



SUMMER
CAMP

Gizmos & Gadgets

Grades: 3rd-5th

Each of the five days is set to three-hour periods. Depending on how much time is allotted you may extend or shorten times if needed, however, the set minutes are a good time frame.

Tested, edited &
approved by:

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Day One:

Introductions - 10 Minutes:

Have the entire group starting with the instructor state their name, age, and the favorite thing they have made before. Run through expectations for the kids throughout the week, such as listening skills, being a good friend, sharing, etc. This camp will involve building many devices, tools, or other objects. It will test the ingenuity of the kids and their handy skills.

Intro to the camp- 5 minutes:

explain to the kids what we are going to be doing throughout the week. It will include a lot of building, like stick bridges, catapults, robot hands, a roller coaster, and more. We will also be learning the science behind all of it. Ask the kids what are some things they might want to build during this camp. Some ideas will not be accomplishable but if they say something that you could do, you can do some of those projects later in the week.

Bridge video- 5 minutes:

watch this quick video to learn about how to make a bridge strong before we start building a bridge. Then have them start thinking about how they want to design their bridges. Split the group into teams of 2 before the next activity

<https://youtu.be/oVOnRPefcno>

Bridge building- 30 minutes:

The first thing we are going to build is a bridge, this will also be a competition to see which group can build the strongest bridge. Give each group 50 or so popsicle sticks and some glue. Give them 20 minutes to build this bridge, the only requirement is that it is at least a foot long, other than that they get to decide how they build it. After the time is up, put 2 tables about a foot apart to hold the bridge, then attach a bucket to the bottom and start adding rocks or other weight until the bridge breaks. Make sure to measure how much weight each one had to determine the winner.

Duct tape wallet- 30 minutes:

Some of the kids may have already done this activity before on their own time but we will be making a duct tape wallet. Use this link to see the instructions on how to make the wallet with pictures. When done the kids can use any extra time to design the wallet how they would like it. <https://frugalfun4boys.com/how-to-make-a-duct-tape-wallet/>

Game- 15 minutes:

let's take a break from the building to play a fun game. Go outside and play kids from Mars or another fun type of tag game. If you don't know what kids from Mars are, there will be a rectangle that the kids will run from one side to the other. The edges will be out of bounce. One or two kids will be it and stand in the middle, they will call a color or some sort of feature that the others are wearing or have and any kid that relates to has to run to the other side without the taggers getting them. For example, if they called out "if you are wearing green" then anyone that has green anywhere on their body has to run across.

Make a robot hand- 30 minutes:

This will be a fun activity that will allow the kids to make something that they can actually control and move around. To start, have the kids all trace their hands on the card stock including some of their wrists, you may want to have the adults use their hands though in order to have a larger hand to use, then cut out the hand. Place the back of the hand on the paper cut out and mark where each joint is located. Then fold the paper where those joints are. Cut the standard straws into sizes that will fit in between each joint with a little extra room for movement. Tape the straws on the hand and tape a jumbo straw on the wrist. Next, we will be putting the yarn through the straws, you will want 5 strands of yarn or string that are 2 feet long. Tie the yarn or string at the top so that it doesn't pull through the straws, you may need to tape it down



to the top of the finger. Once each finger has a string going through it and they all meet up through the wrist you can start pulling on them to move the fingers around. These strings are like the tendons in your hand that move your actual fingers around. Look at your wrist when you move your fingers and see if you can see your tendons moving around.

Stomp rocket- 20 minutes:

cut off the top of the bendy straw and then insert the pointy side into the juice pouch. Cut the second straw in half (this is the rocket). With the card stock, cut out some fins that will fit onto the straw and tape them on, doesn't matter how many they make or what size. Use a little clay to roll a little tip to put on the top of the rocket so no air gets in. Add other decorations on the rocket if you want. Blow up the pouch, put the rocket on the bendy straw and stomp on the pouch with the rocket pointed up. Don't point it at others

Balloon towers- 20 minutes:

This will be a fun competition for the kids. Split them into groups of two or three depending on the size of the group. Each group will have 20 a total of 20 balloons and one roll of tape. They have 15 minutes to make the tallest balloon tower that they can make and it has to be free-standing, it can not be leaning on the wall. When the time is up go around and measure the height of each group to determine a winner.

