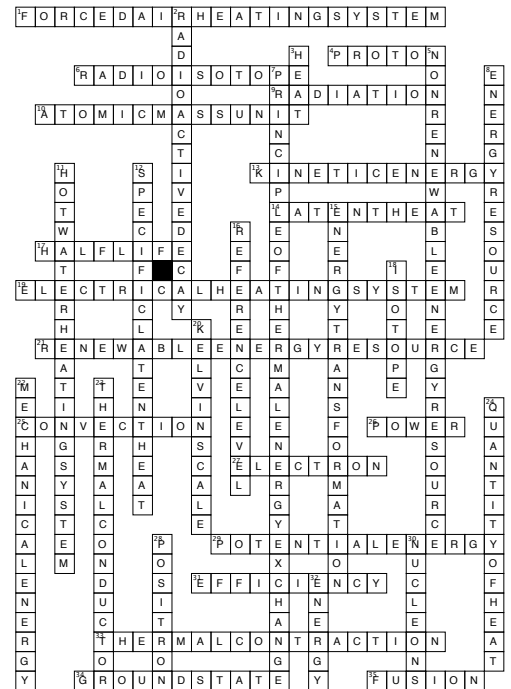
Nuclear Energy and Society



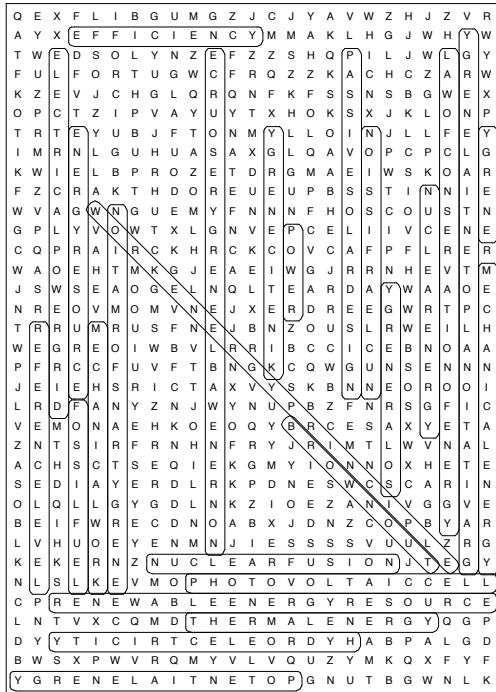
Thermal Energy and Society



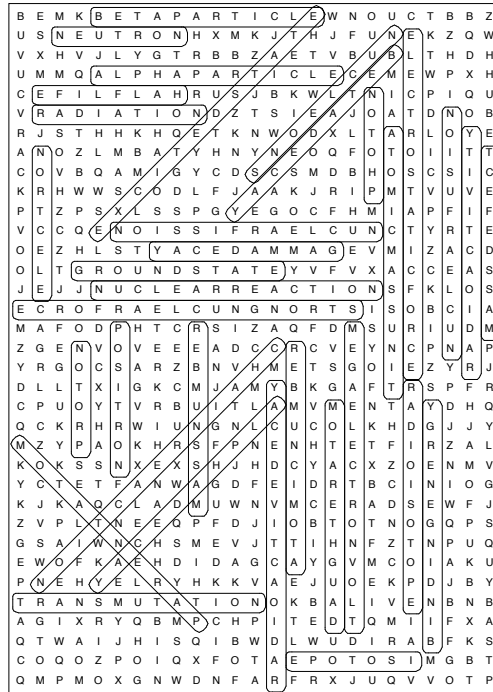
Energy and Society



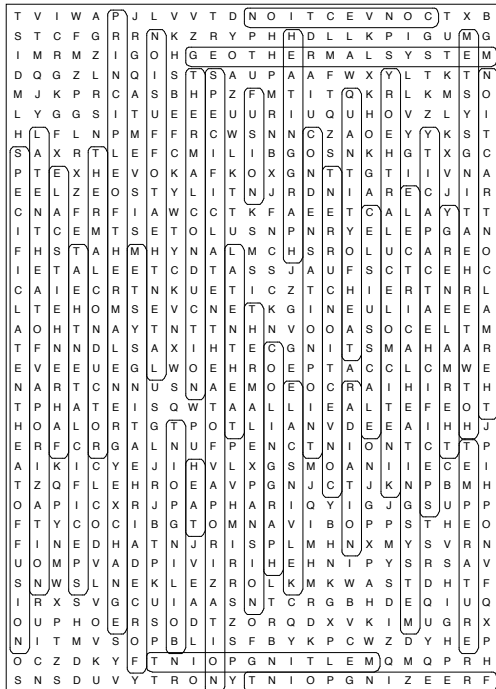
