



# SERT

School Energy and Recycling Team



## Welcome to the SERT Elementary Energy Chain Assembly Activity Pack

“It’s your world...choose to conserve”

If you have any questions or concerns please contact the  
SERT Office @ 240-314-1090  
or e-mail [Sert@mcpsmd.org](mailto:Sert@mcpsmd.org)



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## Adult Sponsor Guide

SERT Team leader – Things to think about prior to your assembly.

SERT would like to share this activity to engage students in a hands-on demonstration to show how energy moves from the sun to your house/school site.

This activity can be used for students from K to grade 5.  
Adjustments can be made in the classroom for content.

Time: Depending on class size and grade level, this activity will take 20 to 45 minutes

Materials: \*\*Copies of attached pictures to use as props for the volunteers to hold up during the actual assembly of the energy chain.

Options: You may invite your SERT facilitator to lead the energy chain assembly (with props).

Be enthusiastic and make this activity fun!

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## What is Energy?

We use energy every day.

Q. Can anyone here think of how they use energy?

A. Running and playing- we get our energy from the food we eat in form of calories

Q. Does anyone know where energy comes from?

A. The sun is the source of almost all the energy on Earth

Energy helps us to do things; it gives us light, warms our bodies & homes, bakes cakes and keeps ice cream frozen. Simply put, it is the ability to do work.

Questions:

- Can anyone think of how they use energy?
- Does anyone know where energy comes from?

The energy that powers our lights or heats our homes may come from coal, natural gas, nuclear energy, water, wind, or the sun. Over use of energy harms the environment because the production and use of energy is the largest cause of air pollution. It is the source of most of the emissions that cause global warming.

## Where does energy come from?

Ask for 10 volunteers to act as one of the links that are listed below. You can print out the attachments as visual props.

\*\*The links in the energy chain are:

### Sun

Sun: The sun gives out more energy in one second than all the people in the world could use in one million years.

Plant Matter: Millions of years ago the earth was covered by huge swamps with ferns and algae. When the plant matter died

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it was buried and the pressure of the sediment and water with the heat packed it down and turned it into peat and then...

## **Coal**

Coal: This was formed millions of years ago. It is a shiny black rock that when burned makes heat and light energy—It is a non-renewable resource.

## **Coal Miner**

Coal Miner: Since a lot of coal is deep in the ground miners must dig for coal. Some mine shafts are 1000 feet deep.

## **Coal Cart**

Coal Cart: Once the coal is extracted we must move it.

## **Coal Train**

Trains: We use transportation to move the coal around the country. 33% of the CO<sub>2</sub> emissions in the US come from transportation.

## **Power Plants**

Power Plants: Power Plants use huge magnets to make or generate electricity. A big coil of copper wire spins inside the magnets. As it spins the magnetic fields push and pull electrons in the wire.

## **Transmission Lines**

Transmissions Lines: The spinning turbines make electricity and it flows into transmissions lines. They flow through the transmissions lines and then to our homes and schools. In one second electricity moves through the wires very fast, it can travel around the world seven (7) times in one second.

## **Switch Master**

The Switch Master: The switch master is the person who flips the switch from off to on.

## **Light Switch**

The Light Switch: A switch is a mechanical device used to connect and disconnect a circuit at will. Basically we consider it a gate that can be open or closed.

## **Light Bulb**

When we turn on a light switch the electricity flows through a tiny wire and when it gets hot the gas in the bulb glows.

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**Incandescent Light Bulb:** An electrical current passes through a thin filament, heating it until it produces light. These bulbs are gradually being replaced by compact fluorescent lights (CFL). CFL produce the same amount of visible light but use less electrical energy.

**Compact Fluorescent Lights:** CFL Energy Star qualified bulbs use about 75% less energy, produce about 75% less heat than standard incandescent bulbs and last up to 10 times longer. So, they are safer to operate and can cut energy costs associated with use.

