PHONE BOOK FRICTION

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

- Two Phone Books

INSTRUCTIONS

STEP 1: Overlap the pages of each phone book. For example, page one of the first phone book should overlap page one of the second phone book.
STEP 2: Have one person grasp the spine of one phone book, while the other person grasp the spine of the other phone book.
STEP 3: Attempt to separate the phone books by pulling.
STEP 4: Have one person apply more force, in a different direction, while attempting to separate the phone books. What are the effects of balanced and unbalanced forces on the phone books?

EXPLANATION

Because of friction, it is difficult to separate the phone books. Friction is the resistance between two objects. By overlapping all the pages in each phone book, you created a lot of friction.

Hooked on SCIENCE

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 compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
- ✓ 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

K – Forces and Interactions: Pushes and Pulls
3 – Forces and Interactions