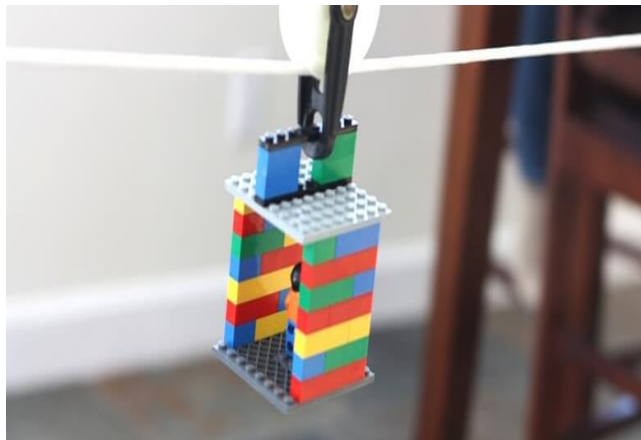




STEM LEGO Challenges



LEGO Challenge Calendars




- Print out 30/31 day LEGO Challenge Card Calendars. (Three printable calendars on the next pages, provided by <https://www.freehomeschooldeals.com/> and <https://littlebinsforlittlehands.com/>)

There are a multitude of ways to use this free printable LEGO challenge. Here are a few possibilities:


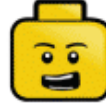
- Have a LEGO Challenge race: Who can complete their challenge the quickest? Using the most LEGO? Using the least? Using only one color? The possibilities are endless!
- Have your child take a picture of each day's creation. Then create a collage at the end of the challenge.
- After the challenge each day, encourage your child to write a few sentences (or paragraphs, depending on ability) about their creation. They can also draw and add a picture.

30 Day LEGO Challenge

Follow the instructions for each day. The only rule is to have fun and use your imagination!

			Day 1 You were hired by an amusement park to create a new roller coaster.	Day 2 NASA needs you to build a new rocket.	Day 3 Your parents want to build a new home and they want you to build it.	Day 4 Hollywood hires you to build a movie set for a new Star Wars movie.
Day 5 You enter a contest to build the world's tallest tower. Will you win?	Day 6 You are stuck on Mars and need to build a new ship to get home.	Day 7 Ford hires you to create the toughest pick up truck in the world.	Day 8 You and 4 friends are stranded on an island. Build a boat to find a way home.	Day 9 Captain Hook needs a new pirate ship and wants you to build it.	Day 10 You and your friends decide to build a tree house.	Day 11 Prince Charming hires you to build a castle for him & Cinderella.
Day 12 Dr. Who hires you to build a new TARDIS.	Day 13 You are asked by the President to build a new monument to George Washington.	Day 14 Mr. Hilton hires you to build a new hotel.	Day 15 There is a circus in town. Build a place for the performance.	Day 16 Help your fellow pioneers build a wagon to make it across the country.	Day 17 Build the fastest car around and join the big car race.	Day 18 Do you wanna build a snowman? Get in the winter mood and build a snow scene.
Day 19 The city wants you to build a bridge to connect one side of the town to the other.	Day 20 Pizza party! It is up to you to make a pizza for all the guests.	Day 21 You are hired to build a brand new hospital.	Day 22 The fence is broke and the dog keeps escaping. Build one he can't get out of.	Day 23 You are now in medieval times. You are commissioned to build a jousting arena.	Day 24 The local bank keeps getting robbed. Build a safe no one can crack.	Day 25 Design and build your dream bedroom.
Day 26 You are elected ruler. Build a flag for your land.	Day 27 Aliens are invading and you need to build a war robot to defeat them.	Day 28 The aliens have taken over. They are impressed by your robot. They want you build one for them.	Day 29 You are hired to build a house entirely out of yellow Legos.	Day 30 There is blizzard. You will need to build a snowmobile		
						What was your favorite day?

