girl scouts of southwest texas

VALERO ENERGY FOUNDATION

Valero Energy Foundation

Girl Scout Brownies

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

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VALERO ENERGY FOUNDATION

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.

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Steps to Earn the Valero Energy Foundation's STEM 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 (total 6 activities)

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's 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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Table of Contents

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SCIENCE

Science: Magnet Hunt

Try these activities to see how wonderful science is! The changes may seem like magic, but a scientist can make them happen. You get to be the scientist!

Materials: Number and variety of materials is contingent on the number and desires of the girls. You will need materials that will demonstrate a variety of physical properties.

1. A magnet.
2. Objects you may find in nature, such as rocks, twigs, leaves, shells, bark, cones, etc.
3. Objects you may find at home, such as paperclips, spoons, hair brush, glasses, etc.

Directions: Magnets pull some objects to them. Most magnets are made of iron and come in many different shapes. Get a magnet and find out what will stick to it!

1. Take your magnet and touch it to as many different objects as you can find.
2. Create a chart of the objects you touched your magnet to and check off if the magnet was attracted or was not attracted to each object.
3. Determine why your magnet was attracted to some objects and not to others.
4. Share your results with your troop/group.

Teachable Moment:

In most materials, electrons spin around. These spinning electrons are in pairs that have each electron spinning in an opposite direction, which has a cancelling effect. These pairs of electrons are scattered throughout the materials. In magnets, not all of the pairs of spinning electrons cancel each other, so the electrons line up to form a magnetic field. Because of the magnetic field, magnets are special materials that are attracted to each other and other materials such as iron. The earth is a giant magnet!

Alternate Activities:

How Do Magnets Work?
Magnets and Springs
Make Your Own Compass

Science: Presto Change-o

Try these activities to see how wonderful science is. he changes may seem like magic, but a scientist can make them happen. You get to be the scientist!

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

1. Skim milk
2. Lemon juice (fresh or from concentrate)
3. A small glass jar
4. A tablespoon
5. Toothpick
6. A piece of paper
7. A lamp

Directions:

1. Fill the glass jar with 5 tablespoons of skim milk.
2. Slowly add lemon juice a drop at a time to the milk, stir between each drop.
3. What happened to the milk?
4. Make invisible ink with the lemon juice by using the toothpick as a pen and the lemon juice as the ink.
5. Wet the tip of the toothpick with the lemon juice. Write a message on the piece of paper with the toothpick.
6. Allow the paper to dry.
7. Warm the paper over a lamp bulb.
8. What happened to your message?
9. How is this different from what you saw happen when you added lemon juice to the milk?

Teachable Moment:

Acids are chemicals that taste sour, are corrosive to metals, and become less acidic when mixed with bases. Bases are chemicals that feel slippery and become less basic when mixed with acids. Acids and bases interact chemically. The milk is a base and the lemon juice is an acid. The juice of most fruits contains carbon compounds, these compounds are colorless at room temperature but heat breaks down the compound and releases the carbon into the air through a process called oxidation.

Alternative Activities:

Lemonade Fizzy Drink
It's Alive! Yeast experiment
Diet Coke and Mentos Geyser

Science: Static Electricity

Try these activities to see how wonderful science is. The changes may seem like magic, but a scientist can make them happen. You get to be the scientist!

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

1. 5 balloons
2. String
3. Very small pieces of paper
4. Wool cloth

Directions:

1. With an adult, blow up the balloons and tie off the ends.
2. Rub a balloon very quickly on a wool cloth or your hair.
3. Hold the balloon over the very small pieces of paper. What happens?
4. Take 2 more inflated balloons and tie a piece of string to each one.
5. Rub the balloons on the wool cloth or your hair.
6. Hold the balloons by the string and try to make them touch. What happens?
7. Rub another balloon on the wool cloth or your hair.
8. Hold the balloon next to a thin stream of water from the faucet. What happens?
9. Rub another balloon on the wool cloth or your hair.
10. Hold the balloon up to the wall; did you have enough of a static charge for the balloon to stick to the wall?

