

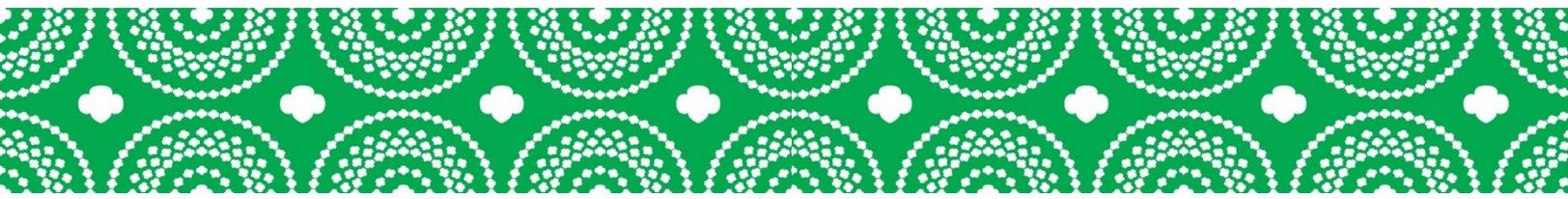
Valero Energy Foundation



Girl Scout Cadettes

Girl Scouts of Southwest Texas
811 North Coker Loop
San Antonio, Texas 78216
(210) 349- 2404 or 1-800-580-7247
www.girlscouts-swtx.org

To learn more about Valero Energy
Foundation and their mission, visit
www.valero.com





About

[Valero Energy Foundation](#)'s story is unique in corporate America. Named for the mission San Antonio de Valero, the original name of the Alamo, Valero Energy Foundation was created on January 1, 1980, as the corporate successor to LoVaca Gathering Company, a subsidiary of the Coastal States Gas Corporation. Valero Energy Foundation is the direct result of a \$1.6 billion settlement approved unanimously in 1978 by the Texas Railroad Commission, the state's natural gas regulatory agency, which ended more than 6 years of litigation brought against Coastal by its municipal gas customers who claimed they had been overcharged for natural gas.

Valero Energy Foundation's natural-gas transportation business diversified in the mid 1980's when the company purchased a 50% interest in a Corpus Christi, Texas, refinery owned by Saber Energy. The operation began as nothing more than a vacuum unit and crude unit on a humble plot of land near the Corpus Christi Ship Channel, but in the years that followed Valero Energy Foundation assembled its "Refinery of the Future" and added 16 more refineries to the fold starting in 1997. Through these acquisitions, the company also branched into retail and wholesale markets and continues to operate under the Valero Energy Foundation, Diamond Shamrock, Shamrock, Ultramar, and Beacon brands.

Today, Valero Energy Foundation proudly has a work force of approximately 10,000 employees and maintains a refining output capacity of 3 million barrels per day. The company is a [Fortune 50](#) company, still based in its hometown of San Antonio, and is North America's largest independent refiner. Valero Energy Foundation is also a leading ethanol producer with 11 ethanol plants in the Midwest and a combined capacity of 1.3 billion gallons per year. Valero Energy Foundation also operates a 33 turbine wind farm near its McKee Refinery in Sunray, Texas.

Valero Energy Foundation maintains a strong commitment to safety and stands as one of the most recognized refiners within the federal OSHA Voluntary Protection Program (VPP). The company demonstrates its commitment to excellence in occupational safety and process safety through an intensive, detailed Commitment to Excellence Management System. And it continues to be recognized among the world's top refining and marketing companies, and among the nation's best employers.

In the community, Valero Energy Foundation is proud of its legacy of support and positive outreach through an international network of Volunteer Councils. Valero Energy Foundation Volunteers proudly dedicate more than 136,000 volunteer hours to community outreach annually. Special missions on behalf of the United Way, the National Multiple Sclerosis Society, Wounded Warriors and countless children's charities are a source of pride and motivation for every Valero Energy Foundation employee. Valero Energy Foundation, its employees and its philanthropic organization – the Valero Energy Foundation Energy Foundation – annually generate more than \$38 million to support worthy charities or causes, through direct donations or fundraising, to improve the lives of those living in communities near Valero Energy Foundation operations.

Valero Energy Foundation proudly carries its legacy of strength and stability in the refining industry and into each community touched by its operations. Through the years, the company has amassed a family of employees from virtually every corner of the energy business. Their expertise and dedication continue to make Valero Energy Foundation a competitive partner in the global energy industry.

Girl Scouts of Southwest Texas &
Valero Energy Foundation
are proud to bring to you the...
Valero Energy Foundation
STEM Patch Initiative



The need for skilled science, technology, engineering and math (STEM) professionals is ever-growing. Though traditionally male-dominated, women are having a greater impact in these areas than ever before. In this initiative girls will push boundaries, test limits and look at the world through inquisitive eyes. Whether they're building a robot, learning the needs of a car's engine or creating a chemical reaction, girls are moving forward into the future.

Girl Scouts of Southwest Texas and Valero Energy Foundation are proud to announce the Valero STEM Patch Partnership. In hopes to spur creative problem solving in our everyday lives, Girl Scouts of Southwest Texas and the Valero Energy Foundation are coming together in the Valero STEM Patch Partnership.