31 Day LEGO Challenge

			Day 1 You bought a private island. Build your dream beach house.	Day 2 Build a helicopter out of only red LEGOS.	Day 3 You were hired to build a new zoo!	Day 4 Build a new cinema with the largest screen in the city.
Day 5 Build an island to spend the summer on!	Day 6 Create a treasure map.	Day 7 Build the American flag.	Day 8 Build a playground.	Day 9 Create a new LEGO sculpture for your local art museum.	Day 10 Construct a time machine.	Day 12 You have been hired to build a new police station in your town.
Day 13 Build a cruise ship.	Day 14 Build your favorite landmark in your city.	Day 15 Create a LEGO pizza.	Day 16 Build a robot.	Day 17 Build an airplane out of blue and green LEGOS.	Day 18 Build two trees with a hammock hanging between them.	Day 19 Challenge another person to build the tallest tower.
Day 20 Build an elephant using your favorite color LEGO.	Day 21 Create a fruit salad.	Day 22 Build your favorite sea animal.	Day 23 A king hired you to build him a new castle.	Day 24 Your assignment is to build a waterpark.	Day 25 Build a sundae.	Day 26 Build your favorite musical instrument.
Day 27 Build your favorite cartoon character.	Day 28 Create a jungle.	Day 29 Build a beach ball.	Day 30 Build a mountain.	Day 31 Build a bicycle.		

LEGO CHALLENGE CALENDAR



31 Days of Fun Ideas for Any Month!



LITTLE BINS
BY LITTLE HANDS

DAY 1

Build Your
Name or Initials

DAY 2

Build a Person
With Moving
Legs and Arms

DAY 3

Build a
Catapult

DAY 4

Build a Robot

DAY 5

Build a House
That Opens

DAY 6

Build a Boat
That Floats

DAY 7

Build a 100
Brick Tower

DAY 8

Build a Box
With a Lid

DAY 9

Build a Small
World Scene

DAY 10

Write a
Comic Strip for
a Minifigure

DAY 11

Build a Model
of Your Room

DAY 12

Build a Simple
Machine

DAY 13

Build a Bridge
That Can Hold
Something Heavy

DAY 14

Build a
Favorite
Character

DAY 15

Make a Mosaic
Using Flat Pieces
On Baseplate

DAY 16

Draw a Design
Make it with
LEGO Bricks

DAY 17

Build Something
To Go With
A Favorite Book

DAY 18

Build a swimming
pool for
a minifigure

DAY 19

Build With
Eyes Closed
5 Minutes

DAY 20

Build a
Pyramid

DAY 21

Build a
Marble Run

DAY 22

Draw a Play Mat
and Add LEGO

DAY 23

Learn Paper
Football and
Build a Goal

DAY 24

Have a Minifigure
Building Race

DAY 25

Build a
Marble Maze

DAY 26

Try to Sink
a Minifigure

DAY 27

Build a
Zip Line

DAY 28

Make Your Own
LEGO Skittles
Game

DAY 29

Build a
Parachute
for a Minifigure

DAY 30

Build a Car
Attach a Marker
and Draw!

DAY 31

Ask For a Bin of
Soapy Water
Wash LEGO!

Wind Powered LEGO Challenge – Mission LEGO Rescue

Wind Powered Challenge – Mission LEGO Rescue from Steam Powered Family is another great activity for your studies of energy conservation and wind power. (<https://www.steampoweredfamily.com/>)



Challenge: The engineering design challenge is design and build an invention that can lift a Lego Mini Figure up to the top of a rocket using the power of the wind.

Supplies:

- Lots of random items to encourage creativity
- Milk Carton or Box (like a shoe box)
- Skewers
- Corks
- String
- Construction Paper
- Tape
- Scissors
- Ruler
- Legos
- Lego Mini Figure



Note: To test, you will need wind. To create wind, you can try the following: fan, outside (if windy day), or blowing using just your mouth or straw.

When doing this challenge, encourage the kids to try different builds and designs. This is a fantastic engineering activity.

Get inspired by the true story of William Kamkwamba, a boy who lived in a tiny village in Malawi, where his family lost all of the season's crops, leaving them with nothing to eat and nothing to sell. William began to explore science books in his village library, looking for a solution. There, he came up with the idea that would change his family's life forever: he could build a windmill. Made out of scrap metal and old bicycle parts, William's windmill brought electricity to his home and helped his family pump the water they needed to farm the land.

Can read his story: *The Boy Who Harnessed the Wind: Picture Book Edition* by William Kamkwamba or watch the movie on Netflix by the same title.

Fly Down the LEGO Zipline!

Simple LEGO Zipline from Little Bins Little Hands. A little physics and engineering challenge with a big WOW factor. Build this simple zip line for your minifigure, and later turn it into an experiment. How much can it hold? How does weight affect speed? And why? (<https://littlebinsforlittlehands.com/>)



Challenge: Build a zipline that can move a LEGO Figure from one side of the room to the next. Explore slopes, tension and gravity.

Supplies:

- Rope {clothesline}
 - Pulley Mechanism {also clothesline supply}
 - LEGO Bricks, Plates, Minifigures
- Or just rope and LEGOS for a simpler design.



