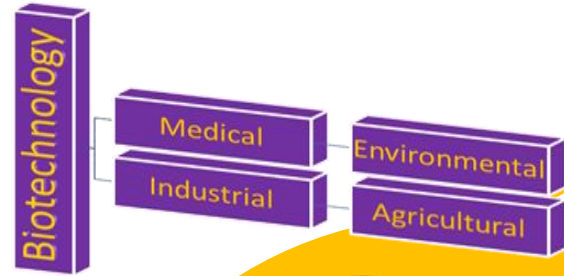


GARFIELD SCHOOL DISTRICT
 Elementary Program – Trimester 3 - 2022
 Instructor: Jenniffer DeWitt

Topic of Study:
We are exploring the world of BIOTECHNOLOGY!

Our Essential Question:
 What are the different ways **biotechnology** can be used in the fields of medicine, agriculture, industry, the environment and forensic science?



Gifted & Talented Newsletter

Our Vision & Philosophy

The purpose of gifted and talented education is to provide opportunities for highly capable students who meet on a regular rotational basis and engage in units of studies, activities, contests, and projects that will foster individual intellectual interests and talents while promoting critical and creative thinking.



“Education is the most powerful weapon which you can use to change the world.”
 - Nelson Mandela



The Third Trimester Activities...

The Carbon Cycle

The students began a study about Carbon. They learned that carbon is a very important part of our Earth and that it makes life on Earth possible. Carbon exists in many different forms. They explored the carbon cycle, which can be described as the exchange of carbon between the land, the oceans, the atmosphere, and the Earth's interior. There are two carbon cycles to keep in mind: 1) the geological carbon cycle (started billions of years ago) (2) The biological/physical carbon cycle that takes much less time (days to thousands of years) where carbon is exchanged between the atmosphere, biosphere, hydrosphere, and geosphere. Our young Engineers studied the different aspects of the carbon cycle and applied all this knowledge to create their interpretation and illustration of the cycle. They also completed a virtual lab experiment and recorded their data on a formal lab report. The students had a lot of fun becoming "carbon molecules" in a game that required them to roll dice and take a chance to see where they would end up next in the carbon cycle.

The Carbon Footprint & Global Warming

Some ways in which carbon is released into the atmosphere are respiration, burning of biomass, deforestation, and combustion of fossil fuels. There are some human activities that have been releasing too much carbon into the atmosphere such as fossil fuel combustion and deforestation. Today, people are concerned that the high level of CO₂ in the atmosphere is contributing to global climate change.

Engineers are working to rebalance the carbon cycle by reducing CO₂ emissions. For example, environmental engineers are studying how to remove carbon from the atmosphere (carbon sequestration), and mechanical and electrical engineers' design buildings, homes, cars, and appliances that use less energy. Engineers are also working to create technologies to capture and store carbon found in forests, oceans, and soils. We can help the engineers and scientists solve the global problem of climate change by remembering to turn off the lights, computers, and stereos when we are finished, take shorter showers, ride a bike, or walk, and talk to your family about recycling and other energy conservation measures. Global warming is



CogAT Testing

This March, the gifted students were given the grade level appropriate CogAT Test during our normal rotations. It is a challenging test, but our students used all their brain power to do their very best. I am very proud of them.





not a problem that we can leave for the scientists and engineers — solving this problem requires everyone working to save energy and reduce our consumption of energy. Biotechnology has a big role in solving this problem. The use of plant-based fuels and products reduce the amount of carbon emissions into the atmosphere.

We moved on to a virtual lab experiment on the Carbon Cycle. This showed the students that carbon has no direct path; it can go in many different directions or get stuck in the same state for a long time. The students were given a series of questions and tasks to experiment with. They recorded their data and answers in a formal lab report. This lab report contained all parts of the Scientific Method which are to observe, ask a question, form a hypothesis, make a prediction, test the prediction, record the data, report, and explain the results.



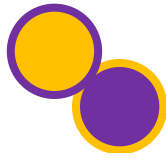
The First Carbon Neutral Toys!

Our students were able to make a major connection here! They previously learned that bio-plastic is our future and they actually created their own bio-plastic in a previous lesson in class. The toy company Mattel has just released the first carbon neutral toys. The toys are made from 100% recycled materials, are recyclable, and some are made from bio-plastic! The students were excited to see this and that they actually had made bio-plastic too. It shows that engineers are hard at work coming up with ways to reduce the carbon on our planet to preserve our Earth.



