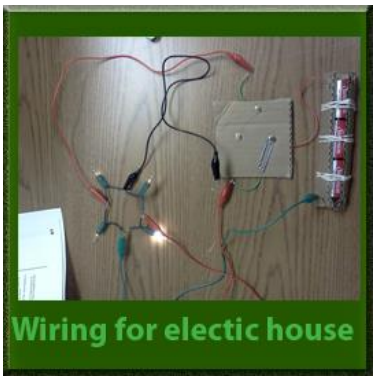
PARENT LETTER FOR ELECTROFIED AND ROBOFIED

We are excited about our week of camp with your child! Our students will come out of this camp with a great understanding of the relationship between electricity and magnetism. The students will create an electric house and a car that responds to its environment.

Watch a Video of this Camp

ELECTRIC HOUSE



We will start the camp with an introduction of what it means to be a robot. We will explore Ferrofluid and magnetic fields.

We will move next into our electric house. Here they will learn about circuits and make their own battery holders and switches.

When they have finished this, they will create a four room house where each room operates independently using the switches they created.

ELECTRIC CAR

The students will make their own car that responds to its environment through a bumper switch. They will create the circuit and test the car with three different modes of transportation.

They will test gears, pulleys and wind power to see which method optimizes the cars motion.

They will see the internal workings of a motor.

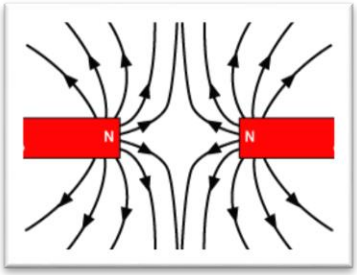
TECHNOLOGY

Electrified and Robofied camp will examine Circuits through fun science experiments. So, our technology part of the camp will continue to complete circuits, but will also examine another type of power that creates movement in machines! Our students will have the opportunity to build several different activities while learning how simple machines work. Most of these builds will be attempted during the camp or class time. How many depends on the abilities of the students. The average time it takes for each build is 1 hour, but can take up to 1 and ½ hours. We hope to complete all builds offered in each camp.

MAGNETIC BUILDS:

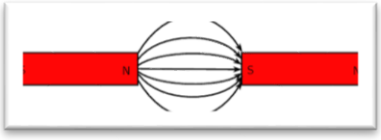
Circus Magna: We are going to experiment with magnetic forces that repel and attract; in effect create motion in this building activity. This is pretty cool! We can do two different experiments as the car rolls under the gate. In the picture above the magnets are in repulsion positions.

A magnet has a north and a south pole so, either both north poles are facing each other or both south poles are facing each other in the repulsion position. As the car rolls underneath the gate, the magnets will push away from each other.

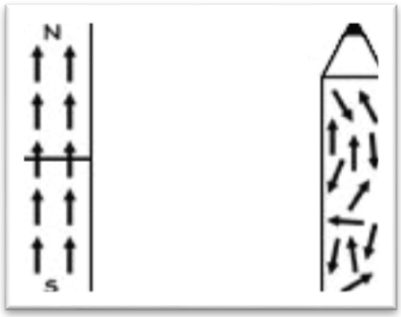


The repellant force of the 2 magnets will make the pole tip causing our Circus Magna performer to do a back flip off the jump pad.

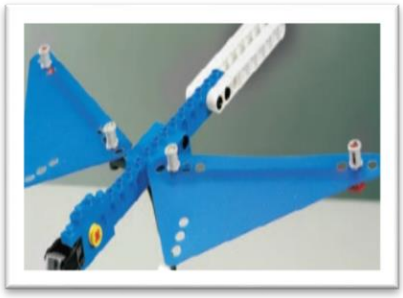
The second experiment will have the magnets in the attraction positions; North and South poles facing each other. The Circus Magna performers' jump seat will be pulled down to connect with the magnet located at the front of the car as it roles under the gate. The performer will ride away with the car. How fun!



Magno Bird: This building activity uses the magnet to collect items from around the room. What has a magnetic charge and what doesn't? We'll find out as we put items of differing substances on a table, the floor, chairs or where ever! Does the Magno Bird pick up plastic Lego bricks? Why not?



All substances are magnetic because they are made up of atoms. The difference between a weak magnetic force and a strong one is the atoms line up in a magnet. Some atoms line up more so than others. That's what makes a weak force and a stronger or strongest force.



