

ST. AGNES CATHOLIC SCHOOL

Project Title: Energy in our School

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The students in 4th grade at St. Agnes have worked hard to accomplish our goals. We have learned about energy and where it comes from and we created information boards. We visited grades 1-5 and taught them about the forms and sources of energy. We displayed our Information Boards throughout the hallways in school. We learned about energy use within our building and using the NEED energy measuring devices such as light meters and thermometers to take a survey of the way we use energy here at St. Agnes. We invited a guest speaker who is a professional in the energy field to speak with us about Ky. energy usage and the gas industry. We invited our Facilities Manager to speak with us about the school energy system. We took our data and what we learned to create a powerpoint presentation to educate teachers and staff about ways to reduce our carbon footprint within our school building. Lastly, we have a building on our campus that will either be renovated or replaced. We created a presentation for a Green Energy Building and presented it to the Parish Community, our Priest, Father David, our Principal, Julie Daly, parents, the Pre-School/After School Care Director, Karen Kaseta and the Architects who are designing the building.

Goal #1

Our first goal is to learn and teach others about the forms and sources of energy.

Activity and tasks:

- Investigated the forms and sources of energy.
- Learned where energy comes from.
- Worked in small groups to design info. boards and presentations to teach other grades (1-5) about the energy forms and sources.
- Wrote reflections about what we learned after the presentations.
- We prepared a presentation to share with parents, students, and the community in our Energy Info. Booth during our Science Fair to be held on Friday, April 27.

Energy content and resources:

- NEED investigation supplies
- NEED.org
- Wikipedia
- Energy Info Book

Goal #1 Continued

Student Leadership:

Student energy team members completed research, pictures, video recordings and created a poster. Members also went to classrooms to teach about forms and sources of energy and wrote reflections. Energy Team members displayed posters in the hallway for parents, visitors, students and teachers to view. Energy team members researched and planned an Energy Information Booth to display during our Science Fair for students, parents and the community at St. Agnes on April 27, 2018

Citric Power vs. potato power

Problem Statement:

Does citric power or potato power produce more energy?

Hypothesis:

If I connect three lemons and a light bulb together, and connect 3 potatoes and a light bulb together, then I think the blbs will both light bulb.

Materials:

- 3 lemons
- 3 potatoes
- 6 zinc nails
- 6 pennies from before 1988
- 8 alligator clips
- 2 LED light bulbs
- 1 note book or piece of paper
- 1 knife

Procedure:

1. Slice all of the potatoes and lemons in half
2. Stick one zinc nail into each lemon and potato.
3. Stick one penny into each lemon and potato
4. Using the alligator clips, connect all the all the potatoes going from nail on potato A, to penny on potato B. Make sure to leave two potatoes disconnected.
5. Repeat the step on the lemons.

Pizza Box Solar Oven

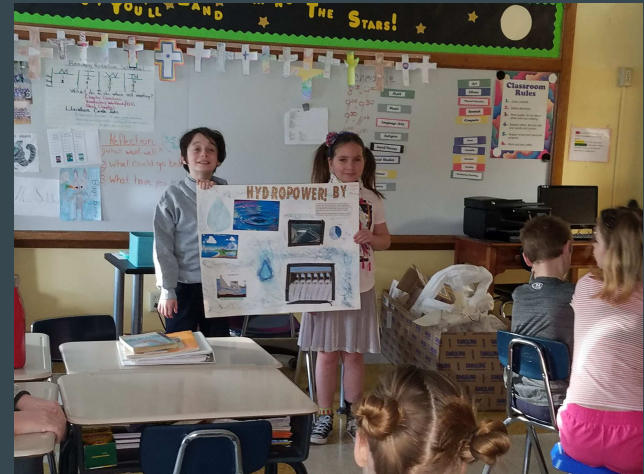
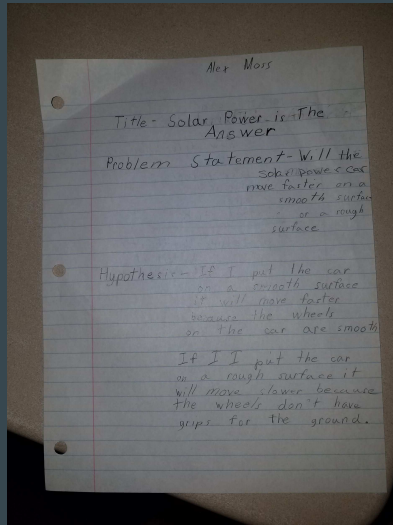
Problem Statement