Girl Scouts who complete the Valero Energy Foundation Curriculum can work on a variety of projects, everything from engineering paper helicopters to learning about speed and friction.



Steps to Earn the Valero Energy Foundation STEM Cultivating Knowledge Patch

Girl Scouts is the premier girl leadership development program—girls have fun with a purpose! All activities are girl-led and girls should decide what activities to complete when earning a Business Patch Initiative (BPI) patch. In the spirit of Girl Scouting, girls may choose to participate in activities that are not listed in the booklets and/or supplements. If girls complete the minimum required number of activities based on the theme of the BPI, they have earned the BPI patch. For more information, contact Larissa Deremiah at lderemiah@girlscouts-swtx.org.

Step One:

1. Read through the Activities
2. Think about what you would like to do
3. Choose 3 out of the 4 Units
4. Complete 2 Activities from the 3 Units you chose

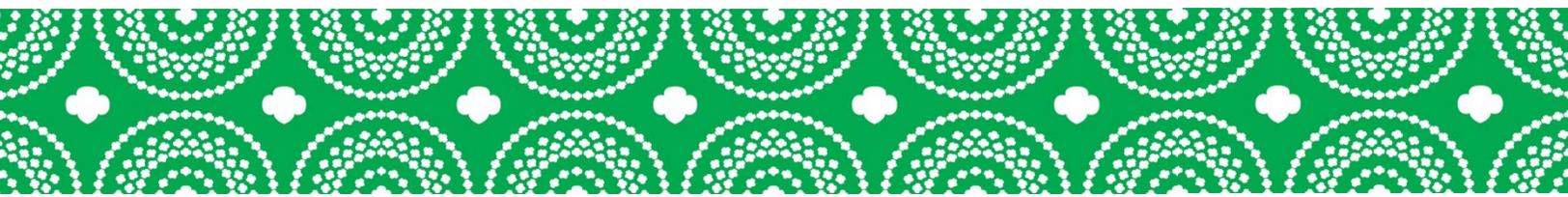
Step Two:

1. Complete the [Business Patch Initiative \(BPI\) Evaluation](#)
2. For more information, contact:
Girl Scouts of Southwest Texas
ATTENTION: Program
Phone: (210) 319- 5775
Toll Free: 1-800-580-7247
Fax: (210) 349- 2666
lderemiah@girlscouts-swtx.org



Step Three:

1. Receive your Valero Energy Foundation STEM Patch!



The Girl Scout Leadership Experience

Girls at every level of Girl Scouting participate in the “*leadership experience*.” A *leadership experience* is an exciting way of working with girls in a series of themed activities focused on building leadership skills. By enlisting the three keys to leadership (*Discover, Connect, and Take Action*) girls learn that they can take the lead to make a difference in their community and the world. The three keys are at the heart of the Girl Scout philosophy of leadership:

Discover

Girls understand themselves and their values and use their knowledge and skills to explore the world.

Connect

Girls care about, inspire, and team with others locally and globally.

Take Action

Girls act to make the world a better place.

It’s not just “what” girls do, but “how.” When girls are engaged that creates a high-quality Girl Scout leadership experience. All Girl Scout experiences are built on three processes (*Girl-Led, Cooperative Learning, and Learning by Doing*) that make Girl Scouting different from school and other extra-curricular activities. When used together, these processes ensure the quality and promote the fun and friendship so integral to Girl Scouting.

Girl-Led

Girls play an active role in the planning and implementation of activities while adults provide age-appropriate facilitation, ensuring that planning, organization, set-up, and evaluation of all activities are done jointly with the girls.

Cooperative Learning

All members of a group work together towards a common goal that can only be accomplished with the help of others.

Learn by Doing

A “hands-on” learning process that engages girls in cycles of action and reflection resulting in deeper understanding of concepts and mastery of practical skills.

When Discover, Connect, and Take Action activities are girl-led and involve learning by doing and cooperative learning, girls achieve the desired and expected leadership outcomes ultimately resulting in Girl Scouting achieving its mission: Building girls of courage, confidence and character, who make the world a better place.



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SCIENCE

Science: Clean Water Using the Sun

Can you think of a way of cleaning dirty water using the Sun? How about getting salt or bacteria out of water using the sun? In this activity, you will be making a 'solar still' which is able to do just that!

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. A wide plastic basin/bowl
2. A smaller jar or glass for collecting the clean water
3. A large piece of transparent plastic, plastic wrap/cling film works
4. A small stone
5. String or rubber band to hold plastic in place
6. Salt

Directions:

1. Using the bowl mix some salt and tap water together.
2. Take a small taste of salt and water mixture.
3. Place the collecting jar in the middle of the bowl. Make sure the water is below the height of the collecting jar.
4. Cover the bowl with the plastic wrap, making sure that it's secured tightly at the edges by using a piece of string or rubber band to create a seal.
5. Place a stone in the middle of the plastic wrap just above the collecting jar.
6. Carefully move your solar still into the sun and let it sit for about half an hour.
7. After the solar still has been out in the sun for a while, return to it and record your observations.
8. After a few hours, when you take your solar still apart, taste the water in the collecting jar. What happened? Did you notice drops of water appearing on the inside of the plastic? Where did they come from?
9. Try to think about and describe the two changes of state that have occurred to the water retained in the collecting jar.

