

## PARENT LETTER FOR TECHNO-SCIENCE FUN

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We have an amazing adventure guaranteed to challenge and inspire your child! We encourage predictions and imaginative solutions as we provide exciting challenges.

This camp is a combination of Science, Robotics and Technology. The technology information will follow the science.

Please note that the order may be different than below.

We are the OXYS: Only eXcellent Youth Scientist. We are defenders of the earth and amazing investigators. We have an arch enemy- Dr. Lipid who is always up to no good and we must stop his dastardly deeds! What is he up to now?

## SCIENCE PORTION OF TECHNO SCIENCE FUN

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### PART 1 INTRODUCTION AND VORTEX GENERATOR

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We will start with a **thunder tube** that will light up their eyes as they see how sound can be amplified.

Then, just to prove that waves can travel through the air even though we cannot see them, we will make a **vortex** that can knock cups down from across the room. Your child will make a smaller version to take home.

### PART 2 DRY ICE AND SUBLIMATION

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This is a show stopper! We have many fun activities that we use here such as:

- Singing Metal
- Freeze Frame
- Freeze Dried Balloon
- Cold Candle
- Bouncing Bubbles
- And Glowing Dry Ice

Ask your child what sublimation means. (Hint: A solid that goes directly to a gas, bypassing the liquid state.)

### PART 3 FLUORESCENCE

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We LOVE fluorescence at Imagine That! There will be so many oohs and ahhs we won't be able to count them! The children will join us in our glowing cave as we do some very cool experiments! As we dive deep into the ocean to seek out Dr. Lipid, we find that animals start glowing with Bioluminescence. Just how does that work? We will explore its close scientific relative fluorescence to find out!

Want to see how well the children clean their hands? Well, they can't hide their hitch hiking germs with our glow lotion!

We will teach about what hydrophilic means as we grow huge glowing eggs from just a tiny seed.

Don't be surprised if your child is glowing at the end of the day as we make invisible messages, sometimes on our skin!

Just to top it off with a little fun, we will have glowing bubbles.

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#### PART 4: SOUNDS LIKE FUN!

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We will explore how sound works and how our ears pick up on the sound with an exciting array of experiments. We have to use sonar to find the location of our Dr. Lipid's underwater lab. But first we must understand how sound can work to accomplish this mission.

Next we will explore **how we hear** with our model eardrum and special sound games.



Back to our sound amplification with some very exciting and funny experiments such as **a talking cup** and **screaming balloon**.

**Just how does sound travel?** We will explore with a sound symphony, sonar search and eavesdropping activities.

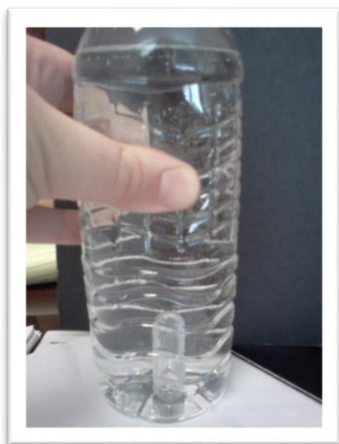
We will finish our Sounds Like Fun! Portion with an understanding of **frequency and resonance** with our strange band of Singing Bottles, Singing Tubes and Palm Pipes.

Whoever knows sound could be so much fun!

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#### PART 5: CARTESIAN DIVERS AND DENSITY

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The children will have a blast as they create and take home their own diver that must retrieve a sunken ship on the bottom of their mini ocean. They will learn about buoyancy, water molecules, hydrometers, water pressure and the force of air as they create their sub.

Students will also be introduced to the concepts of hydrophilic (water loving) and hydrophobic (water fearing) with some amazingly strange sand. Can they change the properties of hydrophobic materials? What did they use?

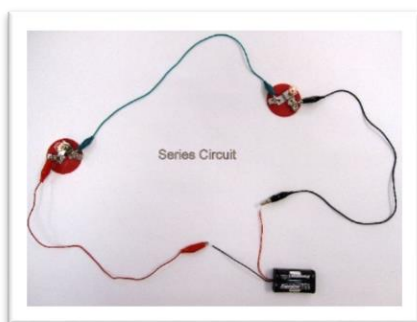
Can we use our submarine to reach Dr. Lipid's Lab?

## PART 6 ELECTRICITY AND MAGNETISM

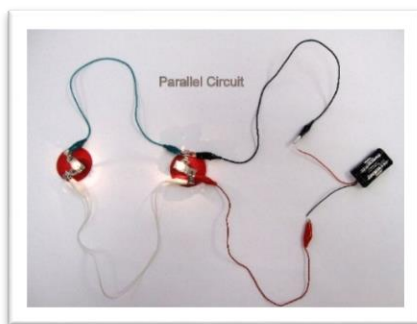
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We feel that the engineers on board our submarine need to know how to fix the electrical system if something goes wrong. We also may need to be able to make our submarine into a magnet. Can we do that?