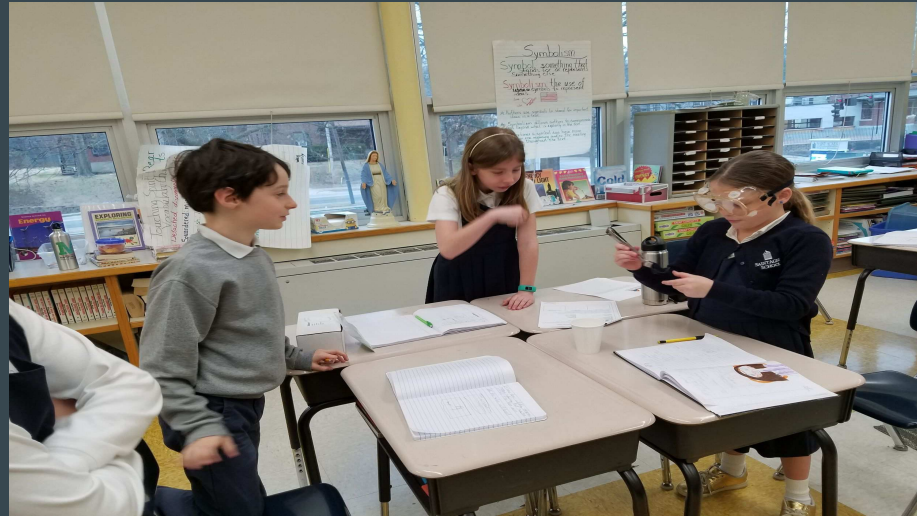
Is a solar oven also supposed to be inside just like they are supposed to be inside. (needs to be checked)

Hypothesis

Question: Which cookie cooks faster in a solar oven?

Hypothesis: If I cook a sugar cookie and choc. chip cookie in a solar oven then the sugar cookie will cook faster because the choc. chip will make the cookie's gross and take longer to completely cook.





Goal # 2

To reduce the Carbon Footprint at St. Agnes Catholic School.

- We met three times a week before, after, and during the school day, to survey the building.
- We investigated which classrooms and offices left lights off or on, if doors were closed, blinds were open or closed, took the temperature of the classrooms and offices, measured the light output in rooms, checked computers, monitors, and projectors.
- We analyzed the data to make recommendations to the teachers and staff.
- We created a powerpoint presentation.
- We presented our powerpoint to the teachers and staff of Saint Agnes School.
- We had a guest speaker, Casey Kaufman with Constellation Energy, who is a professional in the gas industry visit and teach us about where pockets of gas are, how it is moved, used and new and improved methods of storing gas.
- We had the facilities manager for our campus, Tom DeSpain, visit and talk to us about the site, facilities, and energy consumption on our campus.

Goal #2 Continued

Resources

NEED.org

Facilities Manager - Tom DeSpain

Constellation Energy - Casey Kaufman

Energy Survey from NEED Blueprint for Energy Teams

Leadership

Students on the energy team gathered information from various sources (speakers, research, NEED energy resources) and created a presentation on how St. Agnes teachers and students can reduce our carbon footprint in our school. Energy team members collected data, analyzed data, and created a powerpoint presentation and presented to 35 teachers and staff.

Since the presentation teachers have reported that they are adopting energy saving principles into their routines. They are turning lights off when they leave their rooms, ensuring monitors, projectors and computers are off, they have reported using less artificial lighting and more natural light and our Administration makes announcements to remind faculty and students to turn off lights and close doors when not in the room.

God calls us to be good stewards of our environment, we can do this by...