Teachable Moment:

Think about cooking noodles on the stove. When the stove is turned on, eventually the water will come to a boil, some of the water evaporates up and the noodles stay in the pot. Now instead of noodles think salt and instead of using the heat from the stove we are using the heat from the sun. The sun heats up the water in the basin until it evaporates and leaves the salt at the bottom of the basin just like noodles are left in the pot. All contaminants are gone! When the water evaporates, it rises up but since we put the plastic wrap over the basin it cannot leave the basin. Therefore, the water is forced to collect on the bottom side of the plastic wrap. The water vapor that is collected will condense to liquid water when is on the plastic wrap. This process from going to a gas back to liquid water is called condensing. When the water condenses on the underside of the plastic it will eventually run towards where the stone is, in the middle. Eventually there will be too much water to stick to the plastic wrap and it will fall into the collecting jar drop by drop! Now you will have a jar of clean water and a bunch of salt leftover in the basin. Drink up!

Do you think this method could be used to turn sea water into drinking water? What are the advantages and disadvantages of this method?



Science: Barometer

Technology can make life easier but there are always things in life that are out of our control, like the weather. Wouldn't it be great to be able to predict the weather? You'd never get caught in a rainstorm without an umbrella! Weather affects your life every day, use this activity to build your own technology for predicting and planning!

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. A balloon
2. A large baby-food or similarly sized jar
3. A heavy-duty rubber band
4. A straight drinking straw
5. A piece of cardboard
6. Scissors
7. Glue
8. A marker
9. A ruler

Directions:

1. Cut a large section from the balloon and stretch it tightly over the mouth of the jar.
2. Wrap the rubber band around the balloon so that it is secure.
3. Cut one end of the drinking straw into a point.
4. Lay the straw across the top of the jar.
5. Glue the non-pointed end of the straw to the center of the balloon.
6. Fold the piece of cardboard so that it will stand up next to the jar.
7. Mark where the pointed end of the straw touches the cardboard.
8. Draw a line and label the line "5."
9. Use a ruler to draw 10 lines, 3 millimeters apart, 5 above and 5 below the line labeled "5" and label the lines 0 to 10. Make sure that the straw is pointing at "5."

Teachable Moment:

Check the straw over the next week, observe the position of the straw and record the changes. Be sure to check your barometer at approximately the same time every day. What is the weather like when the straw points to a lower number? What is the weather like when the straw points to a higher number? If a high pressure system is on its way, often you can expect cooler temperatures and clear skies. If a low pressure system is coming, then look for warmer weather, storms and rain. How will altitude affect the air pressure?

Alternative Activities:

Learn about different types of weather maps (example: precipitation and winds)
Visit your area's [National Weather Service Forecasting Office](#)
Scientific American: [New Technology Allows Better Extreme Weather Forecasts](#)

Science: Become a Scientist

More men enter the fields of science, technology, engineering, and mathematics than women do. Women continue to be underrepresented in the fields of science, technology, engineering, and math, collectively referred to as “STEM.” Women’s representation is low at all levels of the STEM career pipeline, from interest and intent to majoring in a STEM field in college to having a career in a STEM field in adulthood.

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. Parent/guardian permission

Directions:

1. Interview or visit with a female scientist.
2. Find out how she became interested in her field.
3. Who encouraged her to pursue science?
4. Where did she find information about the field that she was interested in?
5. Which people are the most supportive of her in her job?
6. Reflect on how this information has affected you.

Teachable Moment:

Explore the world around you, ask questions and look for answers; don’t limit yourself. Don’t be afraid of math and science, you are probably better at it than you think. Talk to people about STEM careers and get as much advice as you can, but always do your own research, too. Register for a fun program to learn more about STEM, there are great opportunities in many communities. Make the world a better place and achieve a Girl Scout Silver Award using STEM.

Alternative Activities:

[Stained Glass Earth](#)

[Female Pioneers in Science](#)

[Generation STEM](#): What Girls Say about Science, Technology, Engineering, and Math (2012)



TECHNOLOGY

Technology: Building a Macro

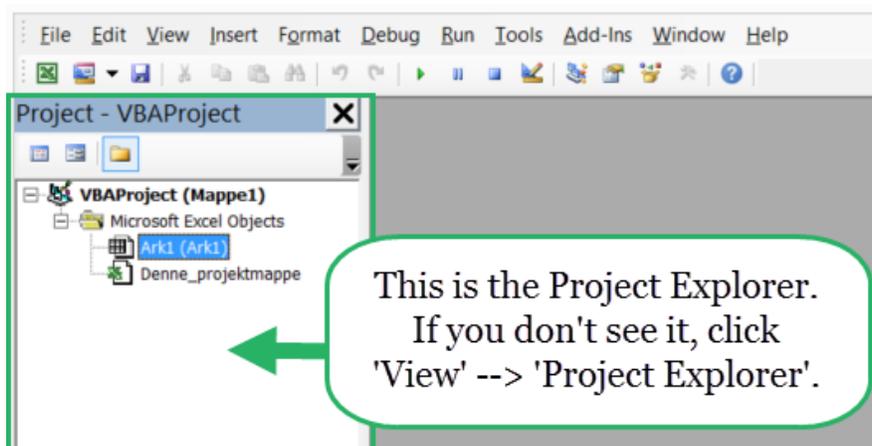
Spreadsheets are infinitely flexible—especially in Excel. You most likely already use functions that add, average, and calculate your values. They're what make spreadsheets a powerful tool for crunching numbers and text. Macros are the next step: They're tools that automate simple tasks and help you get more done in less time.

