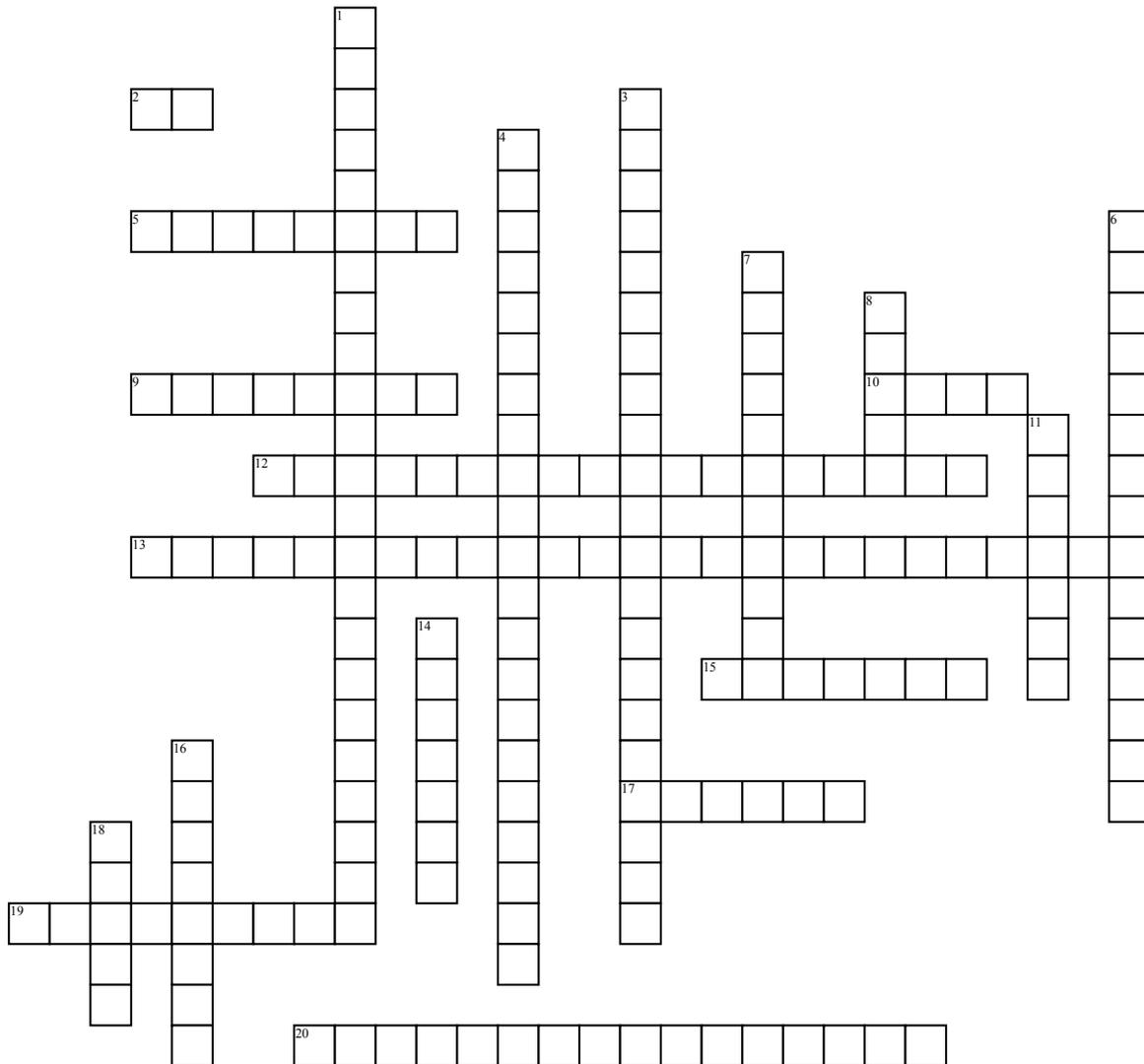


# Forces, Vectors, Circular Motion, and Energy



**Across**

- 2. What is the net force on a 27kg pendulum suspended by a string while at rest? (a. 0N; b. 264.6N; c. 42N)
- 5. Force that opposes the motion of an object.
- 9. Acceleration of an object due to nothing but Earth's gravity.
- 10. What is the formula for work?
- 12. When under the influence of this force, orbiting objects are in free fall.
- 13. Energy can never be created or destroyed, only converted from one form to another.
- 15. All forces are \_\_\_\_\_.
- 17.  $T = Fr$  (What is the force calculated by this formula?)

- 19. If two orbiting stellar bodies have masses of  $2.459 \times 10^{35} \text{kg}$  and  $3.110 \times 10^{21} \text{kg}$  and are  $2.500 \times 10^8 \text{km}$  apart, what is the gravitational force between them? Answer in scientific notation using correct sig-figs.
- 20. The force that allows an object to move in a circle.

**Down**

- 1. The acceleration of an object moving in a circular path which has a constant speed and a constantly changing direction.
- 3.  $G = 6.673 \times 10^{-11} \text{ N} \cdot \text{m}^2/\text{kg}^2$  (What figure does this equation represent?)
- 4. This occurs when the net torque acting on an object is zero.
- 6. This type of drawing is used to show the relative magnitude and direction of all forces acting upon an object.

- 7. What reactive force results from a man standing still under the force of gravity?
- 8. The rate at which work is done.
- 11. The property of an object that resists change of motion.
- 14. What is the mass of an object with a gravitational potential energy of 522kJ and is 135m off the ground? Remember sig-figs... (a. 400kg; b. 395kg; c. 394.6kg)
- 16. If a truck with a mass of 2110kg has a speed of 25.0m/s, what is its kinetic energy? Use sig-figs. (a. 26.375kJ; b. 26kJ; c. 659kJ)
- 18. A small homemade winch can lift a 50N weight vertically 2 meters in 10 seconds. How much power does the winch have? (a. 10J; b. 10.5J; c. 12J; d. 12.5J; e. 20J)