- Making sure your projectors are off
- Keeping your blinds open to allow natural light and heat in the room
- To not waste a lot of energy
- Keeping your doors closed so the heat stays in the room
- Try to turn off the lights whenever you leave the room
- Try to make sure computer monitor is off
- Only using heat when you need it
- Turning most electrical devices off at the end of the day



Mr. Kaufman

Notes on Energy/Natural Gas

- heating is from natural gas
- it's 6,000 feet under ground
- most gas in from Mexico
- gas flows through pipelines
- natural gas is used to power power plants
- it's non-renewable
- they found 500 trillion cubes of gas
- it is cleaner than most resources
- a pipeline can explode if there is too much pressure
- natural gas is better than just gas
- trucks use Com Gas stations/natural gas gas stations
- you use very little gas in your house in one month
- gas gets transferred into heat by a pilot wick makes a big flame and it just gets bigger
- they only discard sour gas/bad gas and don't use it
- people use drills because it is too dangerous to go under ground or human
- all states have had at least one pipe
- alot of gas comes from the floor of the ocean



Heating/Cooling Systems

1. What kind of heating system is used in the school? What fuel does it use? *Gas & electric*
2. How old is the heating system? *1997*
3. Does the heating system have a programmable thermostat to control temperature? What are the settings?
4. What kind of cooling system is used in the school? What fuel does it use? *-the CHILLER*
85 & 33
5. How old is the cooling system?
6. Does the cooling system have a programmable thermostat to control temperature? What are the settings?
7. Is there an air exchange system to provide fresh air when the heating and cooling systems are not operating? *- we've got several some have their own.*
8. Are the boilers, pipes, and ducts sealed and insulated? *Yes!*
9. Are the heating and cooling systems maintained on a regular basis? *Yes!*
10. Does your school make use of passive solar heating? *No, not really.*

Water Heating

1. What fuel is used to heat water in the school? *Gas - water heaters and the boilers.*
2. Is there more than one water heater? How many? *yes, 2.*
3. How old are they? *5-10*
4. Do the water heaters have timers?
5. At what temperatures are the water heaters set? *Kirkman School 140°F - 120°F*
6. Are the water heaters and water pipes insulated? *yes.*
7. Are there leaks in the hot water system?
8. Are flow restrictions used? *Yes - only in the dishroom*

Lighting

1. What kind of lighting is used in the school? Outside the school? Exit lights? *various kinds - most LED*
2. Can the lights be controlled with dimmer switches? In which areas or rooms? *Some can*
3. Does the school make use of skylights and natural lighting? *No, yes*
4. Are there timers for the outside lights so they go off automatically? *No - and - Yes*
5. Are there automatic timers for any of the indoor lights? *Yes!*



School Building Survey

Mr. Desjian Talk

The gym uses the most energy in the int com

General Information

1. When was the school built? *1948, 1964 - 1969 - 2005 - and we are still not finished!*
2. What changes have been made since the school was built? When were they made?
3. What things use energy on the school grounds? Lighted fields? Outdoor lighting? *- yes \$150 a month*
4. What fuels are used in the school? For heating, cooling, water heating, lighting, other? *- electric & gas*
5. How much does the school pay each year for energy? How much for electricity? How much for heat? *- Are there other energy costs that the school pays for like buses? It is tough to say 10,000 a month 70,000 a year*
6. How many hours is the school in use each week? *- 44-48 hrs a day*
8. Do other groups that use the school pay for the energy they use? *- No.*
9. Who is in charge of controlling energy use in the school?
10. Who is in charge of maintaining energy-use equipment? Is there a maintenance schedule for all energy-using systems? *- No, because we don't have energy saving syst*

Building Envelope

1. What is the building made of? Is it in good condition? *Brick & Block, and concrete & steel.*
2. In which direction does the building face? *EAST.*
3. How many windows are on each side of the building? Are any windows cracked or broken? *DOUBLE*
4. Are the windows single or double-paned? Can they be opened? Do the windows have adjustable blinds?
5. How many outside doors are there? Are they insulated? Are there windows in the doors? Are any cracked or broken? *13 - counting the scout room most yes!*
6. Does the building have insulation in the walls and ceiling? *Are inside stairwells open or enclosed?*
7. Do windows and doors seal tightly, or do they leak air?
8. Are trees placed around the building to provide shade in warm months?
10. Are there awnings or overhangs over the windows to shade windows from the overhead direct sun in warm weather, yet allow the slanted rays in winter to enter?