Work, Energy, Power, and Society



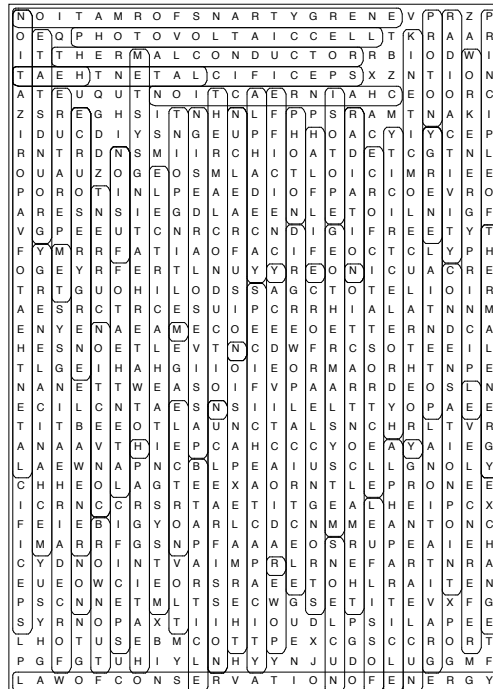
Nuclear Energy and Society



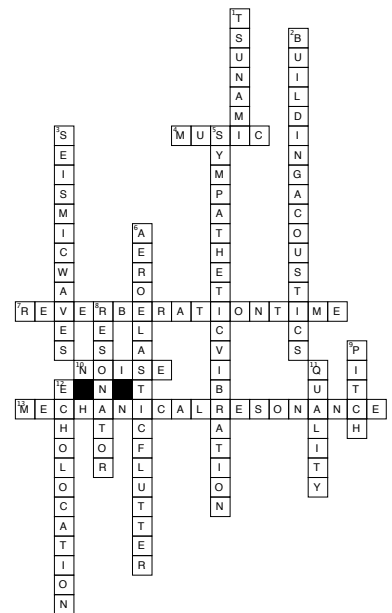
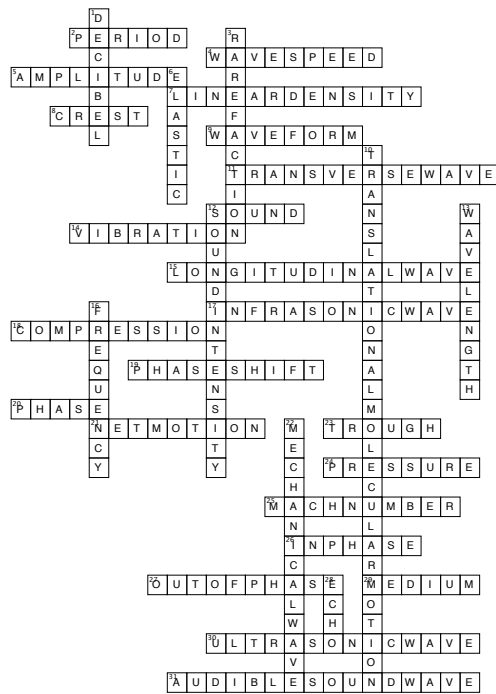
Thermal Energy and Society