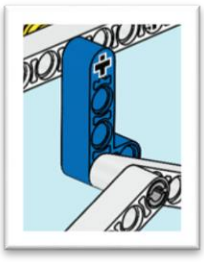
Once we have used the hand operated Magno Bird, we will take the handle off and use a string to allow the bird to "fly". By placing magnetic and nonmagnetic objects around we will be able to tell the strength of the magnetic force of an object by how far the Magno Bird dips down toward the objects it flies over.

MOTORIZED BUILDS:

The Walker

What a cool looking bug! This fun activity will employ gears, levers and ratchets as it walks forwards and backwards. Normally this guy is a slow mover. Students will learn how to increase the walker's speed by moving the position of the leg connection resulting in 3 different speeds.

Why would this make a difference in how fast the walker moves?



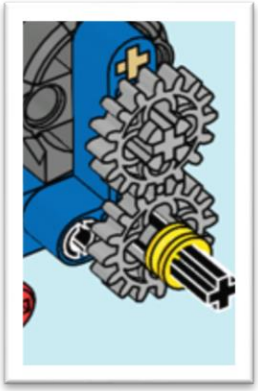
The lower the placement of the leg attachment the slower the speed of the walker. With the upward placement of the leg attachment, the smaller the circumference travels. The L shaped piece moves around in a circle.

What about the Ratchet? Why is it a very important aspect of the walkers' movement capability?

What do the ratchets do? The front feet cannot grip with the ratchet flipped the opposite way. Without the ratchets, the leg movements would force the wheels to roll backwards and forwards. The ratchet allows the wheels to roll one way.

The Power Car:

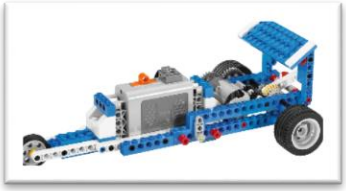
This activity is one of our students all time favorites! Gears are the focus of this build. How can we speed up the Power Car with out adding extra batteries and motors? We can change out the gears and the tires to acquire more speed. Your child will be able to tell you why this is important by the end of the activity. Of course, we have to race them to see which is the fastest!



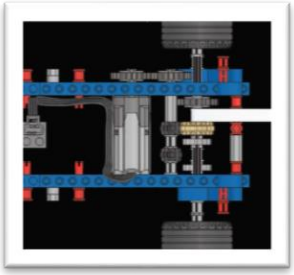
With a 1:1 gear ratio, speed can be increased using larger tires. Bigger tires have more friction with floor contact. By changing gear size , using a smaller gear on the motor and a larger gear on the axle we can greatly increase speed.

Our students really enjoy testing out theories and seriously silly large size tires. Too much fun!

The Gear Racer:



This is another exciting activity for your child to build! With this activity your child will continue to learn about gears by building a "gear box" and understanding a "gear shift".



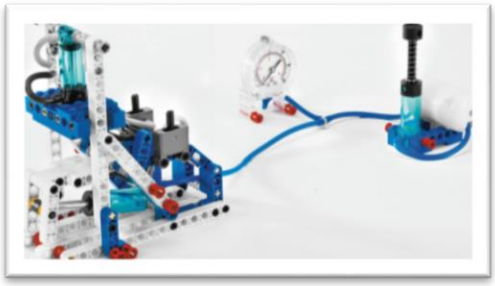
The gear racer actually allows the students to shift the gears back and forth while they gain an understanding of how a car can turn corners without losing power. Shifting gears back will let the car experience greater speed, just like the car their parents drive.

PNEUMATICS BUILDS:

Students will discuss what a Pneumatic powered machine is, how it uses pumps and compressed air molecules to move machines. The students will build basic models

demonstrating the principles behind pneumatics. In discussing the principle models, they will be learning about air flow, valves, air pressure, manometers and more.

The Robot Arm: While checking the manometer for any leaks after pumping air into the lines, your child can move the robotic arm to the left and right, up and down. As a challenge, students will operate the arm while using as little air pressure as possible. How about that? Your child will know how to control energy efficiency!



The Stamping Press: Again, we will be studying how energy efficient we can be using the stamping press. This machine is used to crush different materials. How much pressure did we use to crush the tin foil ball or the Play-Doh ball? How many times in 30 seconds can we move the stamper up and down, in and out?

We think you and your child will be glad they joined in the fun with Electrified and Robofied!