He didn't answer

Goal #3

Our third goal is to make recommendations to the Buildings and Grounds committee, Parish, and Administration to consider in their choice to renovate/ or replace an existing building on campus using Green Energy alternatives.

Activities and Tasks

- We analyzed our data from our building survey to determine our problem areas.
- We researched the problem areas in our building for green energy alternatives.
- We investigated alternative energy sources.
- We researched other Green School Buildings and designs.
- We created a powerpoint presentation.
- We shared our presentation with the architects, Pastoral Council members, Finance Council, Congregate for Something Great committee, school administration, parents, Parish Priest (Father David), building and grounds committee members, and teachers.

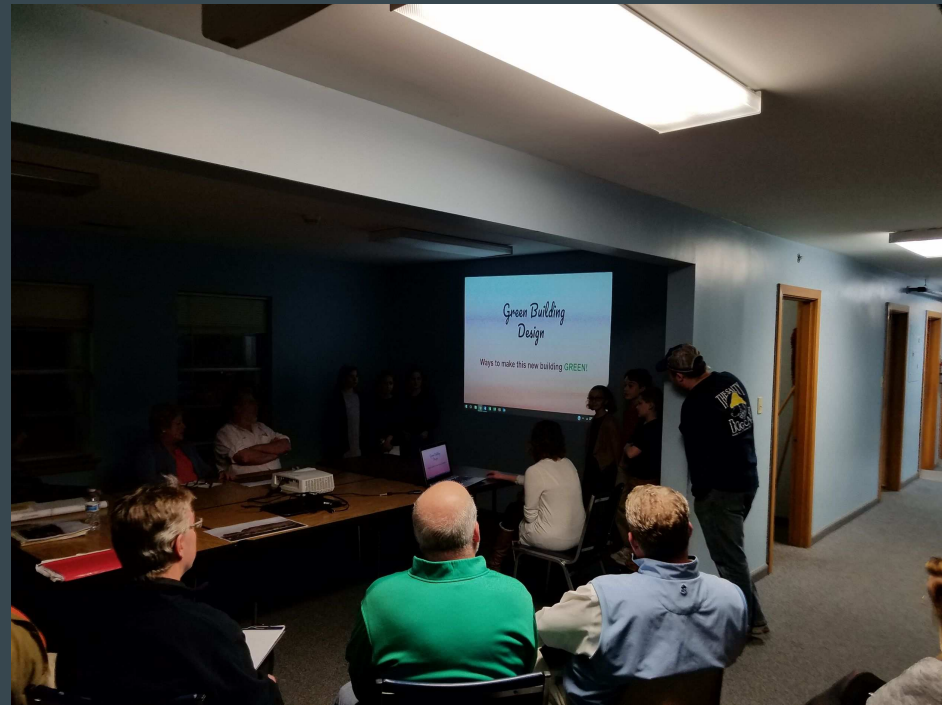
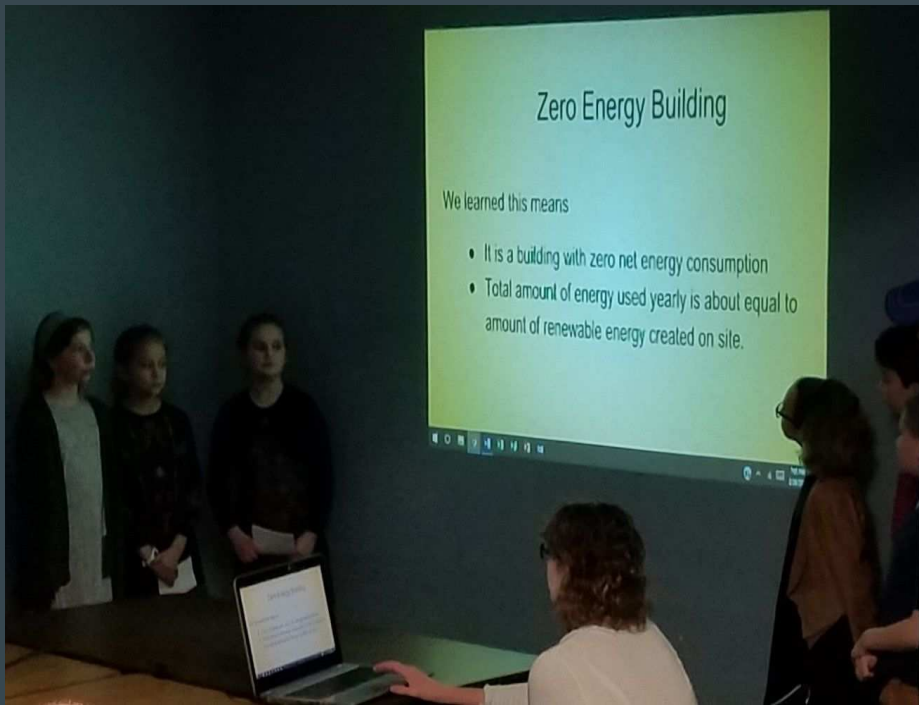
Goal #3 Continued