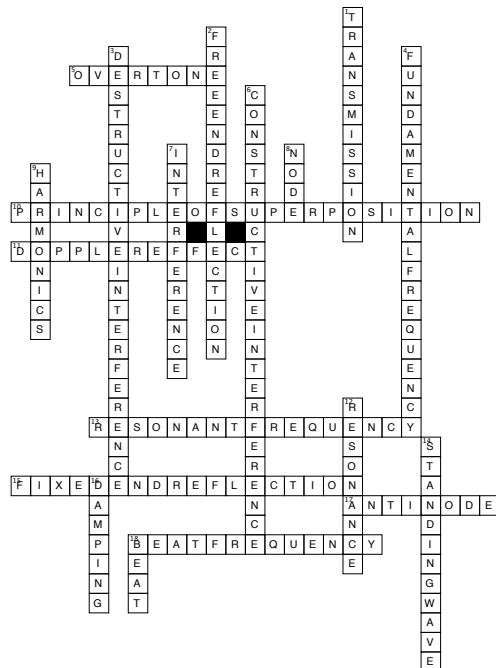
Energy and Society



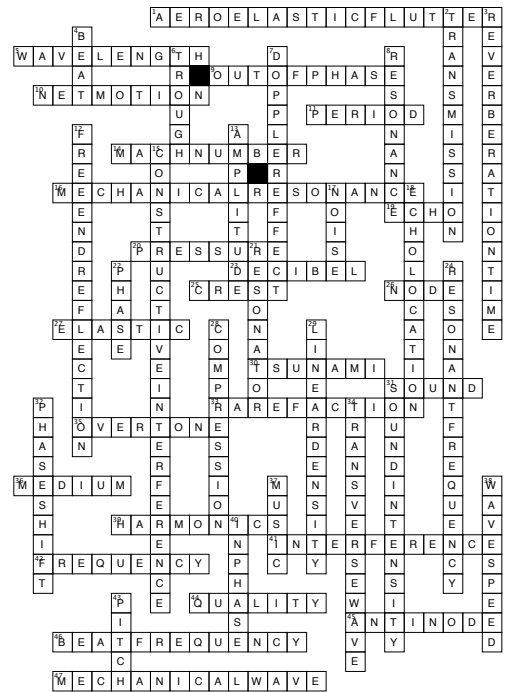
Applications of Waves



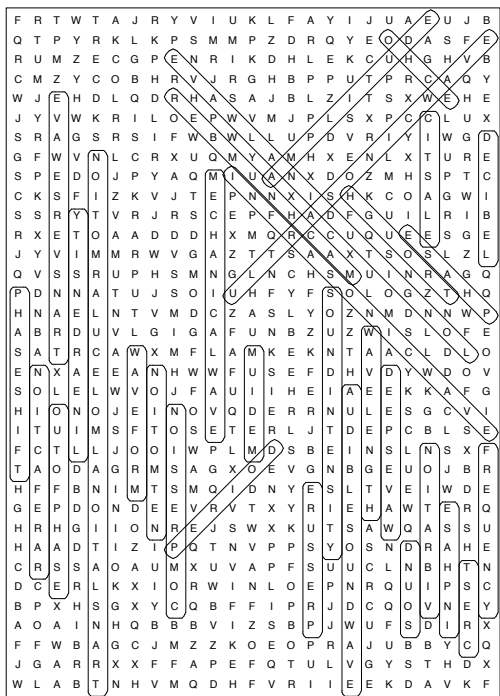
Wave Interactions



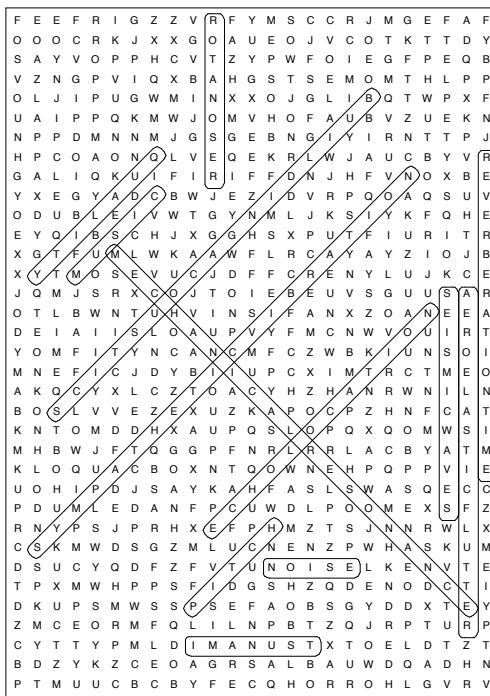
Waves and Sound



