Solar Powered

GSWCF Council Patch Program

Purpose:

When I have earned this patch, I will understand how solar energy works, why clean energy matters, and how it powers homes and communities. I will explore careers in solar and environmental science with TECO and discover how I can take action to support a cleaner, brighter future for our world.

Steps:

1. What is Solar Energy
2. TECO's Solar Story
3. Why Solar Matters
4. Solar Power's Impact on Our World
5. How I Can Take Action

TECO TAMPA ELECTRIC AN EMERA COMPANY | girl scouts of west central florida

STEP 1

What is Solar Energy?

Solar energy is power we get from the sun. The sun gives off light and heat and we can use special tools to turn that sunlight into electricity!

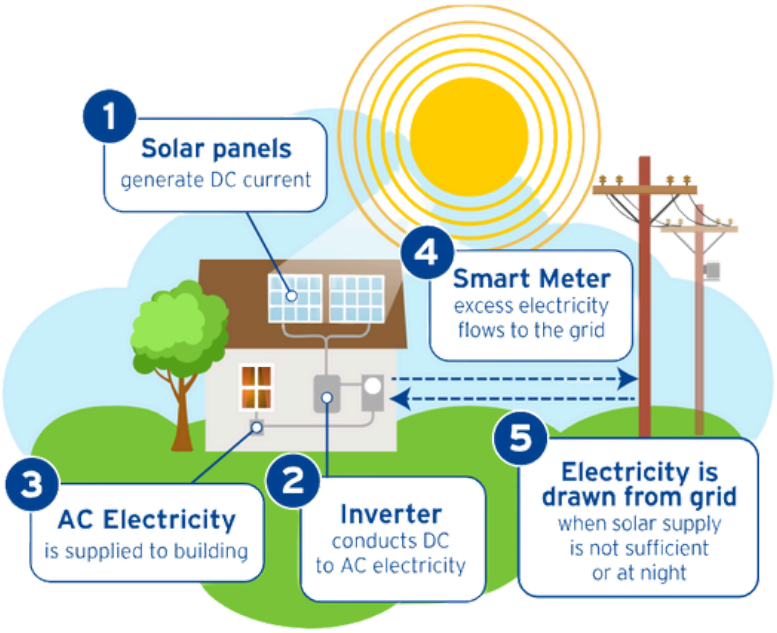
One of the most common tools is called a solar panel. Solar panels are made of materials that catch sunlight and change it into energy we can use to power things like lights, TVs, or even entire buildings.

You might see solar panels on the roof of a house, at your school, or in huge fields called solar farms. Using solar energy helps protect the Earth because it's clean and doesn't pollute the air like some other kinds of energy.

Learn More:

Solar energy harnesses sunlight to generate electricity using photovoltaic (PV) panels. When sunlight strikes these panels, it excites electrons in the semiconductor material, creating an electric current.

This process provides a renewable source of energy that can power homes, businesses, and even entire communities. Solar panels can be installed on rooftops or arranged on large-scale solar plants, reducing our use of fossil fuels and decreasing greenhouse gas emissions.



Scan to learn more about these solar steps!

Every step has at least two choices. Do ONE to complete each step. Inspired? Try them all!

CHOICE - Choose One:

☐ Build a Sun Tracker:

In this activity, you'll make a simple sun tracker to observe how the sun moves, learning how some solar panels follow the sunlight to collect more energy!

Materials: paper plate, straw, clay, and pencil

1. Mark hours on the plate's edge and place a pencil upright in the center using clay.
2. Place it outside in a sunny spot and observe how the shadow moves throughout the day.
    a. Optional: Check back every hour to see the progress of the shadows!
3. Talk about how the shadow changes as the sun moves across the sky, just like how some solar panels follow the sunlight to collect as much energy as possible!

Need a visual?

Scan above for step by step instructions!

Scan above for a YouTube tutorial!

OR

☐ Solar Panel Demo:

In this activity, you'll create a simple circuit using a small solar cell to power an LED light, just like how real solar panels power homes, schools, and more!

Materials: Small solar cells (from old garden lights or craft solar panel), LED bulb, wires, tape.

1. Carefully remove solar cell from the light if using a garden light.
2. Tape wires to the solar cell's terminals and connect to an LED.
3. Test it using sunlight or a flashlight.
4. Discuss how panel orientation and weather impact power.

Scan above for an amazon materials list

Scan above for a YouTube tutorial!