Use the rest of the time as needed to transition from station to station or use the extra time on other activities if the kids have not finished yet. If you have time still then play a game or make an origami object. At the bottom of the doc, you can find a website for origami if you need it.

Day Two:

Make a boat - 10 minutes:

This is a simple activity to get the kids started for the day and to have a little competition. Give each kid a piece of aluminum foil that is the same size, and give them 5 minutes to fold it into a boat. After the time is up, put it in water and add pennies or other coins to act as a weight and see whose boat can hold the most.



Make a roller coaster- 30 minutes:

to start watch this video to learn about roller coasters. <https://youtu.be/4oOXGIM2X2I>. For this they will get card stock and some cardboard, then they will have a marble that needs to be able to go through the roller coaster. Give them a normal piece of paper to draw a quick design on then once they have the design they can start building the roller coaster. You can split them into groups of two if you would like or have them work independently. Make sure that whatever they have planned they can build in the time frame.

Guitar- 30 minutes:

start by cutting a hole in the top of the box and the middle of the box, you will want these holes to line up with each other. Take some time to decorate the box before you start adding the rest together. Make small cuts into one end of the tube, then put the other side of the tube in the hole on the top of the box. Attach the tube with duct tape. Wrap rubber bands around from the top of the tube to the bottom of the box, use the cuts on the tube to secure the rubber bands, and tape them to the bottom of the box. Now it's done, compare how the different sizes of boxes that the others have might affect the sound, or take a small cup and wrap some rubber bands around the cup to hear the difference in noises they will make.

Game- 15 minutes:

take a break and play some tag games: things like zombie tag, freeze tag, normal tag, or any others just for fun.

Catapult- 30 minutes:

Build a normal spoon and stick catapult. Use this link for instructions <https://stlmotherhood.com/popsicle-spoons-catapult-challenge/>. After that use a cup or some object you can use as a target to aim at. Make a line then set up a target and give each kid 3 launches to see who gets closest. We will make a better catapult on day 4.

Egg drop- 30 minutes:

this will be another competition for the kids. See who can keep the egg from breaking, dropping it from 10 feet up. This will be completely up to the kids to build their own thing and not have any instructions. Give them all the same amount of supplies and give them 20 minutes to build the protective gadget for the egg. After the time is up, drop the eggs one by one to see who survives the drop.



Popsicle chain reaction- 20 minutes:

use this link to see the steps to make a fun long chain reaction with popsicle sticks, make it as long as you would like.

<https://www.stevespanglerscience.com/lab/experiments/popsicle-stick-chain-reaction/>

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Day Three:

Balloon-powered car - 30 minutes:

start with a paper plate, fold this plate or cut it and form it into whatever shape you would like. It can be stapled or taped down to keep the shape. This will be the body of the car. When the body is made, take some time to design it with markers. Take four bottle lids like from soda bottles or a milk jug, just make sure the four are the same size. Take a wooden stick and put a piece of straw over it, you want the stick to freely spin around in the end. Make a hole in the middle and connect 2 of the lids with a wooden stick, use hot glue to keep the stick on the lids. Tap the straw down to the bottom of the paper plate and repeat for the second set of wheels. Take a balloon and insert a straw about an inch into the balloon, then use a rubber band to wrap around the balloon to keep it on the straw. Make sure that the rubberband doesn't squeeze the straw too tight. Tape the straw down to the car and make sure that the end of the straw is going to the back of the car so that when the balloon releases that's where the air will come out and push the car.