Teachable Moment:

A special kind of electricity, called static electricity, can be made by rubbing some things together or creating friction. Lightning is a type of static electricity caused by a spark of moving electrons racing up or down between a cloud and the ground. The spark you sometimes feel when you touch something after walking on a rug is static electricity. Experiment by trying to make your own static electricity.

Alternative Activities:

Separate Salt and Pepper
Bend Water with No Hands
Make Your Own Lightning

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TECHNOLOGY

Technology: Computer Language

Learning how to use a computer is fun. The computer can help bring your ideas to life with words, pictures, colors, and numbers. You need to take care of your computer by keeping it safe from food and spills. Learn the meaning of some special computer words and you will have an easier time communicating in our world of technology.

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

1. Parent/guardian permission
2. Computer

Directions: Do your own detective work to learn the meanings of the words listed below.

1. Software
2. Program
3. Database
4. Hardware
5. Icon
6. Font
7. Memory
8. Find new computer words to learn!

Teachable Moment:

Using technology and a computer is a perfect opportunity to learn by doing. Write your own stories, create a fun party invitation, design a presentation for your parents; the possibilities are endless! The important thing to remember is that a computer is a resource that is utilized in everyday life and achieving computer literacy will help you become a better student and help you achieve your dreams. Always ask a parent/guardian to help you learn about a computer, applications, and programs.

Alternative Activities:

Download an app and play it! (preferably an age-appropriate literacy game)
Stop Cyber Bullying
Internet Safety Pledge

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Technology: Technology Hunt

Technology is a way of using science to create tools that make life easier for people. Go on a technology hunt to discover just how important technology is to your everyday living!

Materials: No materials are necessary; feel free to draft your own scavenger hunt for friends and family! Number and variety of materials is contingent on the number and desires of the girls.

Directions: Find as many examples of technology at work on the list below.

1. Something made of plastic.
2. Something made from trees.
3. Something that moves in a circle.
4. Something that uses a switch.
5. Something made of metal.
6. Something that uses wheels.
7. Something that measures.
8. Something that makes sounds.
9. Something that uses electricity.
10. Something that is run by computers.

Teachable Moment:

Modern technology has benefitted human beings by increasing production of goods and services, reducing the amount of labor needed to produce these goods and services, and providing a higher standard of living. Technology may sometimes have negative effects on society. Think about ways to use technology to stop environmental pollution and depletion of natural resources.

Alternative Activities:

Make a Rain Gauge
Try one of these Make and Take Activities!
NANO WORLD

Technology: Water Filter

Technology is a way of using science to create tools that make life easier for people. Less than 2% of earth's water supply is fresh water and only 1% of the earth's water is available for drinking. Use this activity to inspire technological advancements towards providing the world with more fresh water!

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

1. 2 jars or similar containers
2. A flat surface
3. A raised platform such as a stack of books
4. Tea or colored water
5. Length of paper towel or cloth towel

Directions:

1. Fill one of the jars about 3/4 full with the tea or colored water. Place that jar on your platform such as a stack of books.
2. Place your empty jar next to the platform directly on the flat surface.
3. Dampen the length of paper towel or cloth towel. Tightly twist the length of paper towel or cloth towel. Soak the twisted length of paper towel or cloth towel.
4. Place one end of the length of twisted, wet length of paper towel or cloth towel into the tea or colored water. Place the other end into the empty jar.
5. You've built your own water filter!

Teachable Moment:

The water travels from one jar or container to the other because of capillary extraction. The water molecules are attracted to the molecules in the paper towel, chemists call this cohesion. As the water moves through the paper towel, it is gradually filtered. Gravity helps speed up this process when the empty jar is lower than the full jar.

Alternative Activities:

Balloon Speakers
Make Your Own Magnifying Glass
Robotics on the International Space Station

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ENGINEERING

Engineering: Strengths of Shapes

Making sure that a building will not crumble is an important part of what engineers and architects do. They experiment with materials and shapes to see how much weight they can hold. Use this activity to try this yourself!