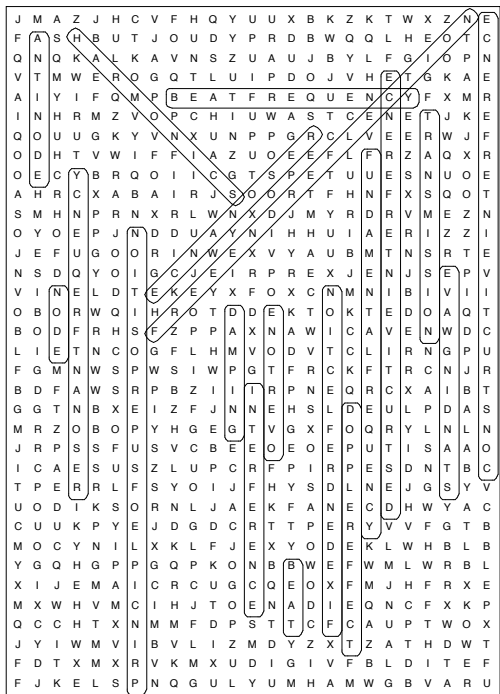
Vibrations and Waves



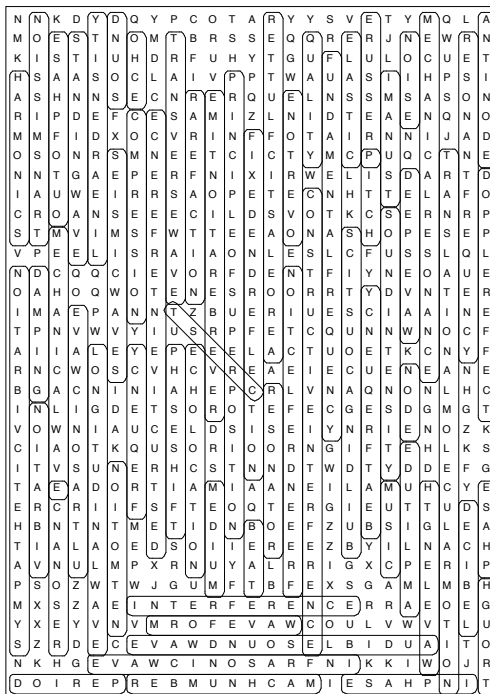
Applications of Waves



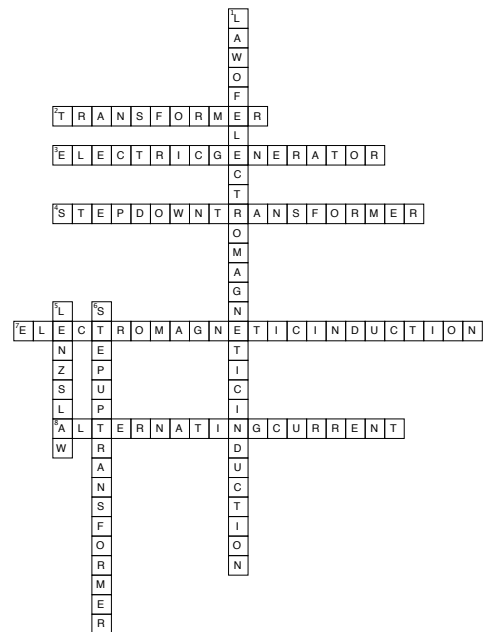
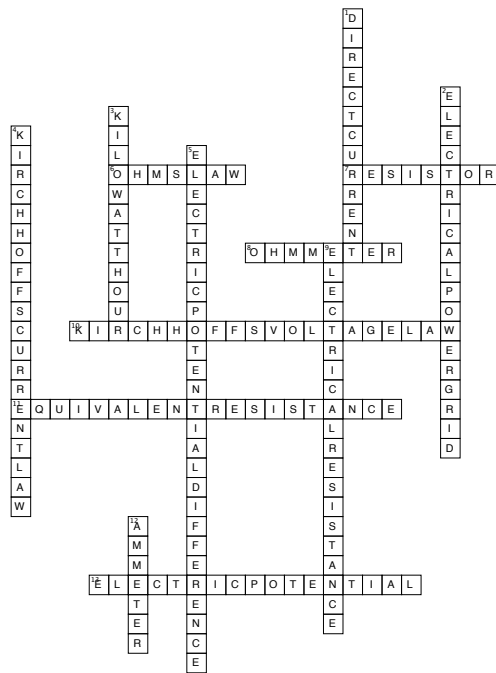
Wave Interactions