STEP
2

TECO's Solar Story

Tampa Electric (TECO) has been working for years to bring more solar energy to Florida and reduce carbon emissions. They built big solar plants with solar farms, like Dover Solar in Hillsborough and Juniper Solar in Pasco, that now generate enough solar electricity to power more than 220,000 homes with sunshine!

TECO has a total of 27 solar farms in the West Central Florida area! Scan the QR Code to find out more about them.

What's a Solar Farm?

A solar farm is a big area filled with lots of solar panels that collect sunlight and turn it into electricity. Unlike rooftop panels, these are set up on the ground in wide, open spaces where they can receive direct sunlight all day.

The energy from a solar farm goes into the power grid, which is the system that brings electricity to homes, schools, and businesses. Companies like TECO use solar farms to provide clean, renewable energy to lots of people. Using solar power from these farms helps reduce pollution and protect the environment.

CHOICE - Choose One:

☐ **TECO Solar Trail:**
One Solar Farm at a Time

In this activity, you'll explore where TECO's solar farms are located and guess where the next one could go in West Central Florida!

1. Dig deeper into TECO's solar milestones by scanning the TECO Solar Research QR code.
2. Discuss the makeup of each of these farms (location, surrounding community, rural vs. suburban, etc).
3. Based on the similarities in each of the farms, make their best predictions on the next best location in West Central Florida to support a solar farm.
4. Reflect on why this location and what businesses, communities, or schools it could energize.

Scan to read about TECO Solar Research

OR ••••••••••••••••

☐ Sunprint Tote:

In this activity, you'll use paint, leaves, and sunshine to make a one-of-a-kind fabric print.

Materials: Light colored tote, acrylic or fabric paint, paintbrush, leaves/flowers

1. Paint the front of the tote bag
   a. Use watered-down acrylic paint to cover the fabric (thick paint won't work well).
2. While the paint is still wet, gently press leaves, flowers, or other shapes onto the fabric.
3. Place your fabric in a sunny spot and let it sit for 1–2 hours, or until it's dry.
4. Carefully lift off the leaves. You'll see a cool print where the sun hit the paint, and where it didn't!

Extra: Have extra totes or materials? Try switching steps one & two to see if it turns out differently!

STEP 3

Why Does Solar Matter?

Solar energy is the most abundant and fastest-growing energy source. Solar power offers a clean alternative to fossil fuels, significantly reducing greenhouse gas emissions.

Solar energy can help save money when it's used instead of other fuels to generate electricity. Its scalability and decreasing costs make it suitable for different uses, from homes to factories.

As solar panels become more affordable and efficient, they help create stronger communities and reliable energy for generations to come.

CHOICE - Choose One:

☐ Build a Mini Solar Plant

In this activity, you'll create your own mock solar farm using craft supplies. You'll make solar panels, place them in a "field," and add the sun and sky to show how solar energy works. Let's build it together and see how sunlight powers our world!

Materials: Shoe box, foil, construction paper, yarn, glue, scissors, string, markers, tape, magazine cutouts of farm animals (optional)

1. Make Your Solar Panels: Cut out small rectangles from cardstock or construction paper. Cover one side of each panel with foil to look like shiny solar panels.
2. Build Your Field: Stand the shoe box up like a diorama (lay it on its side with the opening facing you). Attach your solar panels to the inside "ground" of the box so they look like rows of panels in a field.
3. Add the Sky: Use blue paper or markers to create the sky on the back wall. Draw or cut out a sun and clouds and tape them to string. Hang the string across the top so they can dangle above your solar field.
4. Decorate Your Farm: Add farm animals or decorate the ground with grass and flowers. Be creative! Label the parts of your solar farm with words like "Sun," "Solar Panel" and "Electricity."

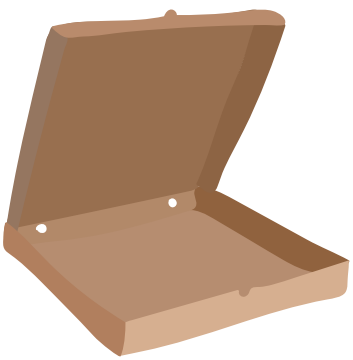
Seeking a Challenge? Try this 3-D Solar Powered House Model

Solar Oven: Make S'mores® with Sunshine

In this activity, you'll build a simple solar oven out of a pizza box, and learn how solar energy can be used to heat things up—just like a real oven! Then, you'll use your solar oven to melt gooey S'mores®.