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

1. Paper
2. A small stone, coin, or button

Directions:

1. Hold a single sheet of paper by an edge so that it is straight over the floor.
2. Place a small stone, coin, or button on the paper. What happens?
3. Fold the paper into quarters like a book and hold the paper by an edge so that it is straight over the floor.
4. Place a small stone, coin, or button on the paper. What happens?
5. Make a fan out of a sheet of paper.
6. Balance the small stone, coin, or button on the fan. What happens?
7. Experiment with other shapes to find the best way for paper to support an object.

Teachable Moment:

The flat piece of paper does not have enough strength to hold the object. The paper folded into quarters has more strength because you have changed its shape. The fan will support the object; you have added strength to the paper by corrugating it or by folding the paper back and forth. An engineer created this way of making paper stiffer and stronger. What other ways to we use corrugated paper? Have you seen real life bridges that resemble the paper fan?

Alternative Activities:

Geometry Playground: The geometry of fitting things together
Finding the Strongest Shape
Try one of these activities! Exploratorium: Structures Around the World

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Engineering: Design a Meeting Place

Architects, engineers, and decorators design buildings and other spaces. You can have fun learning about how museums, airports, libraries, and other structures are designed, built, and decorated with this activity!

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

1. Paper
2. Pencil
3. Ruler
4. Play Dough

Directions:

1. Imagine the perfect meeting place for your troop/group.
2. Consider all of the activities that you would like to do.
3. Draw a picture, create a sketch, or build a model of what this ideal meeting place would look like.
4. There are no wrong answers, so if you would like an indoor pool then include it!
5. Share your drawing, sketch, or model with your troop/group.

Teachable Moment:

Engineers solve practical problems by applying mathematical and scientific knowledge. The word engineer comes from a Latin word meaning "cleverness." Branches of engineering include aerospace, biomedical, chemical, civil, computer, electrical, environmental, forensic, genetic, mechanical, military, nuclear, reverse, software, and structural.

Alternative Activities:

Build a Paper Bridge
DiscoverE: The world needs more engineers!
Ice Breaker

Engineering: Loop-de-Loop

Motion is the act of an object changing position. Motion is measured in quantities of speed, acceleration, and velocity. Sir Isaac Newton discovered 3 basic ideas that applied to the physics of most motion. These ideas have been tested and verified so many times that scientists now call them Newton's 3 Laws of Motion.

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

1. A large outdoor space
2. 1 long rope at least 24 inches long
3. 1 pail or bucket with a handle
4. 1 soft, small ball
5. Water

Directions:

1. Choose a large outdoor space to avoid the risk of hitting anyone.
2. Tie the rope securely to the handle of the pail or bucket.
3. Insert the ball into the empty pail or bucket.
4. Hold the pail or bucket by the rope and whirl the pail or bucket around in circles in the air as fast as you can.
5. Try step four with water in the pail or bucket.
6. You are a magician!

Teachable Moment:

The ball and the water should remain in the pail or bucket, even when it is upside down, because of centrifugal force. Centrifugal force is the force created by the whirling motion. When the pail or bucket is whirling fast enough, the centrifugal force equals the force of gravity. The ball and water are pulled to the sides of the pail or bucket rather than down and out of it. Where else can you find centrifugal force in action?

Alternative Activities:

Ball-in-Cup Contest
Basketball Arcs
Paper Frog Race (search online to find out how to make your own origami frog)

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MATHEMATICS

Mathematics: Can You Guess

Did you know that you use math every day? When you count money, or measure your height and weight, or tell time, you are using math. This fun activity will help you become more comfortable with making mathematical estimations.

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

1. A large jar with a lid
2. Seeds, beans, or marbles

Directions:

1. Fill the large jar with the seeds, beans, or marbles and close the jar with the lid.
2. Ask at least 5 people to guess the number of objects in the jar.
3. Record their guesses.
4. Ask them how they made that guess and record their answer.
5. Let them pick up the jar if they ask.
6. Did anyone make a close guess?
7. Now it is your turn to guess or estimate amounts. Have a friend fill the jar with something different and try to estimate the amount!