Clothespin airplanes- 15 minutes:

discover a different way to make an airplane, and use the link to find the instructions to make the airplanes. <https://www.steamsational.com/clothespin-airplane-engineering-challenge/>

Paper airplanes- 15 minutes:

watch this quick video to see why airplanes fly before we make our own.

https://www.youtube.com/watch?v=QoTbgSSTB3E&ab_channel=eHowEducation. Now that we know why airplanes fly, let the kids make their own airplanes. You can use this



next link to see different kinds of paper airplanes or you can let them make their own and see who will fly the best. Compare the flight of the paper airplane and the flight of the wooden ones, which one goes farther? Why do you think that is?

Solar oven- 30 minutes:

let's make a snack. Take a pizza box and cut a flap on the top of the box. On the inside of the box glue black paper all over it to help absorb the heat. Glue aluminum foil to the part of the lid that you cut open to help reflect the sun into the opening of the box. Take plastic wrap and use it to cover the open part of the box to trap the air in it. If you would like you can let them decorate the rest of the box as they would like. On the inside of the box put your graham crackers with marshmallows and chocolate to make smores with the oven. Close the box and use a wooden skewer/stick to use to prop open the flap at the proper angle to heat up the smores. It will take some time to finish up so come back to it in about an hour or so to have your snack

Game- 15 minutes:

take another break to play some games. A fun game to play is ships and sailors, here is a pdf of the instructions on how to play. <https://young-catholics.com/wp-content/uploads/2022/02/Ships-and-Sailors-Game.pdf>. You can also add the command of "shark attack" where all the players that are out, run and try to tag the people still in. The players still in, need to run and touch a wall before getting tagged, if they get tagged by a shark they are out.

Invisible ink- 10 minutes:

let's make some invisible ink, start by mixing 1/2 cup of water with 1 tablespoon of baking soda. Use a cotton swab to write the message on the paper. While you let it dry make the reagent, the part that will reveal the message. Mix 1/2 cup rubbing alcohol with 1 teaspoon of turmeric. Now use the cotton swab to go over the papers and see what was written. Have the kids swap papers so the message is a surprise, and make sure that all messages are appropriate. When doing this project do it over a tablecloth or paper towels in case of a spill.

Lava lamp- 10 minutes:

to make a lava lamp start by filling the bottle $\frac{3}{4}$ of the way with vegetable oil. Fill the rest with water but leave some room at the top then add the food coloring. Next, break

the tablets into small pieces and add a piece or two at a time. Watch how it bubbles up and moves around.

Tower competition- 20 minutes:

This will be a fun competition for the kids to think about making towers again. Divide them up into teams of 2 or 3 and give each team 20 cups and 20 popsicle sticks. They will have to use these to build the tallest tower they can. Give them a few minutes to design how they will build this tower then give them 15 minutes to build it. When time is up go around and measure the towers to see who has the tallest one.

Candle carousel- 20 minutes:

To make this carousel start with a piece of cardboard as the base. Get a piece of colored paper and cut it into a circle with a radius of 4.5 cm. Draw a spiral on the circle going from the center out. Then using that line start cutting the paper. At the center make a triangular fold. Take a bamboo stick or wooden stick and glue it to the cardboard. Place the spiral paper on top of the stick and make sure that it can stand on the top without falling. Then add a candle to the bottom and when you light it, the carousel should start spinning.

Use the rest of the time as needed to transition from station to station or use the extra time on other activities if the kids have not finished yet. If you have time, then play a game or make an origami object. At the bottom of the doc, you can find a website for origami if you need it.

Day Four:

Trebuchets video- 5 minutes:

trebuchets are similar to catapults but work a little differently, watch this video that talks about trebuchets.

https://www.youtube.com/watch?v=W5RFoowvGkw&ab_channel=NatGeoKids

Trebuchets - 30 minutes:

This will be one of the more complicated builds of the camp so you may need more time for building than 30 minutes but we will just start with that. This link has the instructions and a picture of what to do and what it should look like in the end.