The "SMART" House Study

Our study began with the students viewing the story, "If I Built a House." This story depicts a boy that wanted to build the house of his dreams, complete with a racetrack, flying room, and gigantic slide. His limitless creativity and infectious enthusiasm inspired our young inventors to imagine their own fantastical designs. The students were given a challenge to design and create "Smart" houses. They worked in groups to brainstorm different ways that they could make the homes strong and protected from severe weather (insulation, waterproof features, built above flood plains, strong foundations and building materials, etc.). Then the students brainstormed ways that they could use cleaner forms of energy to power the homes, such as solar power or wind power. The groups then used the engineering design process to come up with ideas for the rooms they would like to include in their house. When designing their homes, they considered and planned for ways to make it "Smart," by including things like automatic light switches, thermostats, the clean energy uses, protection from weather, smart technology devices, and planned the functions each room would have. These designs would reduce the carbon footprint left on the Earth! They will also construct a house prototype design out of clothespins and popsicle sticks and use index cards to design different rooms for their houses.



The Trimester 3 Home Project



Our project continued the theme of engineering and its important role in our environment. Engineers can help us rethink the way we do these things so that we can reduce the amount of greenhouse gases we produce. For example, engineers are designing more efficient cars that use less gas and produce fewer greenhouse emissions. Engineers can also create products that can be reused more often, or they can create products using materials that have already been used by other people. For our project, the students were given the task to act as engineers responsible for designing products made entirely out of used items. This will help keep pollution levels low by saving our resources — such as trees, oil, and coal — that would be used to build a new product as well as putting fewer products in our landfills. This would reduce the carbon footprint which lowers the greenhouse gas caused by decomposing garbage. The students used the engineering design process to create an everyday useful product of their choice out of recyclable items and "trash." They used a "landfill" of reusable items, such as aluminum cans, cardboard, paper, juice boxes, chip bags,



egg cartons, milk cartons, etc., and were allowed a limited amount of bonding materials, such as duct tape, hot glue and string. This activity addressed the importance of reuse of items and encourages the students to look at ways they could reuse items they would otherwise throw away. The second part of their project was to look at their family's carbon footprint. The student and their family took a survey reporting the number of cars in the family; the number of air miles traveled throughout the year; used and analyzed their gas and electric bill to determine how many kilowatt hours and therms of natural gas used in their household over a year; and the amount of propane gas burned. These calculations were made to bring awareness of how carbon can build up in the atmosphere. Based on their results, they came up with actions that their family could take to reduce the Greenhouse Effect.

They were asked to think about:
How much waste do you think you create each day?

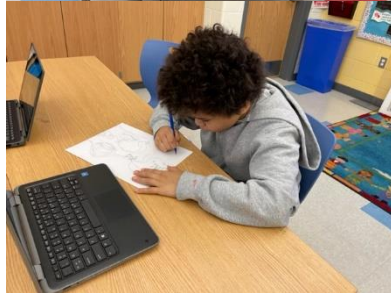
What kinds of things do you throw away?

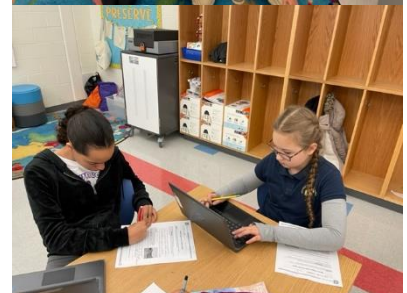
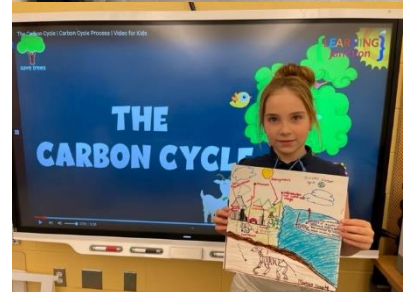
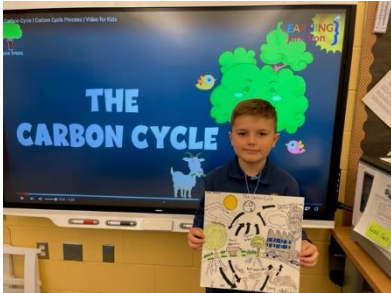
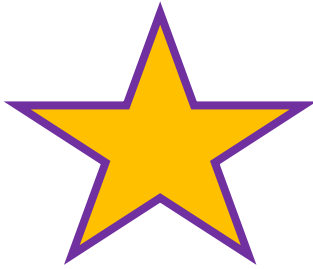
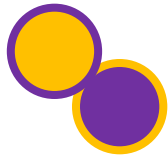
Which of these could be recycled instead of thrown away?