Children always love magnets but we have some new and exciting twist. Can we make an object a permanent magnet then remove those properties? Have they ever seen Ferrofluid? Hmm, I don't think they will forget that one! How about the apparent science magic of an eddy current where things move in an unexpected time warp. The children will even make their own compass.



We will explore the relationship between electricity and magnetism. Do you know how electricity creates a magnetic field and how a charge moves down a wire? Be sure to ask your child at the end of this session. We will make an electromagnet and test how to improve its properties.



Do you think we can make a battery in an ice cube tray? We think we can!

We will investigate series and parallel circuits, make a fuse and test insulators and conductors.

We will make our kids hair stand on end with an electrostatic generator... Hmm and make paper to stick to a wall and make cans move.

Do you want to come to our camp with your child now?

## PART 7: FUN WITH NEWTON

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Ok, the laws may sound boring but the proof of the laws is not! We have amazing beads that defy gravity. But the favorite is our Potato Launcher! Don't let your child miss the fun!

## TECHNOLOGY, ROBOTICS AND PROGRAMMING PARENT SUMMARY

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### TECHNOLOGY AND ROBOTICS

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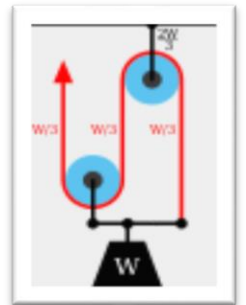
Your student's camp sessions of Lego® WeDos will be centered on learning the programming palette and understanding how each of the blocks affects the programming code while building the "Magic Carpet" activity. We will also be using the language of the elements; such as bushings, axles, gears, cams and such. The magic carpet will use the Pulley system in conjunction with Cam gears.

**What is a Cam? How does it affect the build?**

**Cam gear:** Usually an oblong shaped disk that will deliver a back and forth type of motion, such as "Up and Down".



**Compound Pulley:** This type of pulley is a combination of both the fixed and moveable axles thereby increasing the strength and ability of the lifting or moving power of the pulley.



In the following days, your student will build the "Magic Wand" as they learn all about the palette. With the palette, children can program using motor blocks, power blocks, sound blocks and timing blocks to create a program that makes the magic wand turn fast or slow.



They will program tilt sensors to activate the wand and timing blocks to turn the wand off!



**How does the wand spin?** Axles make the world go round!

Once your student has the basics down they will be encouraged to explore the programming palette while building a “Ninja Star”. With these activities, they will create their own program using sounds, visuals on the computers and their imaginations! We will have discussions on:



**Why does a spinning top spin?** A spinning top will defy gravity if enough force is used, causing it to stand vertical against the push of gravity.

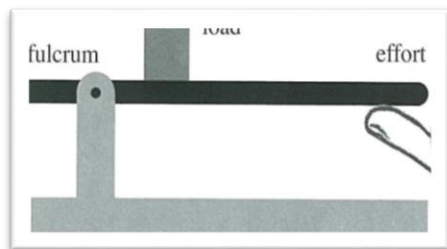
**What is Torque?** The measure of turning force on an object causing it to spin. A twist of force on an object.



Each of the activities employ the use of gears, some use pulleys and cams to enhance the builds capabilities. We will discuss the positions of the gears. Which one is the driver, idler or follower?



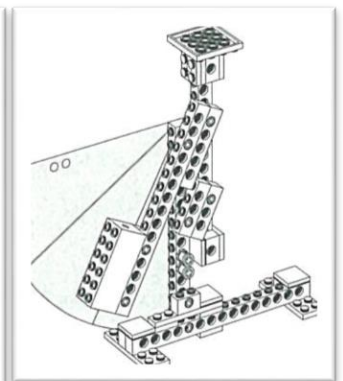
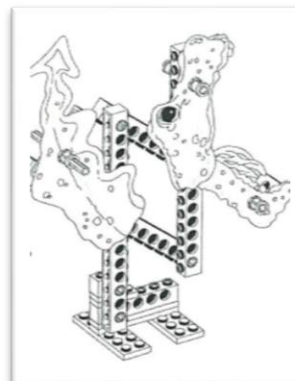
As the camp week continues your student will work with Lego® technic bricks to build a Scissor and a Balance. These two activities use the Lever simple machine.



We will start levers by understanding the Effort, Load and the Fulcrum (pivot point).

As they explore the levers,

additions to the builds can be added to create a biting alligator and a measuring machine.



## PROGRAMMING

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Scratch programming is a fun and entertaining way to learn more about the thought processes needed for clarity and precision to create productive command sequences. We know, it sounds like a mouthful! It's surprising to think that we use sequences of steps every day without even thinking about it, like, just getting out of bed!

Techno Science Fun will be a great week for your child that they will remember for a life time!