

Name: \_\_\_\_\_

# Get a Grip! (Teacher Version)

## Mighty Movement:

How do things get moving? A force is given to an object; either a push or a pull.

Can you describe the movement shown in the following images?



- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_

## Jitter Critter!

### Materials:

- Pushpin
- Cork
- Thumbtacks
- Pipe cleaner
- Large paper clip
- Broom/mop handle



### Instructions:

1. Use a pushpin to make 4 holes on each side of the cork. Insert half-lengths of pipe cleaner into each hole and bend them to make critter legs. Add thumbtacks for eyes.
2. Straighten a large paper clip. Wind it around the end of a broom handle about 1 ½ times, leaving about 1 inch extending out. Poke this “arm” into the end of the spider’s body (above the eyes).
3. Carefully slip the spider widget onto the broom handle. Hold the handle upright and gently press **down** on the spider.
4. Watch your jitter-critter jiggle down the pole! You may need to loosen/tighten to coil to get the right action.

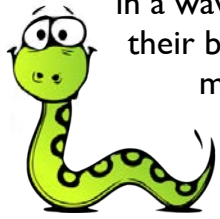
Name: \_\_\_\_\_

## Talk About It!

1. How does this toy work?  
*The forces of friction and gravity cause the stop-and-drop motion of the toy.*
2. Why doesn't the jitter-critter just fall?  
*The weight of the cork tilts the coil, causing the edge to rub against the broom handle. There's enough friction from this to temporarily stop the jitter-critter's fall.*

## Did You Know?

Just like the jitter-critter relied on **friction** to slow its fall, snakes rely on "muscle friction" to get around. When snakes move in a wavy-pattern, they are pushing their bodies against the ground to move forward. The bumpier the ground, the higher the friction, the easier it is for a snake to get around.



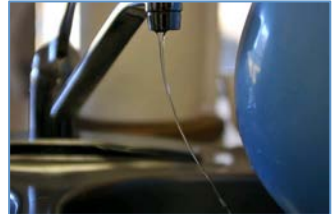
## Pushing & Pulling

Can you identify the following forces that cause movement? Are they push or a pull?

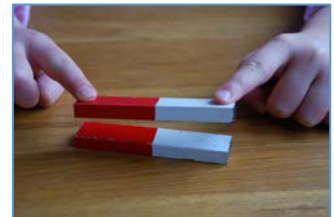
- 1) Snowball Roller: *Applied force; push*



- 2) Balloon and Water: *Electric force; pull*



- 3) Magnets: *Magnetic force; push*



- 4) Tug-of-War: *Applied Force/Tension; pull*



- 5) Parachutist: *Friction/Air Resistance & Gravity; push & pull*



Name:

## Image Sources:

### Mighty Movement:

1. Edward M Baldwin: <http://www.edwardmbaldwin.com>
2. Hunterdon Happening: <http://hunterdon.happeningmag.com/sledding-hunterdon-county/>
3. OFM: <http://www.ofm.co.za/article/70697/What-happened-to-Slinky>
4. Reischl Physical Therapy: <http://www.reischlpt.com/About-Us/About-Us/a~4521--c~346501/article.html>

### Jitter Critter!

1. Polyvore: [http://www.polyvore.com/thumbtack\\_pushpin\\_drawing-pin\\_clipart\\_free/thing?id=38321144](http://www.polyvore.com/thumbtack_pushpin_drawing-pin_clipart_free/thing?id=38321144)
2. Widget Co: <http://www.widgetco.com/wine-corks>
3. Scott's Thoughts: <http://scottsliver.blogspot.ca/2011/09/why-thumbtacks.html>
4. Photos Public Domain: <http://www.photos-public-domain.com/2011/02/05/colorful-pipe-cleaners/>
5. PSD Graphics: <http://www.psdgraphics.com/3d/paper-clip/>
6. Who Guides: <http://www.whoguides.com/who-invented-the-broom>
7. The Kraft Farm: <http://www.thekraftfarm.com/2012/10/spooky-cork-spiders.html>

### Did You Know?

1. Clipart Best: <http://www.clipartbest.com/clip-art-snake>

### Pushing & Pulling:

1. Shutterstock: <http://www.shutterstock.com/pic-92808634/stock-photo-young-college-age-woman-rolling-giant-snowball-to-make-snowman.html>
2. Meteo-Info: <http://blog.meteo-info.hr/djecji-kutak/savijanje-mlaza-vode/>
3. Science Kids: <http://www.sciencekids.co.nz/sciencefacts/magnets.html>
4. Hope For Your Family: <http://hopeforyourfamily.com/2010/01/26/tug-of-war/>
5. Public Domain Pictures: <http://www.publicdomainpictures.net/view-image.php?image=77961&picture=parachutist-with-yellow-parachute>