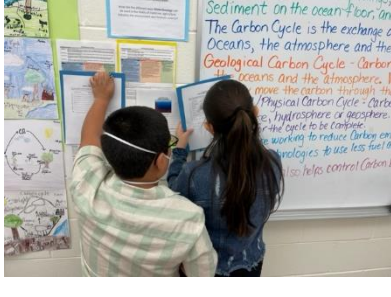
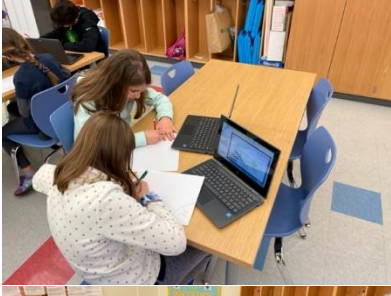
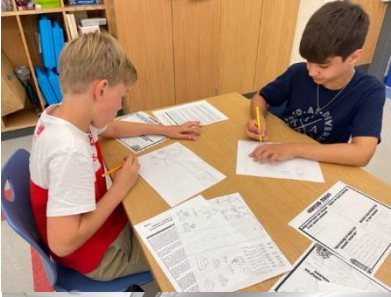
How could you change your habits to reuse more materials?

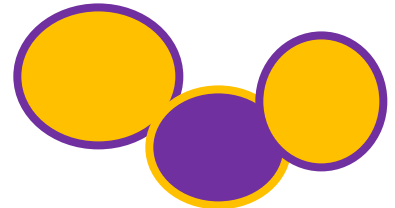
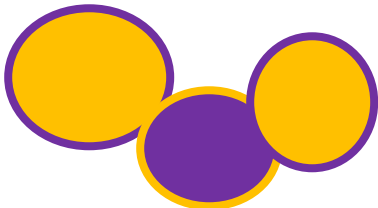
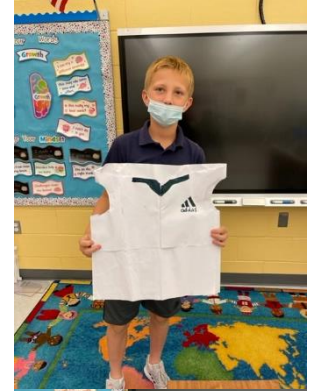
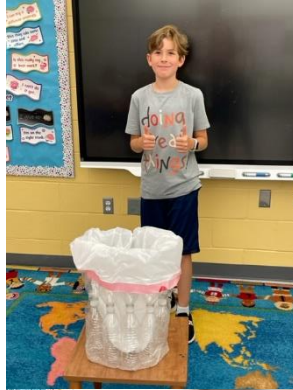
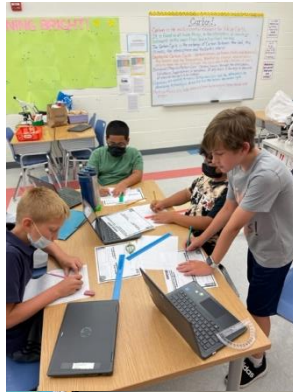
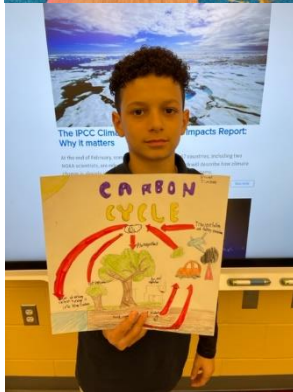
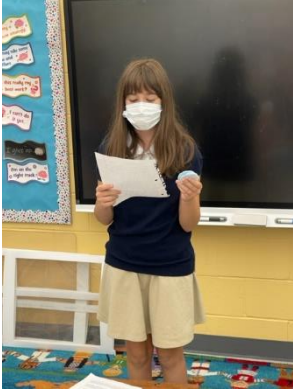
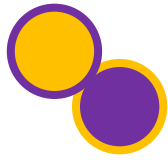
Could you use alternate forms of transportation?

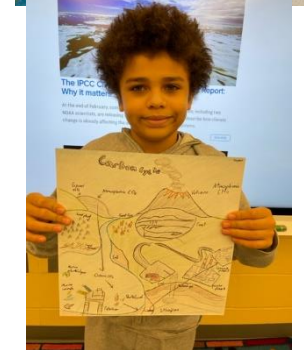
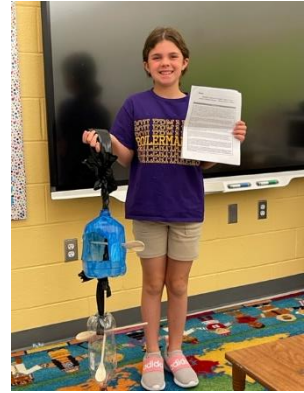
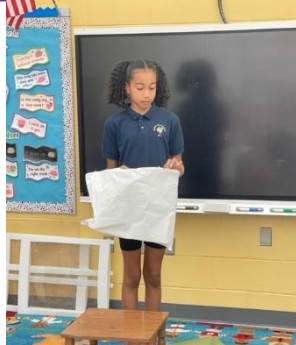
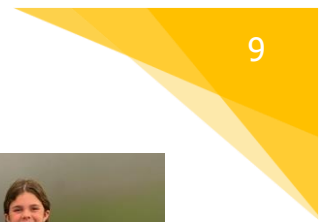
AWARENESS IS KEY!

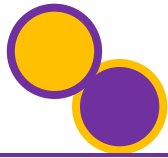












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