## Why We Want To Save Energy? (3<sup>rd</sup>-5<sup>th</sup> grade option)

Discuss benefits of conservation and the relationship to CO<sub>2</sub> emissions (blanket). Heat from the sun gets trapped under the blanket. CO<sub>2</sub> contributes to Global Warming, but is necessary to sustain life. Everything is part of the carbon cycle—Too much carbon isn't a good thing- because long wave energy can't get through the greenhouse gasses. Without the greenhouse effect the Earth would be uninhabitable; in its absence, the mean temperature of the earth would be about -19°C (-2°F, 254 K) rather than the present mean temperature of about 15°C (59°F, 288 K).

Renewable Resources (Sun)

Non Renewable (Fossil Fuels)

Sun – Coal – Light

Sun – Solar – Light

## How can you save energy?

Ask for suggestions on how to save energy?

At home:

Turning off lights

Turning off TV when you leave the room

Turning off Computer when you stop using it

Walk or ride a bike to park or sports practice (if it is close)

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Car pool

Play outside or read a book instead of video games

Play a board game or do puzzles

At school:

Computer labs—end of day shutdown

Line leaders, Caboose, Energy Captain, Computer Captain, Patrol teams

Ask your teacher “Can I shut down these computers for you?”

“Can I turn out the lights when we leave the classroom?”

“Can I help at the end of the day by volunteering to shut down the computers in the lab?”

“Can I turn off the overhead projector for you?”

Remind everyone how much energy they use each day, and try to save their energy use a little more each day. Remind family members about saving.

Ask for suggestions on how to save energy in the classroom?

## Review

What is energy?

Where does energy come from?

For people?

For the earth?

List a few things that we use energy for?

What are the steps in the energy chain?

How can we save energy?

At home?

At school?

Remember:

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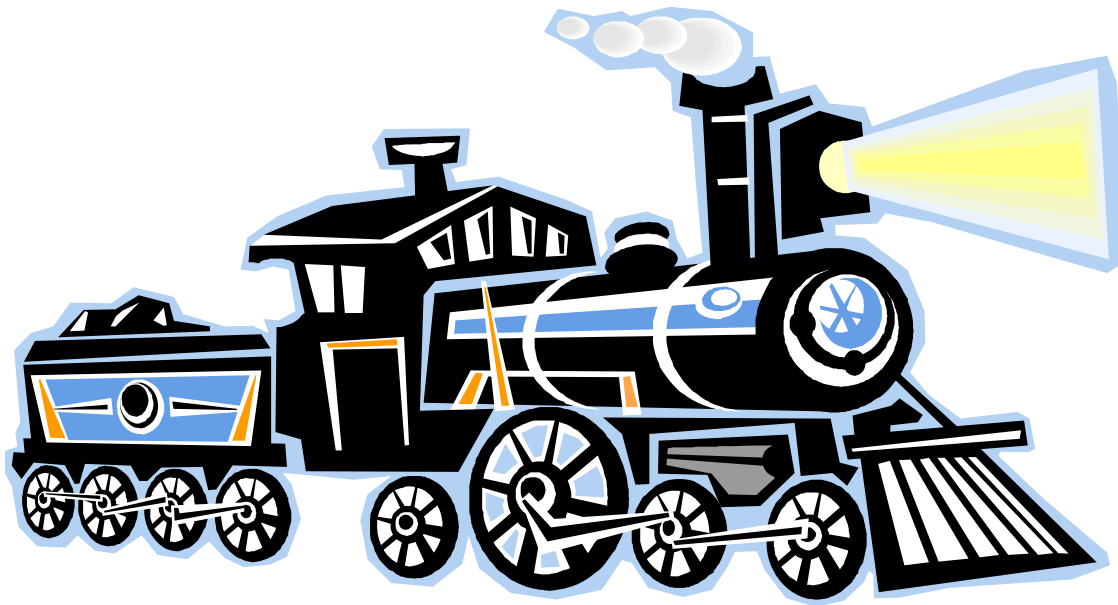
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