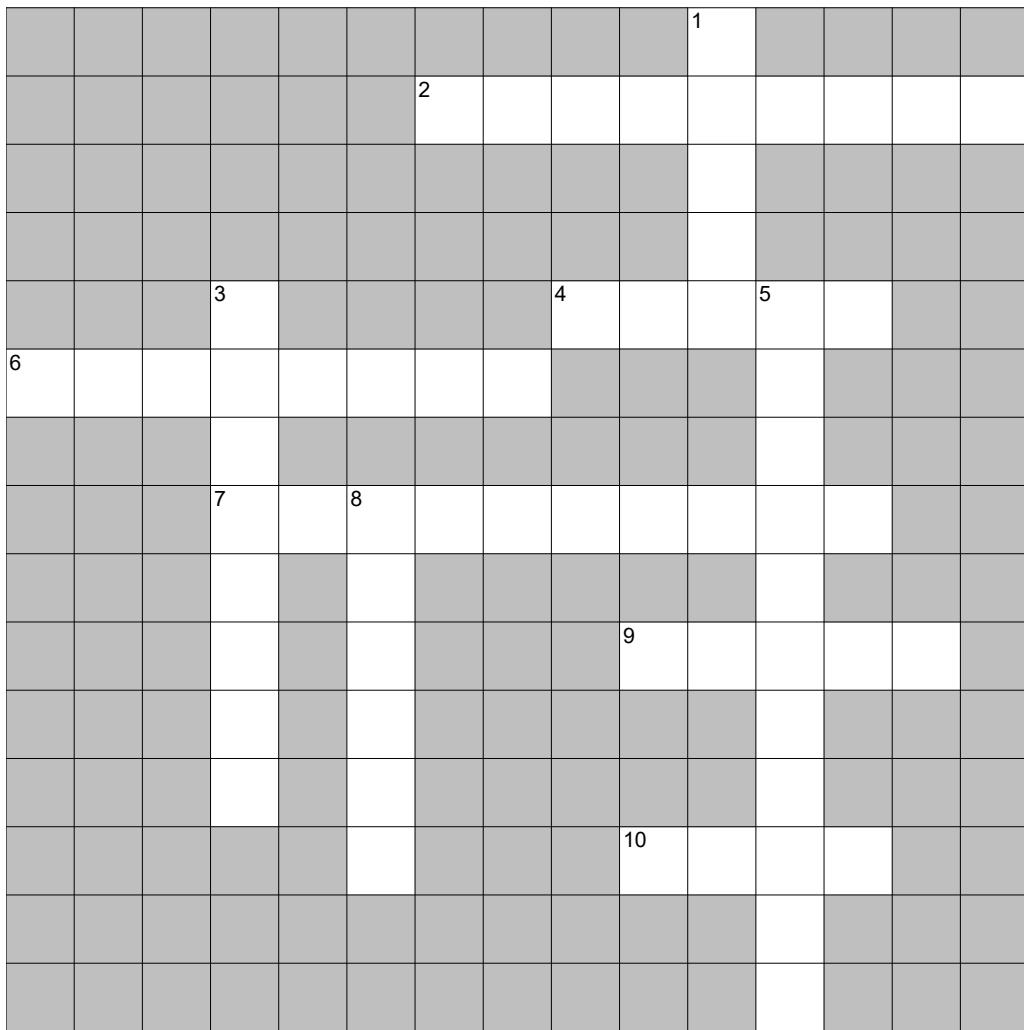


Archimedes



Across

2. The Roman leader who admired Archimedes
4. Archimedes' machine for pumping water out of the river
6. Where Archimedes was born
7. Where Archimedes went to school
9. The king of Syracuse
10. What the king challenged Archimedes to move by himself

Down

1. Machine Archimedes said he could move the earth with
3. Machine for throwing heavy stones
5. Another name for applied mathematics
8. The greatest teacher of geometry

Enrichment 2:



Mechanical Advantage

We use machines because they make work easier for us. The factor by which the applied force is increased is called mechanical advantage. Use the formulas listed below to solve the problems.

Lever

$$M. A. = (\text{Distance from fulcrum to effort}) \div (\text{Distance from fulcrum to load})$$

Wheel & Axle

$$M. A. = (\text{Diameter of wheel}) \div (\text{Diameter of axle})$$

Pulley

$$M. A. = \text{Number of pulleys}$$

Inclined Plane or Wedge

$$M. A. = (\text{Length of slope}) \div (\text{Height of ramp})$$

Screw

$$M. A. = 6.28 \times (\text{Width of the screwdriver}) \div (\text{Distance between the threads})$$

1. You are using a crowbar to pry apart two boards that are nailed together. It is 18 inches from the fulcrum to the effort and 2 inches from the fulcrum to the load. What is the mechanical advantage? If you can push with a force of 30 pounds, how much force will be applied to the boards?
2. You made a steering wheel for a go-cart. It has a diameter of 12 inches. Its axle has a diameter of 1 inch. What is the wheel's mechanical advantage? If it takes a force of 36 pounds to change the direction of the go-cart when it is rolling, how much force do you have to apply to the steering wheel?
3. You are putting furniture up in your tree house. Your mom is letting you have a comfy old chair from the living room. It weighs 75 pounds. If you can pull with a force of 15 pounds, how many pulleys do you need?
4. The ramp at the loading dock at HEB is 14.4 feet long and 3.2 feet high. What is the mechanical advantage of using the ramp?
5. You are building a shelf for your room. It is held together with screws. The distance between the threads is 0.1 inches. There are two screwdrivers in your garage. One is 0.25 inches wide and the other is 0.38 inches wide. Which screwdriver will make it easier to install the screws?