Teachable Moment:

Estimation is a critical component of number sense. If you want to estimate rather than guess, you have to use a strategy. A good estimate is one that is reasonable and relatively easy to compute. The best estimate is not always the one that is closest to the exact answer. Would it have been easier to estimate the amount from the jar if you could count the number of objects in one handful and calculate how many handfuls remained in the jar? Try to identify appropriate situations for estimation.

Alternative Activities:

Connect 4
How Many Pizzas for Your Party?
"A Million Fish... More or Less" by Patricia C. McKissack

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Mathematics: Alphabet Code

A cipher is a secret or disguised way of writing a message; you may call it a code. Historically, cipher actually meant to "do arithmetic" or math. Use this activity to explore how you can use math to turn your message into a unique cipher!

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

1. Paper
2. Pencil

Directions:

1. Write down the letters of the alphabet.
2. Next to each letter put a different number from 1 to 26. You don't have to write them in order.
3. Use your code or cipher to send a secret message to a friend who knows the code.
4. Encode your message more by writing equations or formulas for the number in your code!

EXAMPLE: E=3, T=5, M=1, S=8
8531 or 4+4, 6-1, 2+1, 3-2

Teachable Moment:

The golden ratio is approximately 1.618 between two quantities and often appears in nature. It has been used throughout history to create art. Fibonacci numbers are named after Italian mathematician Leonardo of Pisa who introduced them to Western Europe after they had earlier been described by Indian mathematicians. They are related to the golden ratio and proceed in the following order: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, ... Can you see the pattern?

Alternative Activities:

Riddle: which month has 28 days? (make your own riddle!)
Arithmetic Race
Fizz, Buzz, Pop

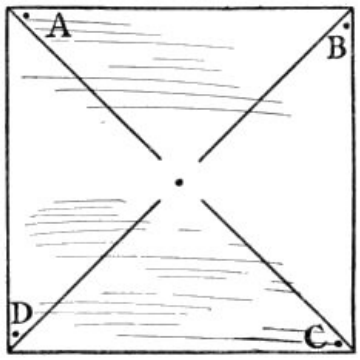
Answer: STEM

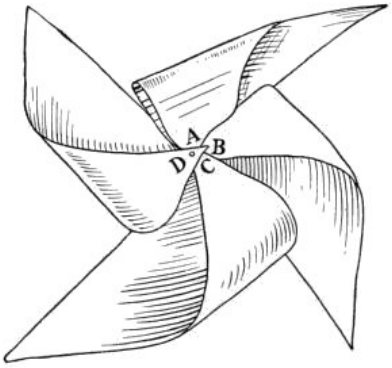
Mathematics: Pinwheel

Just like a windmill, a pinwheel uses wind energy to make it spin. Make your own pinwheel using your math skills to see how a pinwheel works. Don't forget to keep your ruler close by for this activity!

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

1. Construction paper
2. A ruler
3. Scissors
4. A straight pin
5. 2 beads
6. A pencil with an eraser





Directions:

1. You will cut out a square from the construction paper. Each side of the square should be 6 inches in length.
2. Using the ruler, draw a straight line from one corner to the opposite corner of the square. Do the same for the other two corners.
3. Make a cut 2 inches long along each of the lines from the corner toward the center of the square.
4. Slide a bead onto the straight pin.
5. Fold the four blades as shown above, but don't crease the folds.
6. Pass the straight pin through the center of the pinwheel; this will hold the four blades together.
7. Slide the other bead onto the straight pin.
8. Stick the straight pin into the side of the eraser on your pencil.

Teachable Moment:

We measure almost everything, we use feet and inches to measure our height, pounds to measure our weight, and years to measure our age. There are 365 days in 1 year. Using your current age, try to estimate or measure how old you are in the number of days. Identify other ways that we use measurement.

Alternative Activities:

Fraction Flags or make your own fraction flag design!
Play Caterpillar Count or make a DIY Placeholder Caterpillar
Down The Tubes

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brownies

YOU DID IT!

CONGRATULATIONS!

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VALERO ENERGY FOUNDATION

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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