

Marble Mazes

Supplies:

Toilet paper tubes
Paper plates
Cardstock
Pool noodles (halved pieces)
Tape (scotch, masking, duct)
Scissors
Markers
Marbles

Have families create marble mazes using the supplies provided. Test with marbles and redesign maze as necessary. Encourage families to decorate their mazes with the markers.

Website link: <http://www.powerfulmothering.com/diy-marble-run-from-toilet-rolls/>



Catapults

Supplies:

Craft sticks
Rubber bands
Plastic spoons
Pom poms (and other soft projectiles)
Measuring tape

Have families create catapults (attach plastic spoon to catapult with rubber band instead of hot-gluing halved plastic egg). Can make different catapults at different heights and measure how far their catapult can toss the pom poms.

Website link: <http://www.instructables.com/id/Craft-Stick-Catapult/>



Egg Drop Challenge

Supplies:

Hard-boiled eggs
Ladder
Tarp
Various supplies: bubble wrap, tissue paper, egg carton pieces, rubber bands, etc.

Beforehand: put out tarp and ladder at egg drop site.

Talk with families about activity—what will they want to use in order to prevent their egg from cracking or breaking? Put out supplies and have students build a contraption for their egg to fit in. When they need an egg to fit in their contraption, write their name on the egg. When ready, start dropping protected eggs from the top of the ladder and open contraption to see what happened. Encourage families to tweak design or make a new one!

Website link: <https://stem.neu.edu/programs/ayp/fieldtrips/activities/eggdrop/>

Balloon Towers

Supplies:

Balloons (various sizes/shapes)
Balloon pumps (plural!)
Tape (scotch, masking, duct)
Measuring tape

In advance: blow up a lot of balloons.

Day of: before putting out balloons, talk to the kids about the activity. They can work individually or in groups to try to create the tallest free-standing balloon tower with just balloons and tape. Do they think it will work if they just tape one balloon on top of another? (Answer: probably not.) Remind them not to run when start to put out balloons. Bring out balloons and tape and let them build their towers/sculptures. Measure towers as necessary.

*Tip: Have multiple balloon pumps, along with 1+ volunteer to help blow up balloons during the program. Even if you think you have enough blown up before the program, you'll probably need more!

Website link: <http://stemactivitiesforkids.com/2016/01/31/two-easy-stem-tower-challenges/>

Earthquake Challenge

Supplies:

- LEGO pieces
- 2 large LEGO baseplates (same size/shape)
- 4 rubber bands
- 4 ping pong balls

Attach 2 large LEGO baseplates so that the 4 ping pong balls are sandwiched between (1 at each corner) and keep it all together with the 4 rubber bands. This will be your shake table!

Have families use LEGOs to create a building that can be moved to the baseplate for the earthquake test. When they're ready, start testing each building by placing it on the shake table and start with a gentle shake, getting less and less gentle with the shaking. Families might want to help with the shaking! Will the buildings withstand the earthquake?

Website link: <https://www.scientificamerican.com/article/bring-science-home-earthquake-proof-engineering/>

Cardboard City

Coming: August 2018!

Supplies:

- Cardboard boxes
- Toilet paper tubes
- Markers
- Crayons
- Masking tape
- Toy cars
- Scissors?

Website link: <https://innerchildfun.com/2012/01/cardboard-city.html>



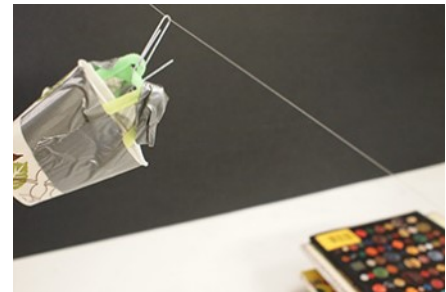
Zip Lines

Coming: June 2018!

Supplies:

- Cardboard
- Paper clips
- Ping pong ball
- 4 plastic straws or skewers
- Scissors
- Single-hole punch
- 2-4 small paper cups
- Smooth line (fishing wire or unwaxed dental floss)
- Tape (masking, duct)
- Weights (pennies or washers)

Website link: <http://pbskids.org/designsquad/build/zip-line/>



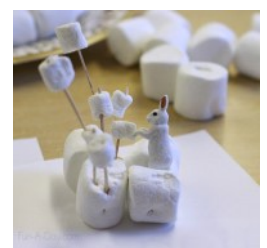
Forts and Winter Dens

Supplies:

- Toothpicks
- Marshmallows (various sizes)
- Gumdrops or jelly beans
- Small plastic animal toys

Talk about how some animals hibernate during the winter (brainstorm what animals do this) and how they need a winter den. Put out toothpicks, marshmallows, and gumdrops or jelly beans for families to build a winter den. Also put out the small plastic animal toys for the animals to "sleep" in their winter den.

Website link: <https://fun-a-day.com/engineering-project-kids-dens-winter-animals/>



Maps

Supplies:

Photocopied maps, markers, stickers, crayons
Ozobots, markers for Ozobots (red, green,
blue, black), colored pencils, large
butcher paper or huge post-its

Bee-bot, Mega Bloks, cardboard blocks

Table #1: Put out photocopied maps, markers, crayons, and stickers. Encourage families to use stickers to label landmarks and the markers and crayons to draw routes.

Table #2: Put out giant post-it or piece of butcher paper with directions: "Draw a city and "drive" (code) the Ozobots through the city." Encourage families to draw cities and towns with the colored pencils and code with the markers.

Floor: Put out Mega Bloks, cardboard blocks, Bee-Bot, and a sign with directions: "Build a city with the blocks and "drive" (code) the Bee-Bot through the city."

Paper Airplanes

Supplies:

Photocopied directions from books
Paper and cardstock in different colors and sizes
Paper clips
Rubber bands
Any additional supplies based on photocopied directions
Measuring tape

Put out photocopied directions and remaining supplies. Encourage families to create their own paper airplane design, tweak what they create, and measure how far their paper airplanes can fly.

Website link: <https://www.starnetlibraries.org/uncategorized/paper-airplane-challenge/>



Sail Cars

Supplies:

Cardboard box (I used shoeboxes)
3 wooden skewers (long enough to cross width of box and attach wheels)
Masking tape
Scissors
Markers
Measuring tape

Have families cut out bottom of box to use as body of the car. Use the remainder of the box to cut out a sail and 4 circular wheels. Use 2 skewers as axles—attach to car, then attach wheels. Use last skewer to attach sail and affix to car. Encourage families to decorate their car and have them measure how far they can "drive" (blow) the car.

*Tip: If you want to do this activity, I encourage you to find different instructions with different supplies—my families had a really hard time with this one!

Website link: <http://nerdybaby.blogspot.com/2011/10/sail-cars.html>