MAA | MOUNT ALVERNIA ACADEMY

STEM Fun Fair

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Mount Alvernia Academy students, in Grades 4 and 5, worked very hard preparing for the 2020 STEM Fun Fair. Unfortunately, due to the Coronavirus, they were not able to present their work. The students had researched topics, conducted experiments and activities and written reports. The students used material supplied by the NEED project and additional equipment. They were finished with their activities and were constructing their posters when school was closed. If school resumes this school year, we will have a STEM Fair, we could also have it in the Fall, if need be. We have also posted pictures of the students working on the STEM Fun Fair on the school's social media sites. This presentation will highlight the work completed by the students.

Goals

Through in class lessons and individual research, **students will gain a working knowledge of a particular topic** such as Physics - Energy, Matter and Motion, Biology - Animal, Plants, Fungus and Environmental, or Earth Science - Solar System, Weather and Global Climate Change .

In class, students conduct activities and experiments involving their topic. They make a hypothesis, take down data and observations and come to conclusions. **Working in teams, the students learn how to conduct an experiment using the Scientific Method and how to collaborate.**

Each team creates a poster with information about their work including descriptions, results and what they learned. There should also be a large drawing to help explain important ideas during the STEM Fair. **The students learn how to present their material, physically and verbally.**

The students present their work at a school wide STEM Fun Fair. During this time, the grade 4 and 5 students will allow the other students, staff and parents to conduct the activities and experiments with them. This is a hands-on STEM Fair. **The Grade 4 and 5 students share their knowledge with the entire Mt Alvernia Community at the STEM Fun Fair and the school's social media sites.**

In the days following the STEM Fair. Grade 4 and 5 students will visit all other classrooms to conduct a follow-up activity. This activity will involve Wind Power. They will each construct a paper pinwheel. **This provides all students with an additional hands-on activity on Energy.** They will also conduct an at home activity **to teach their families about saving energy**. Using the kilowatt meters , supplied by NEED, they will measure and compare the electricity usage by incandescent and LED bulbs. **The students become the teachers.**

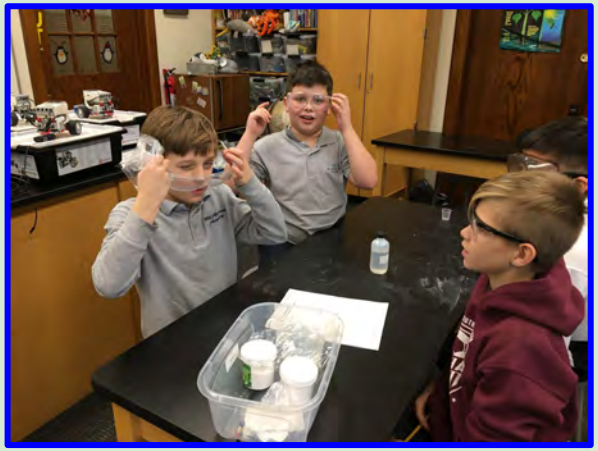
Energy

Energy is the ability to do work or cause change. Energy can change an object's motion, color, shape, temperature or other qualities. Energy is important because it gives objects power or strength to do something. There are many different types of energy like sound, light, electricity, chemical, magnetism and mechanical.

Paragraphs on this slide and the following were written by students. They are segments of their Research or Experiment Reports.

