



## NAIL BALANCE

### SCIENCE SAFETY

PLEASE follow these safety precautions when doing any science experiment.

- **ALWAYS** have an adult present.
- **ALWAYS** wear the correct safety gear while doing any experiment.
- **NEVER** eat or drink anything while doing any experiment.
- **REMEMBER** experiments may require marbles, small balls, balloons, and other small parts. Those objects could become a CHOKING HAZARD. Adults are to perform those experiments using these objects. Any child can choke or suffocate on uninflated or broken balloons. Keep uninflated or broken balloons away from children.

### INGREDIENTS

- 21 7 Inch Gutter Nails
- Wooden Block
- Hammer

### INSTRUCTIONS

**STEP 1:** Using a hammer, have an adult hammer one of the nails into the center of the wooden block, so that the nail stands upright.

**STEP 2:** Place another nail on a flat surface and then place all except for one nail, alternating, head to head, across the nail. Place the last nail on top of these nails.

**STEP 3:** Carefully and patiently, pick up the nails and balance them on the nail, sticking out of the wooden block.

**STEP 4:** Slowly remove each nail. What happens to the remaining nails? Provide evidence of the effects of balanced and unbalanced forces on the nails.

### EXPLANATION

You were able to balance 20 nails on one nail due to center of gravity or center of mass. The center of gravity or center of mass is the place where you were able to balance the 20 nails on the one nail. The mass of the nails are evenly dispersed and all sides are in balance, until you start slowly removing each nail.



### SCIENCE BACKGROUND

A force is a push or pull, which can cause an object to be in motion. Pushes and pulls can have different strengths and directions. Motion is a change in position. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. Speed is how far an object moves over a specific period of time. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. Friction is the resistance between two objects. The force of friction opposes the motion of an object, causing moving objects to lose energy and slow down.

### I CAN STATEMENT

- ✓ I can plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on an object.

### NEXT GENERATION SCIENCE STANDARDS CONNECTION

3 – Forces and Interactions