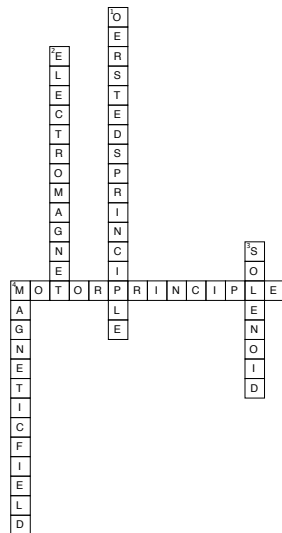
Waves and Sound



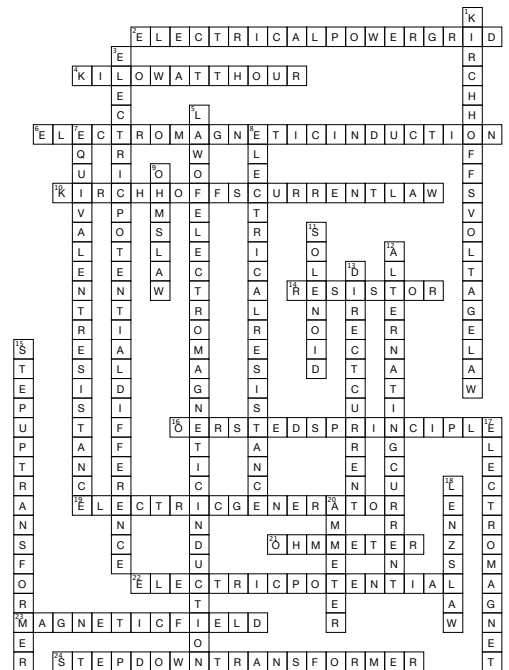
Electromagnetic Induction



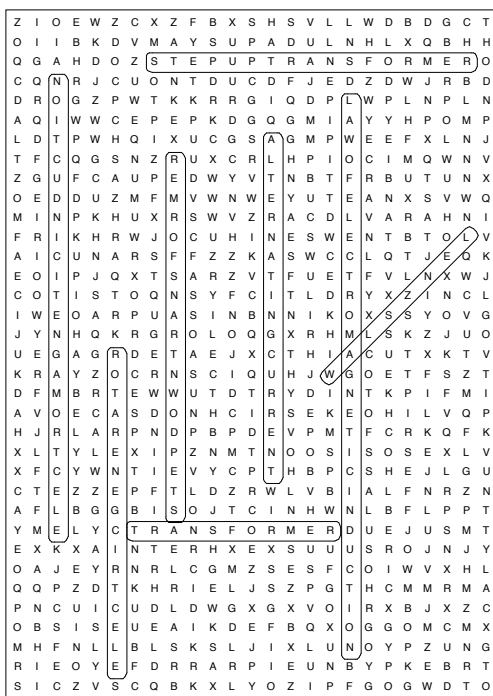
Electromagnetism



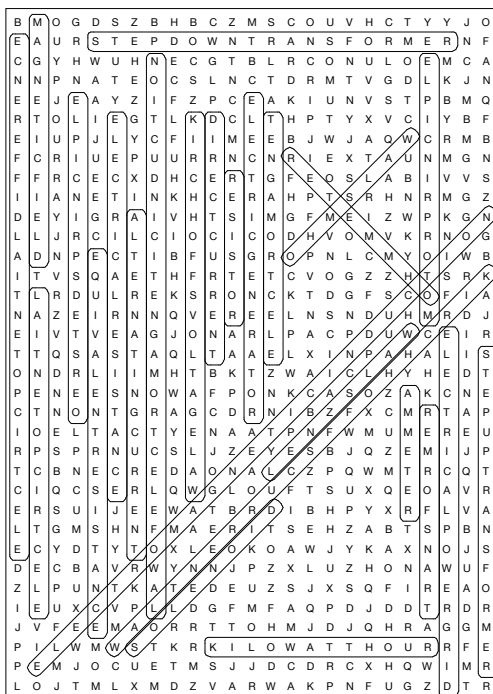
Electricity and Magnetism



Electromagnetic Induction



Electricity and Magnetism



Word Puzzles

from *Nelson Physics 11*



Kinematics

Contains puzzles for *Motion in a Straight Line*, *Motion in Two Dimensions*, and the whole unit.



Forces

Contains puzzles for *Newton's Laws of Motion*, *Applications of Forces*, and the whole unit.