Ask questions:

- What makes the man travel faster down the zip line?
- Is a steep slope better?
- What happens to the LEGO man when he

EXPERIMENT WITH LEGO

We attached the rope to 2 fixed points in the house. I suppose you could try it outside but keep track of the pieces if you have a crash landing! Test out different angles with the rope to explore force and motion.

Do different angles increase or decrease speed? Can you increase or decrease speed halfway through? Test out different designs to see which ones hold up better too!

Build a LEGO Water Wheel

Build a Lego Water Wheel from Frugal Fun for Boys and Girls. A fun STEM project for kids that is perfect for warm weather – build a LEGO® water wheel and experiment with fluid dynamics. (<https://frugalfun4boys.com/>)



Challenge: Design and build a water wheel out of LEGOS that turns with the flow of water. Add a dam to your challenge (a way to stop and store water, then open up to allow the water to flow).

Supplies:

- Something you can make a ramp out of and build on top of.
- Legos
- Duct Tape
- Water



Water Wheel

Water wheels are machines that use the energy of flowing or falling water (or both) to turn a wheel. The axle of the turning wheel can then power other machines to do work.

Water wheels were used throughout Europe during the Middle Ages (approximately 500 to 1500), as the main source of power for driving large machines.

Hydroelectric Dam

Hydroelectric dam systems generate power when the water that has been stored in the dam is released (by opening the dam) into a pipeline and flows over a turbine. The force of the water causes the turbine to spin, which operates a generator. The generator produces electricity which is transferred to a substation and then into a grid.



Rubber Band Powered LEGO Car

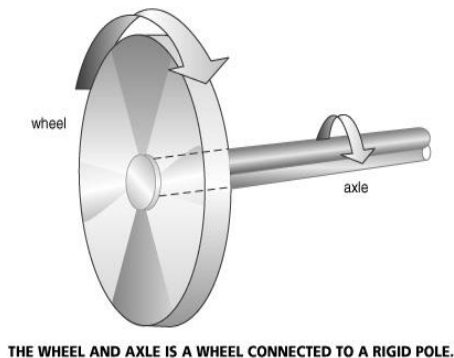
Build a Rubber Band Powered LEGO Car from Frugal Fun for Boys and Girls. A fun contraption to build out of LEGO bricks – make a fun little car that is powered by a rubber band! This rubber band powered LEGO car is a great engineering project that demonstrates the power of potential and kinetic energy. (<https://frugalfun4boys.com/>)



Challenge: Use LEGOs and a rubber band to design and build a working car. The rubber band must wind around an axle and power the car when it releases its potential (stored) energy, turning it into kinetic energy.

Supplies:

- LEGOS (like the ones pictured, but not limited to)
- Rubber Band



Tips:

- You can build your car many different ways, but several concepts you must think about when designing and building your car. The basic design involves a pin that sticks up at the front of the car (does not move). Then a second pin is attached to the back axle. To make the car work, you'll stretch a rubber band around both pins and then turn the back wheels to wind the rubber band around the back axle.
- Wheel and Axle is a simple machine, often a big wheel and a small axle, which is secured to one another. A wheel and axle always rotate at the same speed.
- When you turn the axle on the car, you are giving the rubber band potential energy—which is stored energy. When the rubber band unwinds and the axle spins, it transforms the potential (stored) energy into kinetic energy—or motion energy.

LEGO Marble Maze or Epic Marble Run

Build a LEGO Marble Maze or Epic Marble Run from Little Bins Little Hands and Frugal Fun for Boys and Girls. There's lots to learn when you are building a LEGO marble maze or Epic Marble Run! Planning, engineering, testing, problem solving, and designing are all a part of the process. A little trial and error is all a part of the process.