Energy Content and Resources

- NEED.org
- Information from past goals
- Wikipedia
- NEED Info. Books

Student Leadership

Each member of the Energy Team became an expert on their topic by doing research and using data gathered throughout our other team goals. Each person created slides and then presented to the Architects, parish members, buildings and grounds committee, our Principal, parents and the Director of the Pre-School/After School Care Program. There were approximately 20 people in attendance at the meeting.

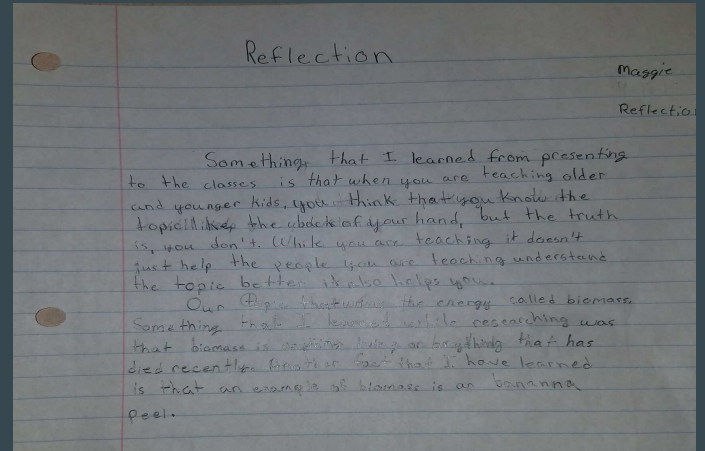


Video clip of presentation: https://youtu.be/_eC-IgEUWxE

Evaluation

For our evaluation...

- We took a pre and post energy assessment.
- We increased student learning, knowledge and awareness of energy and energy saving behaviors.
- We increased faculty and staff awareness of energy consumption at Saint Agnes.
- We researched, planned and delivered a presentation to the St. Agnes community to encourage using energy saving measures in our renovated or rebuilt building.
- We prepared an Energy Information Booth at our Science Fair for students, teachers, and parents.
- We learned how energy is used in our World, in our Country, in our State and in our Community.
- We discovered how to use tools to measure energy use in our building.



Accomplished Goals

- We learned about the forms and sources of energy and how energy is used in our world, the United States, in Kentucky, and in our community.
- We took a pre and post energy assessment. Our whole class improved their scores after our study of energy.
- We increased student learning, knowledge and energy awareness for 220 students by giving presentations in grades 1-5 classrooms. We reached St. Agnes teachers, staff and classmates, making morning announcements and hallway posters.
- We learned about energy use in St. Agnes buildings from our Site and Facilities Manager. We surveyed classrooms for energy saving actions. We used tools to measure light use, temperatures, and recommended ways to save energy in our building.
- We researched, planned and delivered a presentation to the St. Agnes Community, including parishioners, parents, and construction professionals to encourage the use of Green Energy Strategies in renovating or replacing an existing campus building.
- We have prepared an Energy Information Booth to share our energy knowledge with students, parents, and guests at the upcoming St. Agnes Science Fair.