<https://www.scientificamerican.com/article/build-a-mini-trebuchet/>. Compare how this



trebuchet compares to the catapult we made the other day. Which could launch farther or more accurately?

Popsicle stick house- 20 minutes:

this activity will be entirely up to the kids to decide how to build it. Give them all the same number of sticks and have some hot glue to share and let them be creative and build their very own popsicle stick house. If you want you could even give prizes to the best looking ones.

Build a maze- 20 minutes:

for this activity, we will let the kids be creative again. Give each kid a square of cardboard and some wooden toothpicks. Use hot glue or tape to put the sticks on the cardboard. Have the kids draw out their own maze on the cardboard with a pencil or marker and when they are done and are sure there is a way out of the maze start putting the sticks down on the lines to make it 3-D. When everyone is done, have them go around to each other and see if they can escape each other's mazes.

Game- 15 minutes:

for today's game have an obstacle course already set up somewhere. Line the kids up and have them go through one at a time. Record the times it takes for each kid to see who comes out on top. To make it more interesting, have things that could count as penalties and add time to their score. If you don't want to set up an obstacle course, then you can play other games like tag or anything you or the kids can think of, this is just to give them a break.

Balancing bird- 15 minutes:

use this pdf to print out the template for the balancing bird. Use different weights to see how it balances differently and try to see who can figure out why it balances and doesn't fall down.

https://www.exploratorium.edu/sites/default/files/files/TinkeringStudio_BalancingBird_Toy.pdf

Balloon hovercraft- 15 minutes:

Take a bottle cap and make a hole in the top of the cap. Put hot glue on the edge of the bottle cap and stick it over the hole of the CD. let it cool and then put the balloon over the cap, wrap a rubberband around the cap to keep the balloon secure on the cap.



When you are ready blow up the balloon from the other side of the cd and put it on a flat hard surface to watch it float

Rainstick- 15 minutes:

take the paper bag and cut two big circles out for each tube. If you would like the paper to add aesthetics to the rainstick you can crumple it up a little and make little cuts on the sides. Take one circle and wrap it around one end of the tube and use a rubber band to secure it down. Then experiment with different ways to fill the rainstick. Some ways are to twist up the pile cleaners into spirals with different sizes and put them in the tube. Another way is to use the metal craft wire and twist it into spirals and put in the tube as well. Then use the rice, beans, or beads, or mix them around and hear what they all sound like. Once you have your favorite and are ready to go you can put the second circle of paper over the top and put the rubber band on, then tie some different colors of yarn on it to add some color.

Rubber band car- 30 minutes:

This website gives good instructions and pictures to help you to make the car. When you are done play around with the cars and decorate them if you would like. Compare how these move compared to the balloon cars that we made earlier. What works better, rubber bands or balloons? <https://figmentcreativelabs.com/2018/02/rubber-band-car-diy/>

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Day Five:

Make a Birdhouse - 30 minutes:

To start the day we will make a homemade birdhouse. In the supplies, I have listed everything you need to make a ½ gallon birdhouse. This link has instructions for how to build one, and it also has a few other options for other birdhouses to build._

<https://fabpartyplanningmom.com/homemade-birdhouses-for-kids/>



Rain Gauge- 15 minutes:

start by taking your bottle and at the point where the bottle gets to the full width, cut the top part off. Take the part that you cut off, flip it around with no cap on, and put it back into the bottle upside down. It should be able to sit on top and not fall to the bottom, this will act as a funnel. Put some pebbles in the bottom of the bottle as weight so that it will stand up better. Take a piece of tape and make it straight from the top of the bottle to the bottom. Draw a line on the piece of tape just above the pebbles. Take your ruler and line it up so that the 0 is where you make that first mark. Use the ruler to mark whatever increments of measurement you would like. Fill up the bottle with water until it reaches the 0 mark. Now your rain gauge is ready.