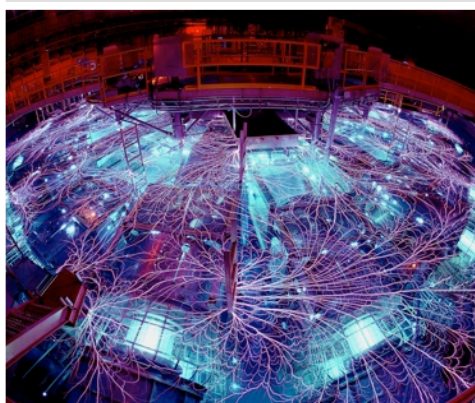
Energy and Society

Contains puzzles for *Work, Energy, Power, and Society*, *Thermal Energy and Society*, *Nuclear Energy and Society*, and the whole unit.



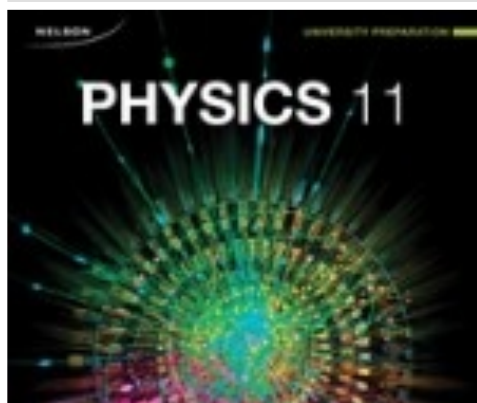
Waves and Sound

Contains puzzles for *Vibrations and Waves*, *Wave Interactions*, *Applications of Waves*, and the whole unit.



Electricity and Magnetism

Contains puzzles for *Electricity and Its Production*, *Electromagnetism*, *Electromagnetic Induction*, and the whole unit.



Nelson Education

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

Adam Smith