Researching

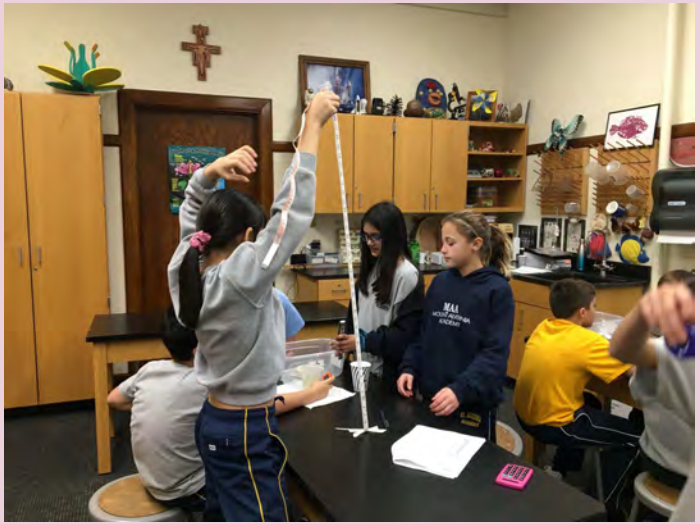
Conducting Experiments



Team Work

Making Posters

Grade 5 students conducted all of the NEED Project, Science of Energy, activities and experiments during their regular science classes. They were then separated into teams that specialized in one area of Energy or related science theme. Team topics included light, wind, electricity, motion, magnetism, chemical energy, thermal energy, sound, engineering and friction. In class, they conducted additional activities and were making reports and posters together with their teams. The students took turns being the leader of the team as the different activities and experiments were being conducted.



I was on the engineering team and I liked the activities. I learned that some shapes, such as circles, are stronger than others.

Potential and Kinetic Energy Motion

Potential energy is the energy a body has by its position relative to others. For example if you are high you have potential energy because of gravity.
Kinetic energy is energy which a body has by being in motion. For example if you are riding a bike you have kinetic energy.

Make a Rainbow

Hypothesis: I believe that the mirror in the water will refract the sun, which then will refract in the water and make a rainbow on the paper.
Procedure: First, we filled a bowl with water. Then, we put a mirror in the water, facing the sun. Next, we put a white paper above the bowl. Finally, we waited until the rainbow came on the paper.

Light

Radiant energy is energy that travels by waves or particles.It is electromagnetic radiation such as heat and x-rays. Some examples of radiant energy are the heat emitted from a campfire. Radiant energy can take the form of visible waves. Radiant energy can travel through space.

Chemistry

Results: What happened when we put the glow stick in the hot water the reaction with chemical energy made the time shorter so it got dim in at min and 30 sec. Also the reaction with the chemical energy and cold water made it last longer than its normal rate.

Conclusions: What happened was the chemical reaction interacted with the cold and hot water. Hot speeds up chemical reaction and cold slow them down. When this interaction happen the chemical energy turned into radiant energy and the cold make the glow sticks last longer or heat made them shorter.

Thermal energy is produced when there is a rise of temperature which causes atoms and molecules to move faster or even collide. Atoms and molecules of a hotter object have greater kinetic energy.

SAMPLE WORK GRADE 5 TEAM LIGHT

SOLAR PANEL FAN

Hypothesis: I believe that if I put the solar panel in the sun the fan will go faster. I believe that the sun will make the fan spin.

Procedure: We first put the cords on the connectors. Then, we put the solar panel in the sun. Next we changed the solar panels direction to the sun. Finally, the light was on the solar panel.

Results: The light hitting the solar panel made the fan move! The fan had spun really fast. We found out that you can’t use flashlights, and you can only use the sun.

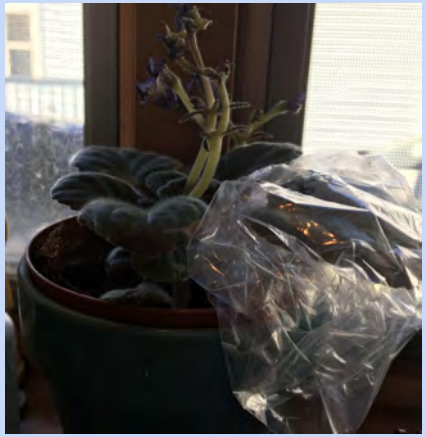
Conclusion: My hypothesis was right! If you put the fan in an area with a lot of sun the fan will spin faster. The solar panel fan works when the sun hits the solar panels, the light goes into the connectors,and within the panel, electrons are released making electricity. The light energy gets transferred into electricity and then into kinetic energy which makes the fan move.

Grade 4 students conducted activities on Biology, Physics and Earth Science during their regular science classes. They were then separated into teams that specialized in one area. Topics included animals, plants, fungus, ecology, matter, Earth, Sun and Moon, Solar System, weather and Global Climate Change. In class, each team finished their activities and experiments and were working on their reports and posters. The students took turns being the leader of the teams as the different activities and experiments were being conducted.