Materials: Cardboard pizza box, aluminum foil, small aluminum pie dish, plastic wrap, black paper, tape, glue, scissors, pencil (or wooden skewer), S'mores® ingredients (graham cracker, marshmallows, chocolate), glass bowl, oven mitts, digital meat thermometer (optional)

1. Cover the inside of the pizza box with foil (shiny side out) and tape it flat.
2. Glue or tape black paper to the inside bottom of the box to absorb heat.
3. Place a small aluminum pie dish on black paper and assemble the S'more® (place the chocolate and a marshmallow on one half of the graham cracker) inside the box.
4. Place a glass bowl over the S'more to serve as an insulator. Prop the top pizza flap open with a pencil to reflect sunlight. Place the box facing the sun for 30–60 minutes. Optional: make a chart and check the temperature inside the glass bowl every 10 min and compare to the outside temperature using a digital meat thermometer.
5. When the chocolate and marshmallow are melted, add the top cracker!



Scan above for a YouTube tutorial!

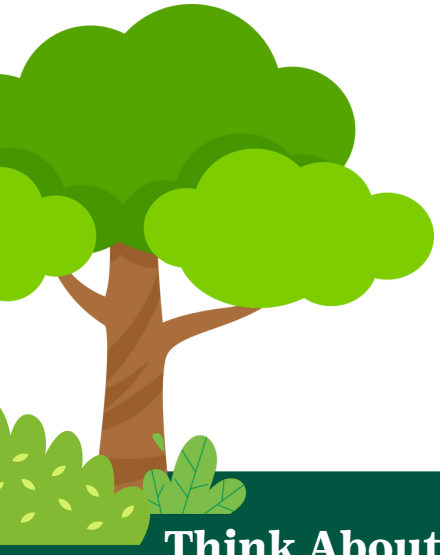
STEP
4

Solar Power's Impact on our World

Solar panels can be found in all kinds of places, from rooftops in cities to large solar farms in the countryside. They can change how land is used and can bring new opportunities to communities. For example, solar farms can create jobs for local workers and boost the economy in smaller towns. Some schools and cities use solar energy to lower their electric bills and put that money toward other things, like books or parks.

Draw Here:

Draw someone working at a solar farm, installing panels on a roof, or helping others learn about solar power. You could even draw a school, library, or park that's powered by the sun!



Think About: *What kind of job in the solar energy industry would you like to explore?*

Learn more:

Unfortunately, solar power isn't perfect... yet!

Solar panels can only make power when the sun is up, so we need special batteries for nighttime and cloudy days, and those can cost a lot. Solar farms also need a lot of space, and building panels use materials that must be recycled carefully.

The good news is that new technology is making solar panels better, smaller, and easier to recycle, so solar power keeps getting cleaner and stronger!

CHOICE - Choose One:

☐ **Design your Solar-Powered World**

In this activity, you'll draw your own solar-powered community: one with clean air, green parks, and smart solar energy solutions. Use your imagination to design a brighter, cleaner future!

Materials: Markers, crayons, drawing paper or poster board

1. Think about what a solar-powered neighborhood might look like. What kind of buildings would use solar energy? What would the environment look like with cleaner air and more green space?
2. On your paper, create a picture of your ideal solar community. Include houses with solar panels, parks with clean air, and anything else you'd like to power with the sun, maybe even a solar-powered ice cream truck!
3. Label the items in your drawing to show how they use solar energy.
4. Talk about your drawing with your group. What solar ideas did you include? How could we make them real in our communities?

Did you know?

There are many cool careers in solar energy! People work as builders, engineers, teachers, and even helpers who talk to families about solar panels. Some design the panels, others install them or make sure they work the right way. As more people use solar power, we'll need more workers to help bring clean energy to homes, schools, and cities.

Scan above to explore careers at TECO!

Community Impact Map: Where Solar Makes a Difference

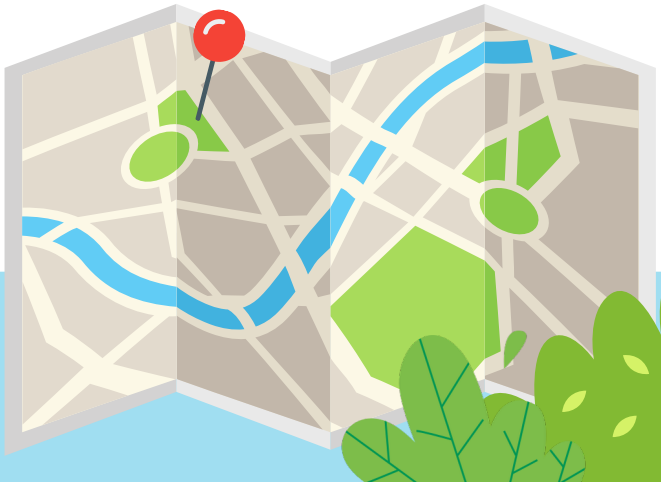
In this activity, you'll create a map showing real places in your community that use solar power and learn how it's helping people every day.