Sundial- 15 minutes:

let's continue with the theme of weather and make a sundial so we can tell time with the sun. First, take a ruler to find the center point of the paper plate and mark it. Take your pencil and stick it through the center. If possible mark the plate at 12 o'clock, if the camp isn't going at that time then you might want to have it set up before then. Once you make that mark on the plate label it 12 and then label a 3,6, and 9 line every 1/4th of the plate. Take the plate outside and try to line it up with what the time is, leave it there, and go back to it later to see if the sundial is an accurate way to tell time.

Duct tape water bottle holder- 20 minutes:

This is another fun craft you can make with just duct tape. Duct tape can be used for a lot of things other than just holding things together. Use this link to see the instructions on how to make the water bottle holder with pictures to help you through the process. When done the kids can decorate it however they want to make it their own.

<https://www.sarahjanescraftblog.com/2013/08/duct-tape-water-bottle-holder.html>

Game- 20 minutes:

For the last game of the camp we will be doing a quick Blaze pods tournament. Make a bracket and try to split them up into competitive groups to make it more fun for them. Depending on the size of the camp we can do a double elimination bracket or a losers bracket of just the kids from the first round.

Make a top- 15 minutes:

Start with the heavy washer and if you would like to in some way you can decorate the washer with paper or markers or something to make it a little more fun. Place the craft



bead in the center of the washer and make sure it is in there snug. Glue the bead to the washer with hot glue and let it sit. Make sure the holes of the bead are centered so that you can see them and be able to stick the skewer through. Put the skewer through the hole when the glue dries and trim the skewer to the ideal length. Glue the skewer to the bead so it doesn't move on you when you play with it. Once that is done drying you can now play with the top and see who can spin theirs the longest.

<https://www.wikihow.com/Make-a-Spinning-Top>

Rube Goldberg Machine- 45 minutes:

A Rube Goldberg machine is a complex machine that is designed to complete a simple task by going through a long series of chain reactions. Here are some examples of Rube Goldberg machines, ours might not be as complicated as some of these are but it will help give them the idea.

https://www.youtube.com/watch?v=qybUFnY7Y8w&ab_channel=OKGo,

https://www.youtube.com/watch?v=xHrYypDKXTc&ab_channel=Hevesh5,

https://www.youtube.com/watch?v=OHwDf8njVfo&ab_channel=KellyDunn

Now that the kids have seen some examples, it's time to make our own. Come up with some ideas to make with the materials that you have and design the path of how you are going to make things happen. The most important thing is figuring out what you are going to accomplish in the end. Remember that these take patience and time and it might not work on the first try.

Use the rest of the time as needed to transition from station to station or use the extra time on other activities if the kids have not finished yet. If you have time still then play a game or make an origami object. At the bottom of the doc, you can find a website for origami if you need it.



Supplies: (Unless stated in the activity, each project is done by each child, so the number of items depends on the size of your group.)

- Day One
 - Bridge building
 - Popsicle sticks
 - Glue
 - Bucket
 - Rocks or another form of weights
 - Duct tape wallet
 - Duct tape
 - Scissors
 - Ruler
 - Knife
 - A board to cut on
 - A card for sizing
 - Markers
 - Robot hand
 - Standard drinking straws
 - Jumbo sized straws
 - Card stock
 - Scissors
 - Yarn or string
 - Tape
 - Stomp rocket
 - Empty juice pouch
 - Bendy straw from the juice pouch
 - Normal straw
 - Card stock
 - Tape
 - Molding clay
 - Balloon tower
 - Balloons
 - Tape
 - Tape measurer

- Day Two



- Make a boat
 - Aluminum foil
 - Coins
 - Bucket with water
- Build a roller coaster
 - Card stock
 - Cardboard
 - Tape
 - Marble
- guitar
 - Cardboard box
 - Cardboard tube
 - Scissors
 - Rubber bands
 - Duct tape
- Catapult
 - Popsicle sticks
 - Spoon
 - Rubberbands
- Egg drop
 - Eggs
 - Straws
 - Sponges
 - Tape
 - Coffee filters
 - String
 - Paper towels
 - Plastic bags
 - Anything else you think would work good for this project
- Popsicle chain reaction
 - Popsicle sticks
- Day Three
 - Balloon-powered car
 - Balloon
 - Rubberband
 - Straw
 - Wooden sticks

- Bottle lids
 - Hot glue
 - Paper plate
 - Markers
 - Tape
- Clothespin airplane
 - Wooden clothes pins
 - Popsicle sticks (jumbo might work best)
 - Scissors
 - Hot glue
 - Markers
- Paper airplanes
 - Paper
- Solar oven
 - Pizza box
 - Glue
 - Aluminum foil
 - Tape
 - Black paper
 - S'mores products
 - Wooden skewer/stick
- Invisible ink
 - Rubbing alcohol
 - Baking soda
 - Paper
 - Water
 - Turmeric
- Lava lamp
 - Bottle with lid
 - Vegetable oil
 - Alka-seltzer tablet
 - Food coloring
 - Water
- Candle carousel
 - Candle
 - Bamboo or wooden stick
 - Colored paper

- Scissors
 - Hot glue
 - Pencil
- Day Four
 - Trebuchet
 - Popsicle sticks
 - Scissors
 - Pencil
 - Jumbo straw
 - Hot glue
 - Tape
 - Rubber bands
 - String
 - Paper clips
 - AA battery (or another weight source)
 - Popsicle stick house
 - Popsicle sticks
 - Hot glue
 - Prizes for best-looking houses (optional)
 - Build a maze
 - Cardboard
 - Wooden toothpicks
 - Hot glue or tape
 - Balancing bird
 - A printer to print the pdf
 - Scissors
 - Coins, paperclips, and other weights to add
 - Balloon hovercraft
 - Balloon
 - CD
 - Bottle cap with a hole in it
 - Hot glue
 - Rubberband
 - Rainstick
 - Sturdy cardboard tube
 - Brown paper grocery bag
 - Yarn



- Rubberbands
 - Scissors
 - Pipe cleaners and craft wire
 - Rice, beads, beans, and anything else you might want
- Rubber band car
 - Toothpick
 - Hot glue
 - Rubber bands
 - Scissors
 - Straw
 - [Woodpile Fun sticks](#) 3.15"x 0.16" sticks
 - Popsicle sticks
 - 2" cardboard wheels with a hole in the center
 - 2 bolts
 - 4 nuts
- Day Five
 - Homemade birdhouse
 - ½ Gallon Cardboard Juice Carton
 - Popsicle sticks
 - Acrylic Paint in preferred colors
 - Paintbrush
 - Glue Gun
 - Glue Sticks
 - Scissors
 - Glitter
 - Circular Handheld Hole Punch
 - 6-7" Stick from outside
 - [Twine](#)
 - See the link in the instructions for other birdhouse options
 - Rain gauge
 - Clear plastic bottle (2 liter works best)
 - Scissors
 - Masking tape
 - Marker
 - Ruler
 - Pebbles or another weight source
 - Sundial

- Paper plate
- Pencil
- Marker
- Ruler
- Duct tape water bottle holder
 - Duct tape
 - Markers or other things to decorate the holder
- Make a top
 - Heavy washer (the bigger and heavier, the longer the top should spin 1½-2¼in)
 - Craft bead
 - Hot glue
 - Wooden skewer
- Rube Goldberg Machine
 - Dominos
 - String
 - Marbles
 - Tracks
 - pencils/pens
 - Tennis balls
 - Any other things you could think of to use, be creative

<https://www.origami-fun.com/origami-instructions.html>