Plants

Photosynthesis: Is The process of light converting to energy by plants.

Photosynthesis is important because it is how plants make their food.

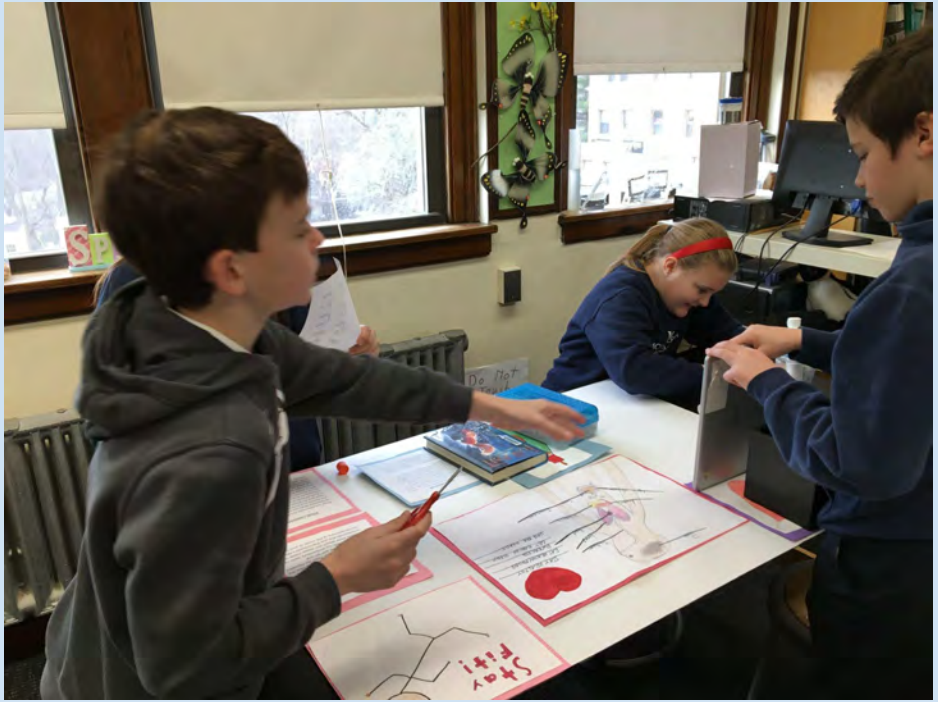


What We Did

We got 9 carnations
and then cut the stems.
We got 2 clear plastic cups
and filled it with water
and colored it with yellow,
green, and blue.
We put in the
9 carnations and waited
for the water
to go to the flower.

Matter

Object	Volume	Mass	Density
Wooden Block	27.3 cm3	226 g	0.8 g/cm3
¼ clay stick	71.25 cm3	145 g	2 g/cm3
½ clay stick	131.25 cm3	237 g	2 g/cm3
Gram Cube	1 cm3	1 grams	1 g/cm3

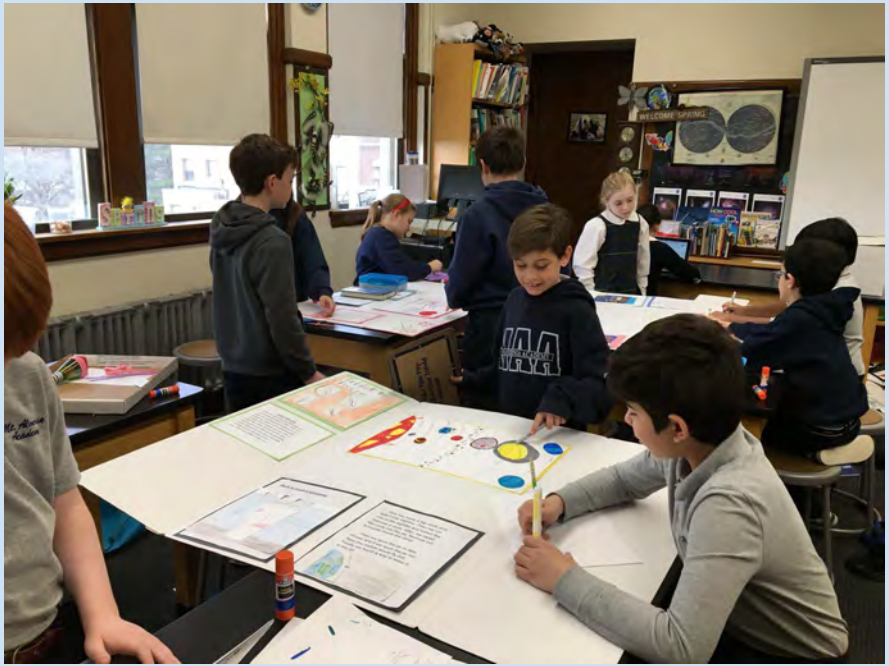


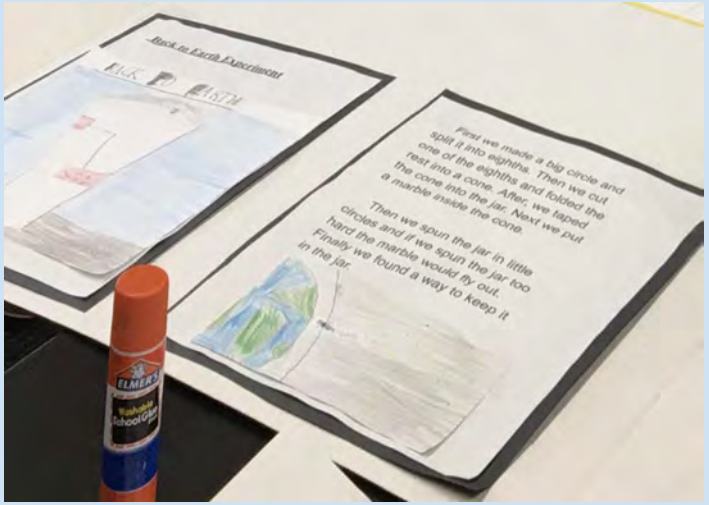
Human Body

I was in the Human Body group. I liked how we drew a huge picture of the upper human body. I learned that when we run, our temperature goes down!

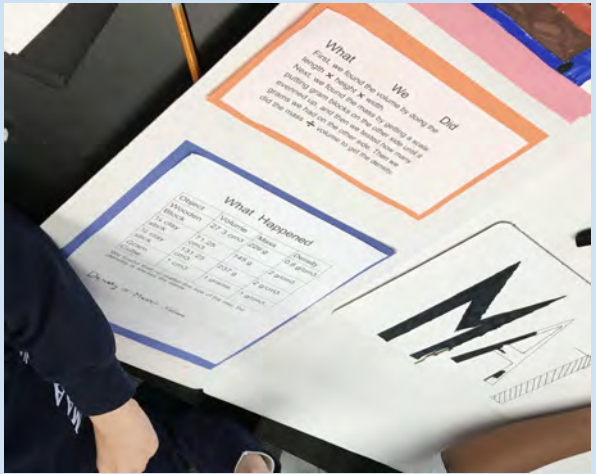
Solar System

I was in the Solar System group. I really liked learning about the planets and satellites. I learned that since there is a lot of carbon dioxide in fizzy water, the jar which it is in gets hotter because of the carbon dioxide.





Posters in Progress



SAMPLE WORK GRADE 4 TEAM GLOBAL CLIMATE CHANGE

MELTING ICE AND SEA LEVEL RISE

What We Did

What we did is we got two graduated cylinders and filled them with the same amount of water. In one of the graduated cylinders we put ice directly into the water to represent sea ice. On the other graduated cylinder we got a cylinder and put it on top , then we put ice in the cylinder that represented land ice. We waited a couple of hours to see which one would have the level of water higher.