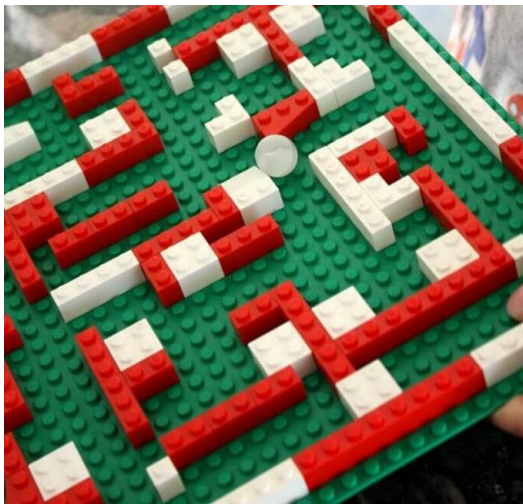
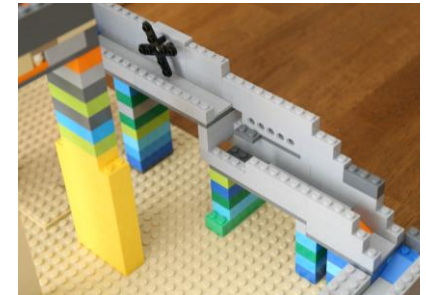
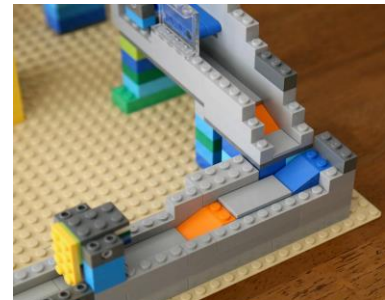
(<https://frugalfun4boys.com/>) (<https://littlebinsforlittlehands.com/>)



Challenge: Build a flat maze to run a marble through by tilting it back and forth. Or build a marble run, starting at a higher point, moving a marble from the top of the run to the bottom without moving the structure.

Supplies:

- Lots of LEGOS
- LEGO Base Plates
- Marble



Tips:

- Use your marble to measure how wide your maze or run needs to be to move freely through.
- Start at the bottom when building your marble run. It's SO much easier to build that way. Build a spot to catch marbles at the bottom, and then start building your ramps.
- Use tiles on your ramps to make the marbles roll more easily.
- You don't need a steep slope. Marbles on tiles roll very easily! Keep your slopes gentle to keep the marbles from rolling out of control.

LEGO Balloon Powered Car

Build a LEGO balloon Powered Car from Little Bins Little Hands. This challenge explores simple concepts like force and motion. The balloon forces out air which puts the car into motion. When the force slows down and eventually stops {empty balloon}, the car slows down and stops too. A heavier car will need a greater force but may not travel as far as a lighter car which will require less force to go farther. (<https://littlebinsforlittlehands.com/>)



Challenge: Design and build a LEGO car powered by a balloon. Build different size cars and test which one goes the furthest and why? Hold a contest or a car race.

Supplies:

- LEGOs, including wheels
- Balloon
- Balloon Pump (optional)
- Tape measure



Things to think about when creating your design...

- The car must be vertically and horizontally stable.
- The balloon needs to have enough space to inflate.
- The balloon must be attached to the car in some way.
- The wheels should be protected so the balloon doesn't hit them.
- If having trouble rolling, test on different types of surfaces.



LEGO Spinning Tops and Battle Arena

Build LEGO Spinning Tops and Battle Arena from Frugal Fun for Boys and Girls. This is a favorite challenge because there are so many ways to build a spinning top, and they spin REALLY WELL. You don't have to have a lot of special pieces – everyone will have the parts for this! (<https://frugalfun4boys.com/>)



SPINNING TOPS LEGO Building Challenge



Challenge: Builds spin tops out of LEGOS. See which designs spin the longest and the fastest. Build a battle arena out of LEGOs. Which design held up the best during a battle?

Supplies:

- LEGOs
- Tape and Poster Board or smooth cardboard



- Kids can spin the tops directly on the table or floor. Or they can build a “battle arena” for them, sort of like Beyblades. They spin longer on the table because they don't bump into anything, but the downside is that they often find their way to the edge of the table and fall off, which results in pieces coming off. It's really fun to do both! Spin them on the table, and then try battling more than one of them in your arena.
- You can build a frame to your area and directly place it on smooth surface (like a table). Or you can attach a floor to your arena, like a poster board, cardstock, or a smooth piece of cardboard.

Ask....

- Does the top spin better with a long axle or a short axle? In other words, where should the center of gravity be?
- What is the best method of releasing the top?
- Do the colors of the bricks on your top appear to change when it's spinning?

LEGO Candy Dispenser

Build a Candy Dispenser out of LEGO from Frugal Fun for Boys and Girls. Kids will love this build. If you have candies in the house like m&ms or skittles, this is the perfect build for your household. (<https://frugalfun4boys.com/>)



LEGO CANDY DISPENSER Building Instructions



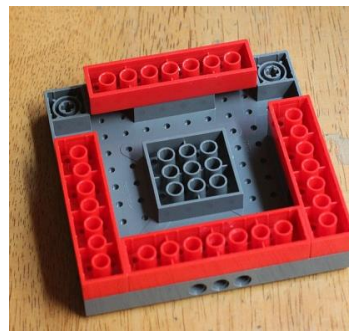
Challenge: Build a candy dispenser using LEGOs. You can follow build instructions or create your own design.

