1st - 2nd GRADES UNIT 2:

BRINGING HOPE TO SOCIETY

through

ENERGY, LIGHT, CIRCUITS, AND LOVE

In this unit, the first and second grade students learned that energy comes in many forms. There was an overall theme of energy in this unit. How do we use energy to Bring Hope to Society? How do we use our own personal energy to bring hope to society? And, how do we aspire to connect to G-d and through this connection bring hope to society? They can explain that energy is the ability to do work. It powers every machine and person and that it is necessary for every activity. This unit made students aware of the many different sources of energy and they also learned how to conserve energy.

We started this unit by asking our students; "*What is energy and how does energy make things work?*" Our students are able to describe what energy is and have created numerous charts and posters describing their knowledge. They continue to use these charts as a classroom resource, which aids them in their learning and vocabulary development.

ENERGY SOURCES

The students worked in pairs to create energy sources posters. They describe the numerous sources of energy that they have learned about.

KINETIC & POTENTIAL ENERGY

The first and second graders can describe potential energy and kinetic energy. They know that kinetic energy is energy in motion. It is the opposite of stored, or potential, energy. Kinetic energy can be transferred between objects or changed into potential energy. Throughout this unit, we have done several simple experiments that have shown our children the effects of kinetic energy and how it is transferred between objects. In art class, they have created catapults, which demonstrate potential and kinetic energy.

GRAVITY RAMPS

The boys and girls understand gravity. They know that everything that goes up, must come down. To that end, we have conducted numerous gravity experiments and even sang a gravity song. When asked to predict which would fall to the ground first, a crumpled piece of paper or a heavy book, the children made and listed their predictions on chart paper. After we conducted the experiment, they discovered something amazing! They can explain if any two items were dropped at the same time, and at the same height, both items would fall to the ground at the same time due to the force of gravity! The boys and girls also worked in teams to design and build a ramp using any items they could find in our classroom. Each uniquely crafted ramp demonstrated the concepts of gravity, push, pull, force, and speed. The boys and girls had so much fun measuring how far their toy cars traveled.

CLASS BOOK

The children can explain the sources from which energy is obtained. (e.g., sun, water, wind, fire, food, gasoline, electricity, batteries). They can describe where energy comes from and how we use energy. The students are able to describe ways that humans have harnessed or converted natural energy sources: hydroelectric dams, coal/oil power plants, nuclear power plants, wind turbines, solar panels, etc. They can explain that we need energy to: heat houses and other buildings, to illuminate light, to power televisions, radios, games, cars, to run computers and appliances. The boys and girls described their favorite source of energy in a class book.

WIND ENERGY WHIRLIGIGS

Our students can describe wind as "moving air" and describe the characteristics of wind. They can compare and identify different wind intensities. The children investigated and illustrated wind as a form of energy. They compared wind machines and recognized they all use the wind to do work. They can describe that wind energy is even used to grind grain. The boys and girls concluded, through observations, that wind is a clean, renewable energy. Students made and decorated a whirligig to demonstrate that wind can move items.

MAGIC LIGHTBOX

They can describe light energy that comes from the sun. They can explain that the Sun is the natural source of heat and light on the Earth. Our students can explain that the sun is a medium sized star, which gives us light and heat. They are able to explain that we see the sun because it is much closer to Earth than other medium sized stars. The children also learned ways they can protect themselves from the sun and sunburns. The boys and girls conducted a light box experiment. They were asked to peep into a hole and describe the items inside of the box. All of the students quickly discovered that we need to light in order to see. The boys and girls can describe where other light sources come from. Such as; fire, lightning, flashlights, and lanterns.

SOUND AS ENERGY

The students can describe energy that comes from sound. They have conducted numerous sound energy experiments, including making a telephone using cups and a string, a guitar made from a tissue box and rubber bands, and simply placed their hands over their voice box while humming at different levels. Based on these experiments, the children quickly learned what all sounds have in common. -Something is moving or vibrating before or during a sound. They can describe that all sounds have small back-and-forth movements. When students plucked a rubber band stretched over the opening of a tissue box guitar, they observed the vibrations of the rubber band and how they related to the sound made.

ART INTEGRATION

Getting creative and putting their minds to work the first and second graders created a moving catapult. This incorporates what they have learnt about gravity, potential and kinetic energy. They stumbled upon various issues on the way but they problem solved and came up with solutions to make it work in different ways and then had fun using their catapults comparing how far their subjects went, each one having different potentials.

STUDENTS ARE LEARNING

NYS.SCI.PS.4 b,c,d: Identify a force as push or pull. Observe and describe how heat is conducted and can be transferred from one place to another.

NYS.SCI.PS.5.1a Observe and describe the position of an object relative to another object (over, under, on top of, next to).

NYS.SCI.PS.5.1b, c: Demonstrate how the position or direction of an object can be changed by pushing or pulling (forces and motion):Change the direction of objects by pushing and pulling using blocks, ramps, cars, and balls. Inclined plane

NYS.SCI.PS.5.1c: Identify gravity as a force that pulls objects down: The balance scale. Balance and the center of gravity

NYS.SCI.PS.5.2a: Observe and describe how the force of gravity can affect objects through air, liquids, and solids.

CC.SCI.PS.4.1a: Observe, identify, and describe a variety of forms of energy: Sound, Heat, Chemical, and Mechanical.

CC.SCI.PS.4.2a, b: Identify the evidence for energy transformations and how humans use these energy transformations: Heat to light, chemical to electrical, electrical to sound, etc.

CC.SCI.PS.4.1b, c, d: Observe and describe how heat is conducted and can be transferred from one place to another.

CC.ELA.W.7: Conduct short research projects that build knowledge about a topic.

CC.ELA.2.7W With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

CC.TECH.D.8: Designs a solution or product, taking into account needs and solution or product, taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety, aesthetics).

NYS.NA-VA.K-4.1: Understanding and Applying Media, Techniques, and Processes.