What Happened

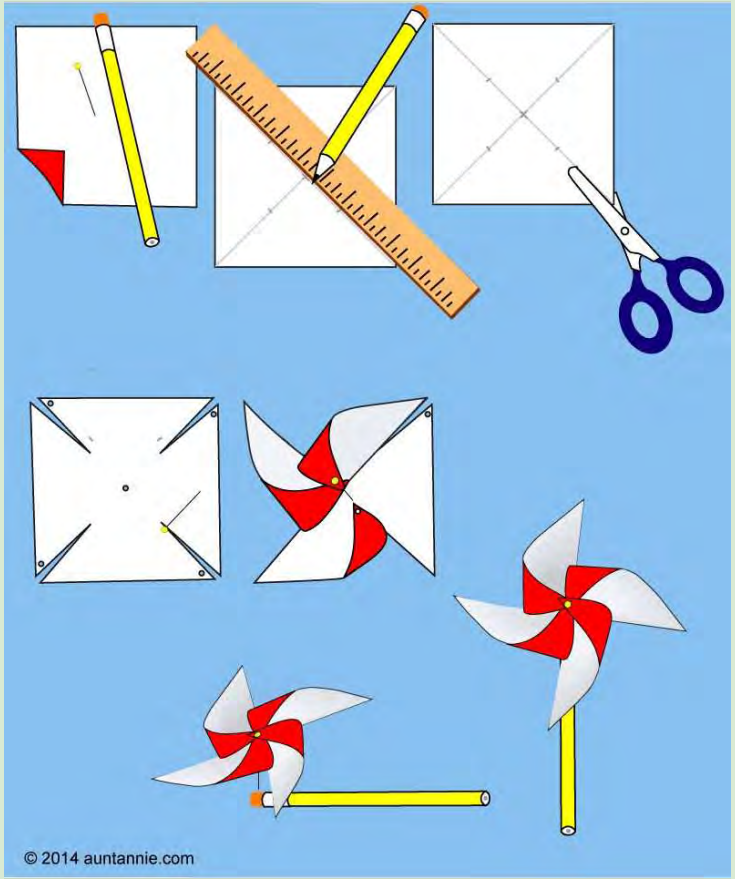
What happened was that the land ice increased the water level, but not the sea ice.

What We Learned

When the sea ice melts, the water level does not rise because the ice was already in the water. When the land ice melts, the water level goes up because you are adding to the water. This is what is happening in the ocean. Glaciers are melting and adding to Sea Level Rise.

The plan was to have a STEM Fun Fair on March 26th. During this time, students in grades 4 and 5 would set up their equipment and posters in the gym. Students from all other classes, staff and parents would visit and be able to work with the grade 4 and 5 students, conducting the hands-on activities with them and learning about Energy and other topics. The students become the teachers.

Pictures from STEM Fair 2019



This year we were planning on adding 2 follow-up activities. The first was in school. Grade 4 and 5 students will conduct a class in all other classrooms on wind power and each student will construct a paper pinwheel. The students would, again, become the teachers.

The 2nd follow-up activity will be at home. A few at a time, with their families, students will conduct the activity comparing incandescent and LED light bulbs, with the Kilowatt Meters, provided by NEED. The students will teach their families about saving energy.

Even though the students have not presented at the STEM Fun Fair, they enjoyed working on their projects and learned a great deal about their topics. They are looking forward to getting back to school and presenting their work.

Here are some student comments about working on the STEM Fun Fair.

I was in the Matter group. I liked that we got to do fun experiments that didn't really seem like they were for school, but they were buoyancy, density, and heat. I learned that if you put a bottle with a balloon on top in hot water, the heat will turn into air and fill up the balloon. It was sad that we couldn't do the fair

I am on the SOLAR team. What I like most about it is we got to make a nice rainbow and learn more about light. An interesting Fun fact I've learned is: White light= All the light color mixed together.

I was on team "Wind".I thought it was very fun because I learned that the windmills play a very important part in producing electricity for homes, offices,schools,ect.Some interesting fun facts I learned were probably what is voltage and what is an anemometer.

I was on team Engineering. The activities were very fun. One thing I learned about is the sail sizes on a boat is important.

I was in the matter group.I liked they way everything was well put together.I learned many thing about how matter was used such as the scales and how to measure it.

I was in the human body group. I liked that we made things and did lots of experiments. I learned that for us after we ran our temperature went down.

I was on team "Electricity". It was very fun because I learned a lot of new information that I didn't know. For example, electric currents, magnetic fields, and circuits.

I learned about the north and south poles on a magnet, electromagnets, and how they attract and repel

I was on team Earth, Moon, and Sun. I liked all the fun things we did. I learned all the Moon Phases.

Thank you NEED Project!