Materials:

1. A computer with Microsoft Office (Excel)

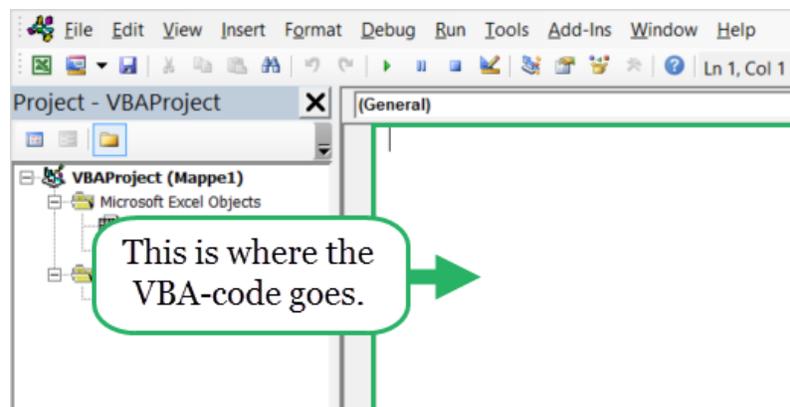
Directions:

1. Open the VBA (Visual Basic Editor) by clicking `Alt + F11`— this is where you'll edit and store all your macros.



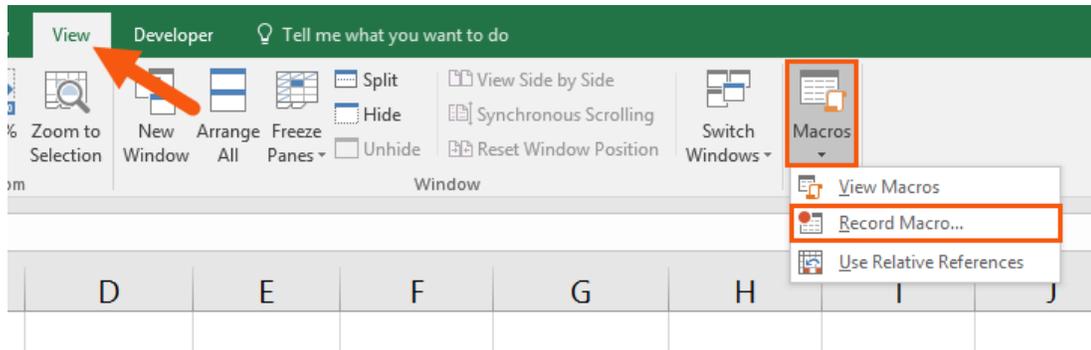
*** Be sure to keep the project pane open so you can easily edit your macros. Macros are made up of “Modules” or files with VBA code.*

2. You will add a new module or open an existing one in the VBA editor, then type the code you want.
 - a. To insert a module, click “insert” and then click “module”. You'll then see the blank space to write your code on the right.

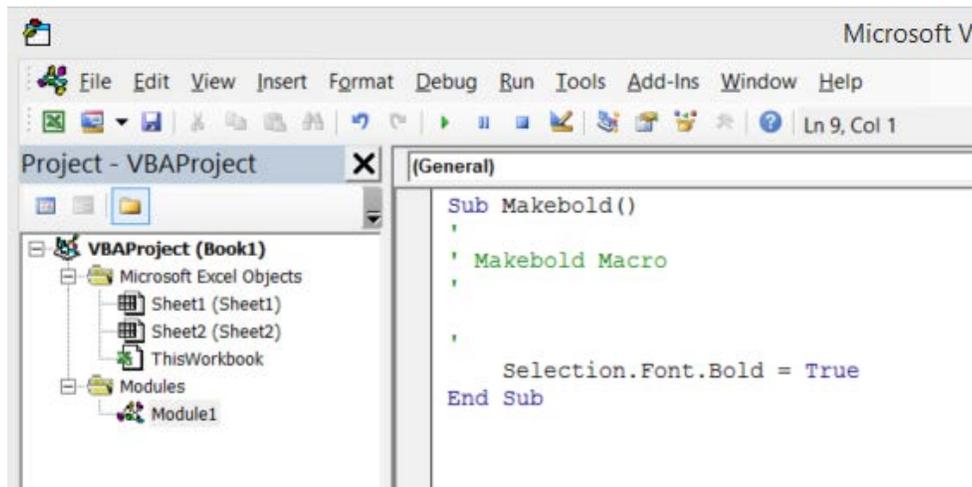




3. Record your macro:
 - a. Go to the “View” tab of the ribbon and click the tiny arrow below the “Macros” button.
 - b. Click “Record Macro”
 - c. Type the name of your macro and click “OK” to start recording.
 - d. Perform the actions in your spreadsheet you want to be turned into a macro.
 - e. Go to the “View” tab, click the tiny arrow below the “Record Macro” button again and select “Stop recording”.