Materials: Map of your local area (real or drawn!), markers, pens, stickers or sticky notes, ruler, yarn, tape

1. Using the QR code below, look up schools, businesses, or public buildings in your area that use solar panels. Use stickers or symbols to mark them on your map.
2. Next to each location, write how solar energy helps that place (for example saving money, protecting the environment, or helping students learn).
3. Use lines, arrows, or string to show how solar energy is spreading in your community. Are some areas more solar-powered than others?
4. See how much sunlight your own home gets using the Project Sunroof link. How much usable sunlight does your home get? Would this kind of energy make a difference in your community?

Scan here to explore solar in your community!

Scan map of renewable energy sites near you



STEP
5

Take Action!

Being a Girl Scout isn't just about learning—it's about making a difference!

CHOICE - Choose One

☐ Host a "Solar Awareness Day" at School or a Troop Meeting

In this activity, you'll plan a simple Solar Awareness Day by sharing fun facts, giving a short talk, or creating posters to teach others about solar power.

1. Make posters or give a short talk about how solar power helps the Tampa Bay region. Share at your next school project or Girl Scout troop meeting!
2. Share facts from TECO's Solar 101 resources or show where TECO's solar plants are.
3. Bonus: Invite a guest speaker or play a short video about solar energy.

OR • • • • • • • • • • • • • • • •

☐ Solar for the Future: Pledges & Posters

In this activity, you'll use your creativity to show how solar power can protect the Earth and power our communities. Whether you're making a personal pledge or designing a vision for a solar-powered Tampa Bay, your voice can inspire change!

1. On a piece of paper, write or draw your "Solar Hero Pledge." Start with "I promise to help the Earth by..." and decorate it with sun, panels, or planet Earth drawings OR create a colorful poster that shows your vision. Include TECO's solar efforts like the Juniper Solar Plant and Big Bend Solar as part of your scene.
2. Add a slogan or a short message about why solar energy matters. Display your pledge or poster to help others imagine a cleaner, brighter future. Tag #gswcf & Tampa_Electric (Instagram) or Tampa Electric (Facebook) to share your advocacy efforts!

Thanks for participating in the TECO Solar Powered Patch Program!

Scan here to fill out your patch request

To complete request, you will need: the number of patches requested and photos of your troops' TECO activities.

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Glossary:

Absorption
When a surface takes in sunlight and turns it into heat or energy. Darker surfaces absorb more sunlight.

Alternative Energy
Clean energy that replaces fossil fuels—like solar, wind, or water power.

Carbon Emissions
Carbon dioxide and other gases released when fossil fuels are burned. These gases pollute the air and trap heat in the atmosphere.

Electric Current
A steady flow of electricity that moves through wires to power things like lights and appliances.

Electricity
The power we use to turn on lights, TVs, computers, and more. Solar panels can create electricity using sunlight.

Energy Independence
When a home or country makes its own clean energy and doesn't need to rely on buying oil or gas from somewhere else.

Fossil Fuels
Energy sources like coal, oil, and gas that come from deep in the Earth. Burning them pollutes the air and adds carbon to the atmosphere.

Inverter
A machine that changes the electricity made by solar panels into the kind that homes, schools, and buildings can use.

Photovoltaic (PV) Panel
A special panel that turns sunlight into electricity. These are the panels you see on rooftops or in solar plants.

Power Grid
The big network of wires and stations that carries electricity from power plants to homes and businesses.

Renewable Energy
Energy that comes from sources that won't run out—like the sun, wind, or water.

Scalability
How easily something, like a solar energy system, can grow bigger or be used in more places to help more people.

Semiconductor
A special material inside solar panels that helps turn sunlight into electricity by moving electrons.

Solar Energy
Energy that comes from the sun's light and heat.

Solar Engineer
A person who designs systems that collect and use solar energy.

Solar Impact
The good things that happen when we use solar energy—like cleaner air, lower electricity bills, and less pollution.

Solar Panel
A flat surface that collects sunlight and changes it into electricity.

Solar Plant/ Solar Farm
A large area with lots of solar panels that work together to make electricity for many homes and businesses.

Solar Technician
A person who installs and repairs solar panels.

Notes: