

# Renewton

## Mount Alvernia Academy

Maria Lyons - Science Teacher

Grade 4 and Grade 5 students conducted the NEED investigations on The Science of Energy and Sources of Energy. This included Renewable Energy vs Non-Renewable Energy, Solar Panels, Wind Turbines and the Energy House.

After constructing and testing their Energy Houses, they decided to paint, decorate and add electric lighting to each house. They then decided to combined their houses into a village and added 'solar panels and wind turbines.' The students presented their village, explaining how the houses were made and about the different sources of energy in the village to younger students in the school and on the school's social media. This was a fun and exciting project.



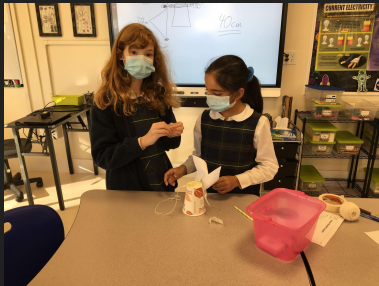


# Grade 4 and 5 Investigates Energy Sources Goals of Project



Goals: The goals of the Renewtown Project were to

- incorporate all that was learned about energy, both concepts and skills, into a final project highlighting the knowledge gained from the NEED Energy Curriculum
- apply what was learned to a real life situation, solving energy problems in a village and create the village
- share their creation and their knowledge of energy with the younger students in the school and on the school social media



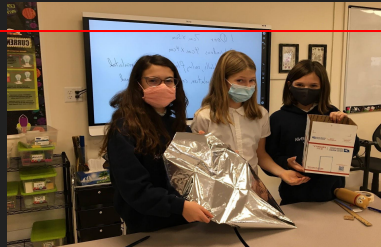
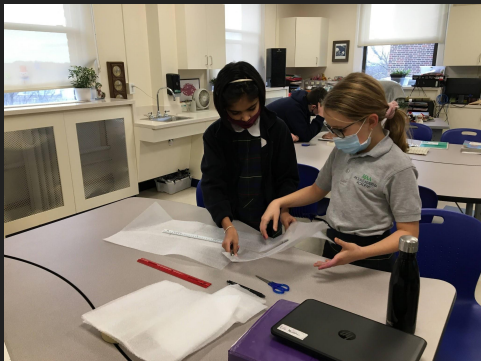
# Grade 5

## Investigates Thermal Energy and Energy Efficiency Step 1 - Choose insulation



The white padded paper worked the best for keeping the ice cool because it trapped air inside due to its many layers. Orla R.

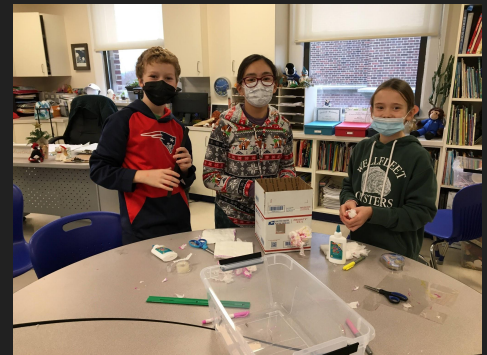
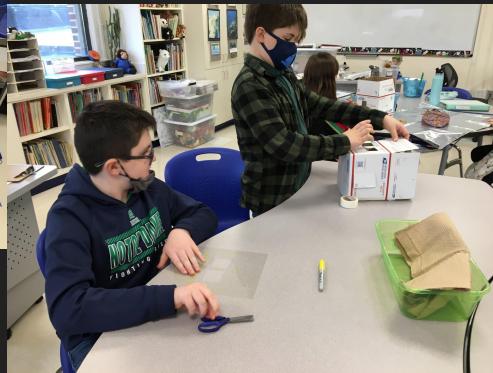
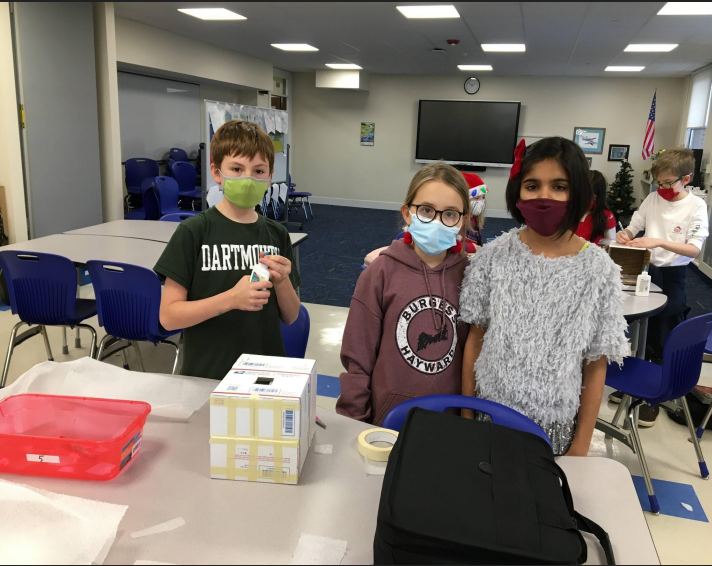
I really liked the insulation and the painting because it felt like you were a real construction worker working on a house and had to face some obstacles. We started to paint and it was more fun than I thought it would be and it turned out amazing at the end and it was fun.-Cameron P





# Construct Houses and Insulate Them

To make our houses we first got a cardboard box and found our material. Then, we measured out the door and windows. Next we put in clear film for the windows. After that, we cut our insulation to cover the walls, ceiling, and floor of our house making sure the windows were visible and so you could “walk” in the door. Next, we got cardboard paper to cover the insulation so you wouldn’t see it. Then we closed up the box and got our painting things ready and painted our houses. -Amelie M.

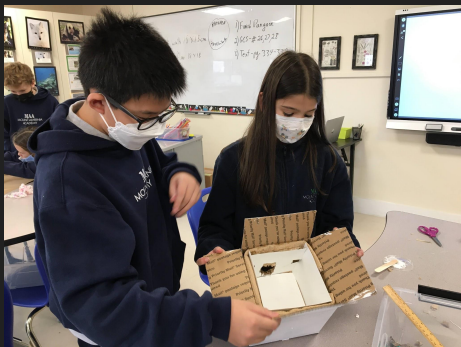




# Add Walls, Windows, Mortite, Weatherstripping

Heat would easily enter through the clear plastic in the windows, but wouldn't escape easily thanks to the covered windows! The poster board walls helped conceal the insulation, as well as make our house look nicer. Our door had weather - strip on the inside part of our door, so when we closed it, no heat escapes through our door. The mortite really helped seal cracks and crevices and in the poster board walls. - Caroline M.

We added the mortite to seal cracks in the insulation and added the weather stripping to the door to prevent cracks in the door. Some of us also added double windows for extra insulation. -Zoey B.



# Testing for Energy Efficiency

We all used insulation to test energy efficiency, and some of us used different products and insulated the windows twice. The insulation was done on the inside of the house. We then wrote our results on papers to see how well we succeeded in our projects. - Anastasia A.

## Data Collection

1. Room / outside temperature at start (°F): 78.1 °F
2. Insulated home temperature after 15 minutes (°F): 72 °F
3. Uninsulated home temperature after 15 minutes (°F): 75.2 °F
4. Difference (Δ) in temperature (°F): Insulated home 6.1 °F Uninsulated home 2.9 °F
5. Ice cube observations: Ice inside insulated home barely melted.  
Ice inside uninsulated home melted quickly.

## \*\* Conclusion

1. Analyze your home design and the insulating materials you used. How efficient was your insulated home at maintaining its temperature? What would you do differently if you could design your house again? What difference was observed between the insulated and uninsulated homes? Why is insulation beneficial?  
Insulation is beneficial because it saves energy. Insulated home needs less AC in the summer and less heat in the winter. I wouldn't change my insulation because it did its job properly and I used all the materials and remembered to block all the cracks.
2. Take a picture of your model homes. Complete your submission form.

## Data Collection

1. Room / outside temperature at start (°F): 63.8 °F Outside 76.9 °F Inside
2. Insulated home temperature after 15 minutes (°F): 81.7 °F
3. Uninsulated home temperature after 15 minutes (°F): 85.6 °F
4. Difference (Δ) in temperature (°F): Insulated home 4.8 °F Uninsulated home 80.7 °F
5. Ice cube observations: outside is 83.5 °F After 15 min, insulated home  
78.4 °F, Uninsulated home 80.2 °F, Ice melted more compare  
to the ice in insulated.

## \*\* Conclusion

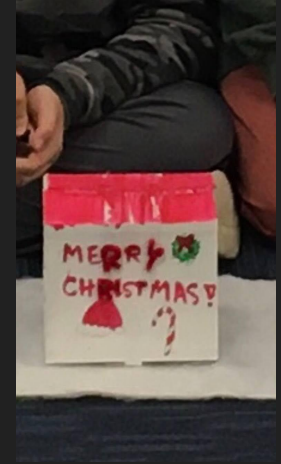
1. Analyze your home design and the insulating materials you used. How efficient was your insulated home at maintaining its temperature? What would you do differently if you could design your house again? What difference was observed between the insulated and uninsulated homes? Why is insulation beneficial?  
The insulated material can keep the temperature more constantly. I would like to add more insulation to the house, especially the Attic, windows, and doors. It is beneficial to save energy.
2. Take a picture of your model homes. Complete your submission form.
3. Email or mail this form and the picture of your model home to:

# Painting the Houses



We did a cheerful christmas theme with log cabins or candy cane homes with red, white, blue, brown paint. Some of us made a christmas themed group name (my group was named the gingerbread group). Many also used glitter glue because well, why not? Niara M.

It was fun experience being able to paint our house for the christmas season, light it up, and put it up for display -Peter.F

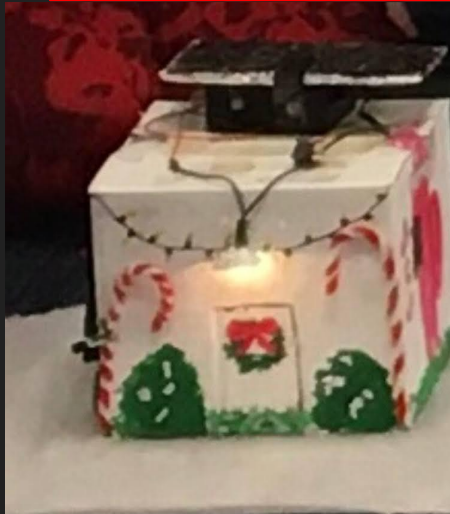




# Lighting and “Solar Panels”

For the lighting, we attached batteries to wires that were part of christmas lights and put electric tape around the ends to stay safe. Then, we taped the to the top of our houses and hid them with solar panels made out of cardboard and aluminum foil. -Orla

As we were finishing the finale touches to our house we realized that a house is not a house without lighting. We had to get batteries for our house and put the batteries into a little spot and attached two wired to make a circuit and once you did that you had to tape the wires together and power up the lights by turning on the light switch. - Cameron



# Making of Newtown Village

The biggest house is actually on a hill, the bottom box is not a house.  
Tess M

We actually put together stick people to make the village lively and we thought renewable energy town would be called Renewton because of newton. Niara M  
We used solar panels and wind turbines to make energy- CL



