



FIGURE SKATER SPIN

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

- Rotating Chair or Stool

INSTRUCTIONS

STEP 1: Sit in the rotating chair or on the rotating stool.

STEP 2: Make sure your feet are tucked in and not touching the ground. Pull your arms close to your chest. Have a friend spin you in the rotating chair or rotating stool.

STEP 3: As you are spinning, stretch your arms out wide from your chest and observe. Compare the effects of different strengths and different directions of pushes and pulls on the motion of you, when spinning in the rotating chair or on the rotating stool.

EXPLANATION

You'll noticed a big difference in speed when your arms are close to your chest versus when they are stretched out wide. The reason, when you stretch your arms out wide, your mass is distributed over a greater area, slowing you down.

OLYMPICS CONNECTION

Have you ever noticed how figure skaters spin super-fast when they pull their arms closer to their bodies? This speeded-up rotation results from a sudden redistribution of mass.



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. Each force acts on one particular object and has both strength and a direction.

An object at rest typically has multiple forces acting on it, but they add to give zero net forces on the object. Forces that do not sum to zero can cause changes in the objects speed or direction of motion. Motion is a change in position. The mass of an object affects the objects motion. An object with more mass requires a greater force to put the object in motion. Speed is how far an object moves over a specific period of time. An object moving at a greater speed changes position faster than an object moving at a slower speed. Inertia is the tendency of an object to resist change.

I CAN STATEMENTS

- ✓ 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.

NEXT GENERATION SCIENCE STANDARDS CONNECTION

K – Forces and Interactions: Pushes and Pulls





FLOATING PING PONG BALLS

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INGREDIENTS

- Hair Dryer
- Ping Pong Balls

INSTRUCTIONS

STEP 1: Turn on the hair dryer to the lowest setting and point the stream of air upward.

STEP 2: Place a ping pong ball into the stream of air and observe. Provide evidence of the effects of balance and unbalanced forces on the motion of the ping pong ball.

STEP 3: Turn on the hair dryer to the highest setting and point the stream of air upward.

STEP 4: Place a ping pong ball into the stream of air and observe. Compare the effects of the different strengths of air flowing from the hair dryer, on the motion of the ping pong ball.

EXPLANATION

The stream of air, flowing from the hair dryer, forces the ping pong ball upward. Gravity pulls the ping pong ball downward. Where the forces balance, the ping pong ball floats. The fast stream of air, flowing around the aerodynamic ping pong ball, creates a lower pressure, directly around the ball. The higher pressure, surrounding the ball, forces the ball into the stream of air.

OLYMPICS CONNECTION

Olympic athletes want to go faster and faster and to do so they must avoid drag, which is a force that slows down objects. To avoid drag, athletes wear special clothing engineered of materials, which are aerodynamic. Aerodynamics is the way air moves around objects



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I CAN STATEMENTS

- ✓ 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 the motion of an object.

NEXT GENERATION SCIENCE STANDARDS CONNECTION

K – Forces and Interactions: Pushes and Pulls

3 – Forces and Interactions





HYDROPHOBIC SAND

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INGREDIENTS

- Colored Sand
- Water
- Waterproof Spray
- Transparent Cup

INSTRUCTIONS

STEP 1: Spread the colored sand onto the cookie sheet.

STEP 2: Have an adult spray the sand evenly with the waterproof spray. Mix and spray the sand, several times. Allow the sand to completely dry.

STEP 3: Fill the transparent cup more than half the way with water. Pour the sand into the water, remove the sand from the water, and observe. Describe and classify the sand by its observable properties.

EXPLANATION

The sand remains dry, even when submerged into the water. The reason, the waterproof spray makes the sand hydrophobic, meaning it's scared of water.

OLYMPICS CONNECTION

Curling is a sport in which players slide stones on a sheet of ice. The granite used to create a curling stone is hydrophobic, meaning the stone resist water.



SCIENCE BACKGROUND

Matter is anything that has mass and takes up space. Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. Different properties are suited to different purposes.

I CAN STATEMENTS

- ✓ I can plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

NEXT GENERATION SCIENCE STANDARDS CONNECTION

2 – Structure and Properties of Matter





CD HOVERCRAFT

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INGREDIENTS

- Push/Pull Cap
- Superglue
- Balloon
- CD

INSTRUCTIONS

STEP 1: Superglue the push/pull cap over the hole in the CD.

STEP 2: Inflate the balloon. Close the push/pull cap. Pull the open end of the balloon over the push/pull cap. Gently push the CD hovercraft, on a flat surface, in different directions and observe.

STEP 3: Inflate the balloon, bigger. Close the push/pull cap. Pull the open end of the balloon over the push/pull cap. Push the CD hovercraft with a greater force, on a flat surface, in different directions and observe. Compare the strengths and different directions of pushes and pulls on the motion of the CD hovercraft.

STEP 4: Provide evidence of the effects of balanced and unbalanced forces on the CD hovercraft.

EXPLANATION

The air rushing out of the balloon and through the push/pull cap creates a cushion of air under the hovercraft. This cushion of air reduces the friction between the CD and the flat surface allowing the hovercraft to quickly move across the flat surface.

OLYMPICS CONNECTION

From curling to ice hockey, knowing the science of friction is key to bringing home the gold.



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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