4. Use shortcut **Alt** + **F11** to open the VBA Editor, and double-click “Module 1” in the Project Explorer. You will see your first code!



Teachable Moment:

That’s how you record a simple macro. The real power of macros comes when you can write your own. Excel macros have only one problem: they're tied to your computer, and they can't run in the [Excel Web App](#) or on your mobile device. And they're best at working on data already in your spreadsheet, making it difficult to get new data from your other apps into your spreadsheet.

Alternative Activities:

- [Watch Recording Macro Tutorial](#)
- [Code You Own Macros](#)

Create your own budget for you Girl Scout Silver Award using Excel

Technology: Simple Machines

A machine is a device that uses a force to move something or do work. Simple machines include screws, pulleys, wedges, levers, inclined planes, wheels and axels. Find out how simple machines have changed your life.

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. Parent/guardian permission
2. Computer and internet access

Directions:

1. Participate in a scavenger hunt where you find at least 2 examples of simple machines. Discover simple machines both indoors and outdoors.
2. Use at least 3 simple machines to put together a piece of equipment that will perform a job.
3. Build a compound machine that combines 2 or more pieces of equipment and simple machines.
4. Explain the purpose of your compound machine and how it works.
5. Teach someone to use your compound machine.

Teachable Moment:

Rube Goldberg was a famous cartoonist who lived between 1883 and 1970. His life was spent creating art and sculptures, but his most famous work was for his "inventions." These inventions were a series of simple machines put together in a complex fashion to accomplish something very simple, but it took many steps to get there. Contests have been run for many years since Mr. Goldberg first created his unique ideas. In the contests people try to come up with new ways to turn on a light, or start a toaster using these combinations of the simple machines to wow judges and audiences for their unique way of doing these simple tasks. Make your own Rube Machine!

Alternative Activities:

[Simple Machines](#)

EdHeads: [Nano Entrepreneurship](#) or check out what other teens are [inventing!](#)

Research and build your own [Rube Goldberg machine!](#)



Technology: Create an App *

Technology can make life easier. We use apps every day to do so, but there are always things in life that are out of our control and need a solution. Wouldn't it be great to create your own app to solve the problem at hand? Here you will learn about the invention process and design your own app to help your community.

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. Writing utensils such as pens and markers
2. Cardstock/ Bristol board – note cards will also work

Directions:

1. Student Inventors Activity: Students brainstorm issues in their community and decide if creating an app can help address the issue.
2. Research the issue further and answer the following questions:
 - a. Decide where to find more information on your issue.
 - b. Is there an expert you can speak to about your issue?
 - c. Will you be able to use technology to help solve the issue?
3. Use your research to invent your app.
 - a. Follow the keys to the [inventions process](#).
4. Complete the four components of an invention plan:
 - a. Write a one-page plan for your app.
 - b. Sketch, model or build a prototype of your app.
 - c. Create a flowchart depicting how the app will work.
 - d. Create an [App Store](#) page – include screen shots.
5. Present your project.

Teachable Moment:

There are many things to consider when building an application that can affect how successful it will become. Think “better safe than sorry.” In this case your application has the best chance to succeed when all parts are considered instead of throwing something together just to get a working model.

Alternative Activities:

Complete the Girl Scouts of Nation's Capital [IP Badge](#)

Play the [AgrInnovation](#) Card Game

*** For more in-depth material and instructions go to:**

"Lesson Plan: Invent an App That Helps Your Community." *PBS Newshour Extra*, PBS.org, 30 May 2017, www.pbs.org/newshour/extra/lessons-plans/lesson-plan-using-gaming-and-technology-to-find-solutions-in-agriculture/.

Accessed 30 Aug. 2018.

ENGINEERING



Engineering: Rubber Band Powered Car

Energy can be found everywhere – in Valero gasoline or even in a rubber band! As you stretch a rubber band, the energy from the motion of stretching is stored in the rubber band while it is still held apart. When you release the rubber band, the stored energy is converted to energy in motion, and the rubber band shoots together. The “stored energy” is called potential energy, and the “energy of motion” is kinetic energy. In this activity, experience how you can power a car using the kinetic and potential energy of a rubber band! Don’t try to put Valero gas into this car though!

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. 1 piece of corrugated cardboard (about 6”x6”)
2. 2 thin wood kitchen skewers
3. 1 plastic straw
4. 2 paper clips
5. 4 CD’s
6. Rubber bands
7. Tape
8. Ruler and meter stick
9. Scissors

Directions:

1. Cut a notch into the center of one of the sides of the cardboard 1½ inches deep and 2 inches wide. This side will be the back of your car.



2. Take the notch you just removed and cut it into four equally sized pieces.
3. Take one of the small cardboard rectangles you just made and tape it to the CD so that it covers the hole in the middle of the disk. Do this to all four CDs.
4. Using the scissors, carefully poke a small hole in the middle of the cardboard on the CD wheels.
5. Cut the straw into four, 1-inch pieces and tape the pieces in the corners of the underside of your car. Make sure the front and back axles (skewers) can easily fit through the corresponding straws.
6. Stick the skewers through the straw pieces so that each goes through two pieces. The skewers will act as the axles of the car and allow the wheels to rotate.