Supplies:

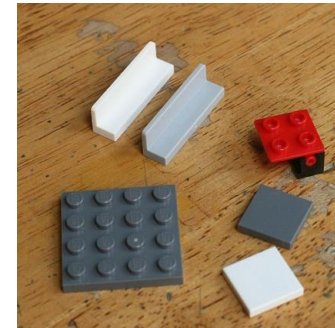
- LEGOs
- Candy



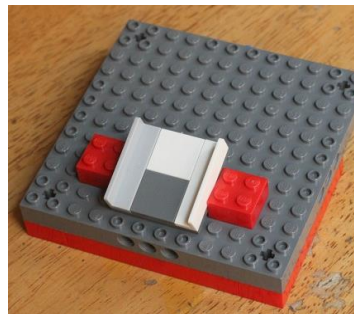
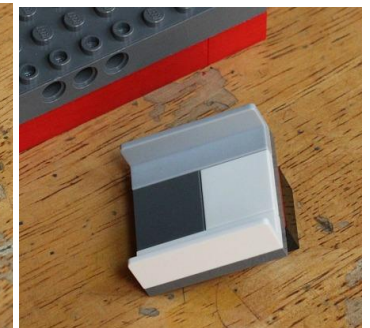
Step 1: Start with a 12 x 12 baseplate or something similar.



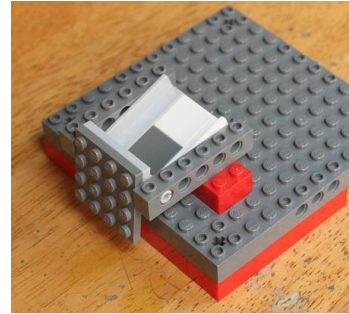
Step 2: Add bricks to the bottom of the base plate to boost it up a little.



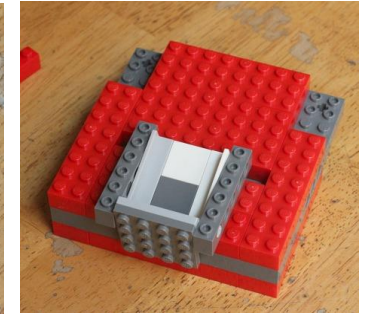
Step 3: Assemble the pieces like this. This will be a ramp for the candy to slide down.



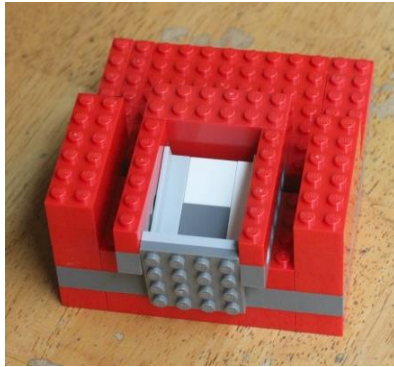
Step 4: Attach the ramp to the base plate as shown. Add two 2 x 2 bricks.



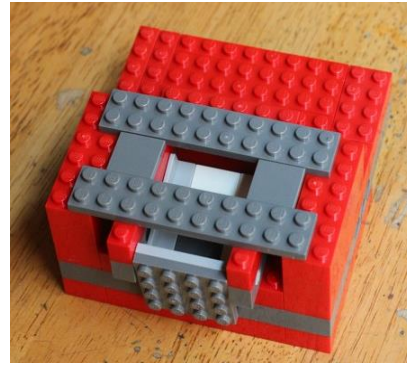
Step 5: Find pieces that look like this. This will be the door that lets the candy out



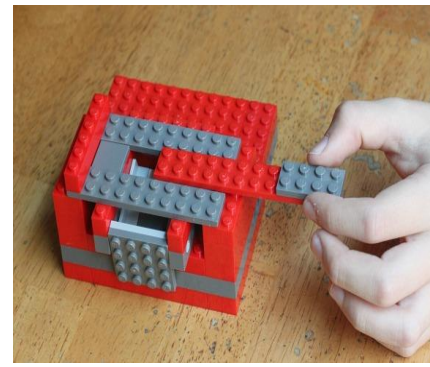
Step 6: Add bricks to the base plate as shown.