# Wind Turbines from Grade 4



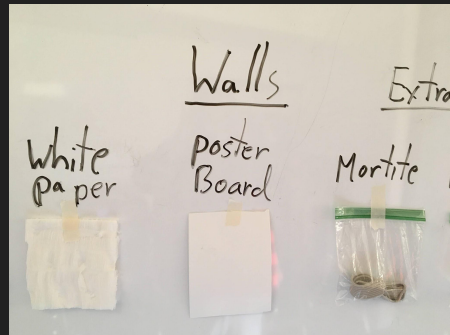
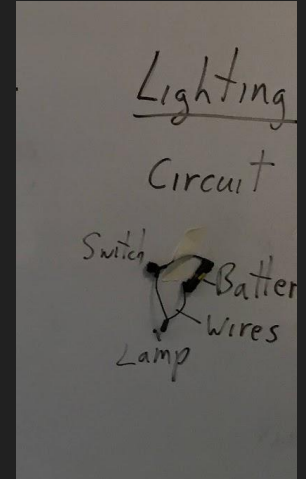
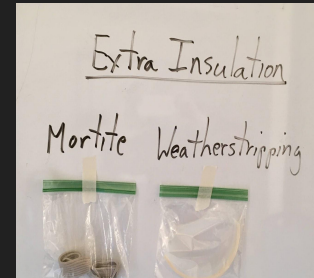
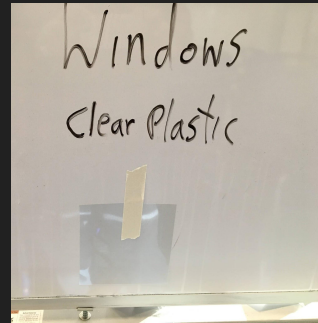
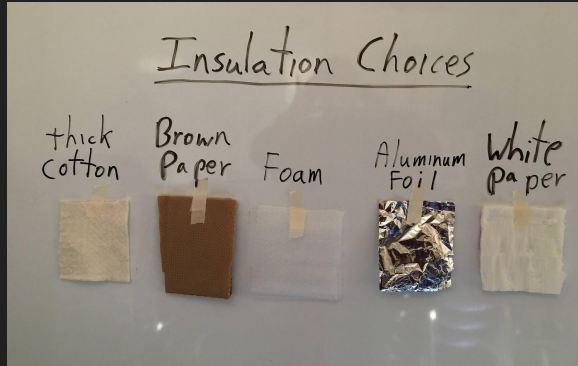


# Complete Village



# Presentation Board

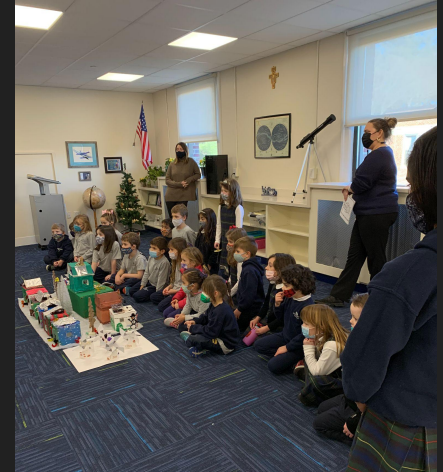
We had a team of people at the board with the materials we used and each person explained something on the board and what we used it for.-Lucia C





# Visits from Younger Students

We showed them what it was to have an renewable energy house and talked about the insulation, how we made it, and solar panels . Niara M





# Results

Students successfully conducted the NEED Science of Energy Investigations

Students studied Sources of Energy, and learned about Renewable and Nonrenewable Sources of Energy, what are they and how are they used.

Students constructed and experimented with solar panels, and wind turbines.

Students constructed the Energy House, following the NEED Guidelines, and successfully completed the Thermal Energy testing of the various insulations.

Students constructed electrical circuits using small Christmas bulbs to add lighting to their houses.

Students painted and decorated their Energy Houses.

Students successfully planned and constructed a village from their Energy Houses, meeting the energy needs of the village. They added “Solar Panels and wind turbines” to make their village into Renewton.

Students presented their project to younger students in the school. They loved seeing the village and listening to the presentations about how they made the houses, values of insulation, how to make a circuit, and the use and value of solar and wind energy.



# Thank you NEED !

## Favorite Part of Project

Our class loved decorating the houses because for each team, everyone got a say in how they decorated it, and different tables gave suggestions to others. Everyone was interacting with each other to create our colorful, vibrant Christmas Village. Orla R.

My favorite part of the project was using the clay and the paint SF I LOVED building the house.  
My favorite part of the project was putting the ice inside the houses.