Engineering: Rubber Band Powered Car (cont.)

7. Poke the skewers through the holes in the CD tires and cut off the extra length, allowing half an inch of the skewer to stick out of the tire. Tape the axle securely to each tire. You should now have a car with a body, two axels, and four wheels.
8. Tape a paper clip securely to the top of the car in the middle 2 inches down from the front of the car, but only tape one of the hooks. Allow the other hook of the paperclip to lay on top of the tape and hook the rubber band to this part of the paper clip.
9. Take the other paper clip and place it in the notch of the back axel. Tape the paperclip securely so that the skewer is in the middle of the clip.
10. Place the free end of the rubber band over the paperclip and start to pull the car backwards. You are now converting kinetic energy to potential energy as the rubber band wraps around the axel and stretches.
11. Let go of the car! Your car will be powered forward by the rubber band as its potential energy (stored energy) is quickly converted to kinetic energy – the energy of motion!

Teachable Moment:

Energy cannot be created or destroyed – it can only be transferred between different forms. However, the energy in the rubber band is not completely converted into the motion of the car. What is another force that *steals* energy from the car?

Try using rubber bands of different lengths and widths and see what type has the most energy!

Alternative Activities:

Design Squad: [Water Dancing](#)
[Rubber Band Powered Car](#)

Try out one of these cool [games](#)!

Engineering: Chemical-Powered Rocket



On September 13, 1959, man landed on the moon. They got there by using a rocket propelled by chemical reactions. In this activity, you'll use a chemical reaction to create your own rocket. Just remember to be safe and try to keep your rocket on Earth.

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. Safety glasses
2. Funnel
3. 1 cup of Vinegar
4. 1 tablespoon Baking Soda
5. Paper towel (single-ply)
6. Plastic bottle (1 liter or 16 fl oz)
7. 3 pencils (new)
8. Duct tape
9. Scissors
10. Cork or rubber stopper (big enough to plug bottle)

Try changing the amounts of baking soda and vinegar. What happens?

Directions:

1. Put on your safety glasses. You don't want to get any of this in your eyes!
2. Use your scissors to cut about a foot of duct tape.
3. The pencils are the legs of the rocket. Stick one end of the tape to the middle of the bottle, taping each of the pencils to the side of the bottle as you wrap it around. Try to tape them so that they are equally spaced around the bottle and they each extend about 2 inches past the bottle opening. Check to make sure your rocket stands up and is stable.
4. Use the funnel to fill the bottle about half-way with vinegar.
5. Get a single paper towel and tear it into squares that are about 5-6 inches on each side. Exactness isn't important here. The towel needs to be single-ply, so if there are multiple layers, peel them apart so you only have one layer.
6. Choose one of your paper towel squares and lay it flat. Measure out 1 heaping tablespoon of baking soda and pour it in the middle of the paper towel. Wrap up the baking soda tightly in the paper towel so that it looks like a little hot dog. It needs to fit easily through the bottle opening.
7. Take your bottle, baking soda, and cork or rubber stopper outside to your launch pad. You're almost ready for lift-off.

Engineering: Chemical-Powered Rocket (cont.)

8. When you're ready to launch, perform the following steps as quickly as possible, and be sure to stand clear of the rocket!
 - a. Push the baking soda packet through the bottle opening
 - b. Plug the bottle tightly with the cork or rubber stopper
 - c. Give the rocket a quick shake
 - d. Set the rocket upright on the pencils
 - e. Get back!

Teachable Moment:

The rocket is propelled by pressure. The pressure is made by a reaction between vinegar and baking soda that creates carbon dioxide gas.

- Try changing the amounts of backing soda and vinegar. What happens?
- How do you think using a different size bottle would affect the experiment? For an extra challenge, try using a larger bottle. What did you see?

Alternative Activities:

Learn more about an [Air-Powered Rocket](#)

Build your own [Zip Line Carrier for a Marble](#)

Design Squad: [Packaging Engineer](#)



Engineering: S'mores Cooking in a Solar Oven

Heat, such as that from the sun, is a form of energy. When more energy or heat goes into a box than can come out, the box gets hotter. This is how a solar oven works to cook food. It captures the sun's energy/heat and traps it resulting in the box to heat up and cook the food. In this experiment you will create your own solar oven and cook s'mores.

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. Cardboard box (preferably small and flat like a pizza box)
2. Pencil
3. Ruler
4. Box cutter or scissors
5. Aluminum foil
6. Clear tape
7. Black paper
8. Plastic wrap or a large transparent bag
9. Newspaper
10. Oven Mitt
11. Aluminum foil dish or pie plate
12. Thermometer that goes to 250°F
13. 2 wooden skewers
14. S'mores food items: marshmallows, chocolate, graham crackers

For a group project, you can form multiple teams and see which team can build the hottest oven.