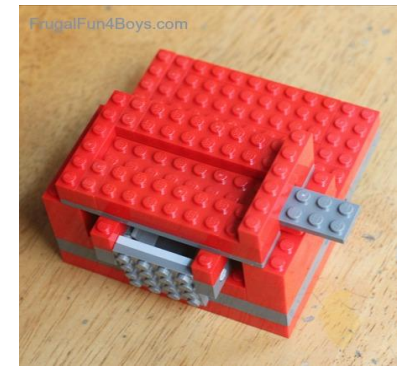
Step 7: Add two 2 x 6 bricks to each side. Add one 1 x 6 to each gray piece with holes. Add two 2 x 6 bricks behind the ramp.



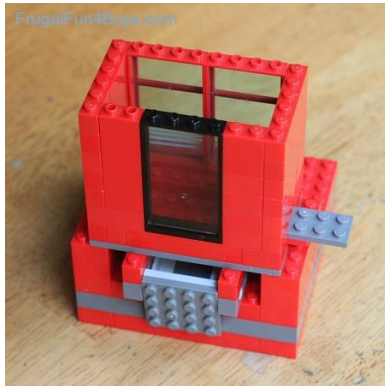
Step 8: Add two flat 2 x 10 pieces above the ramp as shown. Add two flat and smooth 2 x 2 bricks. These bricks will allow the arm that lets the candy out to slide back and forth.



Step 9: Add a 1 x 6 brick to the left side as shown. Build the sliding arm as shown – one 2 x 10 flat brick and one 2 x 4 flat brick.



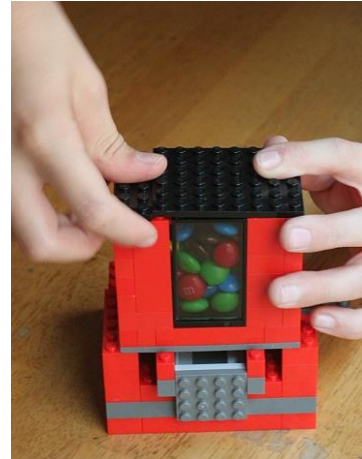
Step 10: Start building up the candy chamber as shown.



Step 11: Add height to the candy chamber. We used some window pieces so that you can see the candy level inside.



Step 12: Fill with candy!



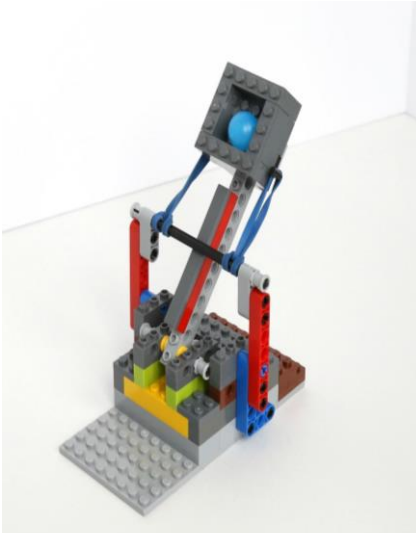
Step 13: Add some flat pieces for the top.

Check out the following video to see it in working action...

<https://youtu.be/cDmPBAH3x1I>

LEGO Catapult

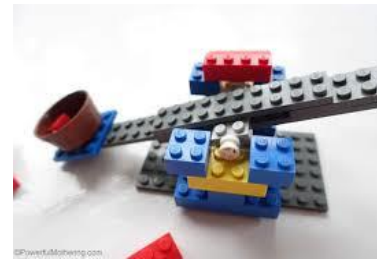
Build a Catapult out of LEGO from Frugal Fun for Boys and Girls and Little Bins Little Hands. Kids can create their own catapults and tinker with them until they find a design that launches their objects the farthest. (<https://frugalfun4boys.com/>) (<https://littlebinsforlittlehands.com/>)



Challenge: Design and build a catapult using LEGOs. Your catapult must launch an object to a designated target. Create a game out of it with a partner.

Supplies:

- LEGOs
- Rubber band (optional)
- Object to catapult



- LEGO catapults are great demonstration of potential and kinetic energy. When kids pull back on the arm, the rubber bands stretch and gain potential energy. Then when they let go, all that potential energy is converted to kinetic energy, or the energy of motion!
- Does the tension of your rubber band matter? If your object does not fly far, how might you change the tension on your rubber band?
- Build a base for your catapult for stabilization.
- How will the arm of your catapult hold the object to be launched?
- Incorporate math by measuring distance traveled
- Incorporate math by recording time in the air with stopwatches
- Incorporate the scientific method, make predictions, build models, test and record results, and draw conclusions!