Directions:

1. Draw a square box on the top of your box at least 1" from the edges and big enough to fit your aluminum foil dish or pie plate.
2. Use your box cutter to cut along three sides of the box you drew. Be careful to always cut away from you and to watch where your fingers are positioned.
3. On the uncut side, make a crease so that the new box can be opened like a door.
4. Cut a piece of aluminum foil and cover the inner side of the box door that was cut in step 2.
5. Cover the inside bottom of the pizza box with black paper.
6. Cut two pieces of plastic wrap a little bit bigger than the box door. These will be used to cover the door to make it air tight.
7. Roll up some newspaper and place around the sides for insulation. Try to fill as much of the open unused space with newspaper as possible. The more

Engineering: S'mores cooking in a Solar Oven (cont.)

insulation will result in less heat loss. Remember to save room for your aluminum dish and food.

8. Now it is time to cook. Place your s'more on the aluminum dish with graham cracker first, then marshmallow, and lastly with chocolate on top. Leave off the second (top) graham cracker until the chocolate has melted.
9. Add plastic that was cut in step 6 and tape over door opening to close off the box. Ensure it is air tight.
10. Place oven in direct sunlight. Between the hours of 11am to 2pm work best.
11. Attach wooden skewers to lid and top of box to hold the lid of the door open and direct the sun rays onto the s'more.

Teachable Moment:

What is happening? The heat from the sun is trapped inside of your pizza box solar oven, and it starts getting very hot. Ovens like this one are called collector boxes, because they collect the sunlight inside. As it sits out in the sun, your oven eventually heats up enough to melt cheese, or cook a hot dog! How does it happen? Rays of light are coming to the earth at an angle. The foil reflects the ray and bounces it directly into the opening of the box. Once it has gone through the plastic wrap, it heats up the air that is trapped inside. The black paper absorbs the heat at the bottom of the oven, and the newspaper make sure that the heat stays where it is, instead of escaping out the sides of the oven.

By lining your oven with black construction paper, you can preheat the oven for other recipes such as garlic toast or hotdogs. You can even try recipes like baked potatoes, rice and vegetables and more.

Alternative Activities:

Make your own [Sun Clock](#)

Understand how the sea level rises with your own [Thermal Expansion Model](#)

Use your new understanding of solar power to create [Solar Powered Car](#)



MATHEMATICS

Mathematics: Budget for a Fun Night Out

In this activity you will plan for a night out within a given budget. Budgeting is a plan on how to spend your money. Creating a budget allows you to determine in advance if you have enough money to do the things you need or would like to do. It also allows you to set goals to save for future purchases or emergencies.

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. Paper and pencil
2. Calculator

Directions

1. Determine the amount of budget you want to set for the fun night out.
2. Write down ideas of a fun night out. Your ideas must be very specific and organized (i.e. movie, exact food items, etc.).
3. Find out the exact cost of each item on the list. For example, if one activity is to have a McDonald's happy meal, call to find out the cost.
4. Now that you have a list of activities with the cost of each one next to each activity. Look up the sales tax for your area.
5. Now your fun night has been officially planned, you are ready to do the math!
6. Take each activity and determine the cost of it, but this time including the sales tax, if applicable.
7. Figure out how much you will have left over so you will know how much you have saved!
8. Check your math.

Teachable moment:

Budgeting allows you to:

- Have control of your money and spending
- Stay focused on your money goals and avoid unnecessary spending.

Budgeting requires three things: 1.) knowing how much money you spend, 2.) knowing your saving goals, and 3.) managing your money. Always remember that take action and higher awards projects should be affordable. Be resourceful and look for alternative resources to avoid unnecessary costs. How cost effective can you make your [Girl Scout Silver Award](#) project?

Alternative Activities:

Create your own budget for a [Girl Scout Silver Award](#) project

Calculate a Road Trip or international [travel](#) ETA (i.e. estimated time of arrival)

Design your own playground and draw to scale



Mathematics: Cookie Time

Unit conversions are important to know and are used in everyday life. Have you ever lost a measuring cup or spoon and cannot complete your favorite recipe? Or found a great recipe from another country in different units? Or wanted to create the recipe for more or less people? This lesson will teach you how to convert your recipes so that they turn out delicious.

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. Favorite Recipe (see below or choose your own)
2. Measuring cup and spoons
3. Oven- may require parent/guardian permission

Recipe: Betty Crocker's Chocolate Chip Cookies

Ingredients from original recipe (serving 24)	Serving for 12	Serving for 36
$1\frac{1}{2}$ cups butter or margarine, softened		
$1\frac{1}{4}$ cups granulated sugar		
$1\frac{1}{4}$ cups packed brown sugar		
1 tablespoon vanilla		
2 Eggs		
4 cups all-purpose flour		
2 teaspoon baking soda		
$\frac{1}{2}$ teaspoon salt		
4 cups Semi-Sweet Chocolate Morsels		

- How can we adjust the recipe to accommodate more or less people?
- What mathematics is needed for cooking? (multiplication and division)
- What do we need to do to increase the number of servings? (multiply)
- What do we need to do to decrease the number of servings?

Mathematics: Cookie Time (cont.)

Directions:

1. Determine how much of each ingredient is needed if you are making this recipe for 12 people and 36 people. Complete the table above.
2. Choose to make the recipe for 12 or 36 people.
3. Heat oven to 350°F. In large bowl, beat butter, sugars, vanilla and eggs with electric mixer on medium speed or with spoon until light and fluffy. Stir in flour, baking soda and salt (dough will be stiff). Stir in chocolate chips.
4. On ungreased cookie sheet, drop dough by tablespoonfuls 2 inches apart. Flatten slightly.
5. Bake 11 to 13 minutes or until light brown (centers will be soft). Cool 1 to 2 minutes; remove from cookie sheet to cooling rack.

Note: Keep in mind that when adjusting recipes in the real-world, that we do not always need to measure to the exact amount, as it sometimes makes more sense to round to the appropriate amount. For example, 15/16ths of a tablespoon would be realistically 1 tablespoon. Also, spices may not increase at the same rate. For example, a dash of pepper may still be a dash of pepper.

Teachable Moment:

We can measure weight, time, height, temperature, speed and so much more – like the measurements for the ingredients of the cookies. Measurements make life easier and sometimes need to be converted when measurements change with or without notice.

Basic Conversion rule:

- If you need to convert from a LARGER unit to a SMALLER unit you MULTIPLY.
- If you need to convert from a SMALLER unit to a LARGER unit divide.

Alternative Activities:

Push you limits with [Tunnel Construction](#)

What is the measurement problem in [Cyberchase](#)?

Mathematics: Graph the Stars



Graphs are made up of 4 quadrants on 2 perpendicular axes (x and y). Many astronomers use graphs to chart the stars. Use this activity to find a constellation and create your own constellation challenge!

Materials: Number and variety of materials is contingent on the number and desires of the girls.

1. Graph paper
2. A ruler
3. A pencil

Directions:

1. Draw a graph with all 4 quadrants, both the x and y axis should range from -10 to 10.
2. Chart each coordinate in order and connect the preceding coordinate with a line to the following coordinate.

f. (-8, -3)	j. (4, -2)
g. (-6, 0)	k. (7, 0)
h. (-2, 1)	l. (6, 3)
i. (1, 0)	
3. Find the slope of at least 3 of the lines.
4. Create your own constellation for your troop/group.
5. Can you recognize the constellation?

Teachable Moment:

A slope is how steep or flat a line is. The slope of a line can be determined by the slope formula:

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

For more of a challenge, convert your coordinates into lines by using the slope-intercept formula:

$$y = mx + b$$

Interesting slopes:

$m=0$, is a flat horizontal line

$m=1$, is line that steps up by 1 on y and x axis. Coordinates are (0,0), (1,1), (2,2), etc.

Alternative Activities:

[Write Your Own Story](#)

Use a Graphing Calculator

Design a Pre-Calculus Dragonfly

YOU DID IT!



CONGRATULATIONS!



For More Information

Valero knows that being a good operator also means being a good neighbor. The company demonstrates its commitment to all of its communities through a variety of philanthropic efforts, volunteer activities and educational support programs. For the second year, Valero made the list of America's 50 most community-minded major companies – [The Civic 50](#). Valero is the only energy company in the top 50, recognized for its commitment to improve the quality of life in communities where it does business.

Overall in 2014, Valero and its philanthropic organization generated more than \$38 million for worthy charities or causes, through direct donations or fundraising. Always a leading supporter of the United Way as a two-time national Spirit of America Award winner, Valero and its employees pledged more than \$11.2 million to the United Way in 2014, for donations in 2015, including a company match – up nearly 6 percent from the year before. The company raised \$10.4 million for children's charities across the United States in 2015 through the [Valero Texas Open](#) and Benefit for Children.

Valero established the Valero Volunteer Council in 1983, and each location still has a council serving its local communities. Valero employees log more than 130,000 volunteer hours each year for hundreds of community projects. Valero is a strong supporter of food banks wherever it operates, sponsoring several food drives each year. Since 2008, Valero has collected approximately 400,000 pounds of food for the [San Antonio Food Bank](#), plus many thousands more at other locations. Valero Volunteers additionally have built numerous [Habitat for Humanity](#) homes throughout Valero's communities.

Valero is a strong advocate of education and contributes to programs, agencies or organizations that share the same focus. The Valero mentoring program is a top priority of our Valero Volunteer Council and management. For more than 10 years, the program has helped school children in schools across the country. There are various events and programs, including school-supply and uniform drives held at the end of summer to help students start the new school year, as well as "Career Days" at area schools, and tours.

Valero supports many worthy military organizations including [Fisher House](#), Warrior Support Foundation, Operation Comfort, Operation Homefront, Marines Helping Marines, Vietnam and World War II veterans' museums, Returning Heroes Home, local VFWs, National Museum of the Pacific War and the National Committee for Employer Support of the Guard and Reserve. For the 10th consecutive Thanksgiving Day, about 400 members of the U.S. military in 2014 were treated to a traditional holiday meal at headquarters, while 175 Valero Volunteers and their families served food and entertained their young military guests.

For more information, contact the [Valero Energy Foundation](#) Corporate Headquarters at (210) 345- 2000.



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End of Booklet

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To learn more about Valero Energy
Foundation and their mission, visit
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