



مدرسة امباسادور  
AMBASSADOR SCHOOL  
INSPIRE INQUIRE INNOVATE



# STEAM Newsletter

January 2023

# MY WINTER HOLIDAYS

“Winter is not a season, It’s a celebration”.

Winter holidays are a time that gives us loads of happy memories. Students started the session by recollecting their cherished moments of their Winter holidays and demonstrated those memories through a build-up story on the given base plate using the Lego community starter kit. They had a lot of fun sharing their winter holiday stories with their friends using the models built.





# FORCE

A force is a push or pull upon an object resulting from the object's interaction with another object. It is a very simple, yet important, concept of science and engineering. Forces are used to move things around us. Students designed and constructed a safe swing that accommodated one person at a time. They followed the engineering and designing process to design and test a swing which will swing as long as possible after it is pushed. For safety, they built a fence around the swing. The concept of what is force? How it effects another object? What are the activities that could be created with the use of force was strengthened with “learning by doing”.



# ROCK AROUND THE CLOCK

It's not about "Having Time" It's about "Making Time".

Students planned and designed a clock to learn how to read a clock and know the time. It was a challenge for students to focus and give the answers. Encouraging students that they could have wrist watch soon if they read the clock with ease.

Later they played a game which enhanced their knowledge of understanding about reading the clock and tell the time easily.

With this students could place the numbers on an analog clock with perfection.





# LIGHT

In this activity, students designed and constructed the model of pinhole camera using LEGO community starter kit. Later, they explained and presented their model with one property of light, that light travels at very high speed in straight line.

The concept here was to understand how we see light sources and to analyze how light travels.



# LEGO MULTIPLICATION

As the first graders are just being introduced to multiplication, we decided to incorporate it in STEAM as it is fun for everyone . Students designed and constructed the model of Lego multiplication using Lego bricks. They learnt and revised the multiplication tables in a more visual and amusing method.





## WELCOMING MTINY ROBOT

Students were motivated to learn the basics of coding by using mTiny robot and coding cards based on the given challenge. They explored the use of two kinds of triggering programming blocks: the Input Card and the Go! Card. They caused mTiny to execute a set of commands continuously by using them.

Enthusiastic students were eagerly working on robots asking so many questions and interacting with the teacher to know more about how robot works and its application in daily life. Many knew how the cleaning bot at home works and they were curious to know more products of Robots that could help them ease their and parents job.



## PAINT THE TOWN BLACK

Knowing and speaking about shadows is always a task for most. This is made simple and easy to learn with the practical's in STEAM lessons. Students were shown the silhouette of certain buildings and structures, which they recreated using LEGO blocks and tested for accuracy by casting its shadow on a backdrop using the torch. Once they conducted this activity, most were able to tell that the shadow is formed when an object is blocked by a source of light falling on it. The shadow also changes depending on the source of light. It was interesting to see them applying this concept while they played in school observing the shadows on the ground, etc.,





## MUSEUM OF ROCKS!

Students as geologists created a museum of rocks using Lakeshore rocks and soil activity tub. They explored the properties of rocks by observing the texture, luster, color, and shape of different rock samples.

Their imagination had no boundary to express the uses of these rocks in various fields in daily life. Most of them were able to name the rocks that is used commonly at home like the marble.

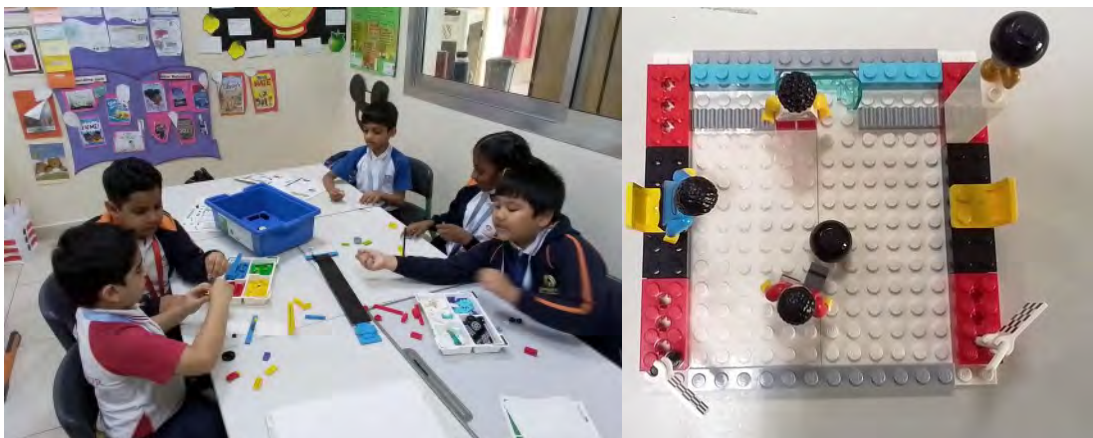
Few of them also shared how they could differentiate the rocks based on their appearance and touch. Many shared the ideas of developing hobby to collect types of rocks and small objects made from rocks, which was a great learning for students.



## DATA HANDLING

Students were set on a challenge to build a mechanism that can represent a track and field event. This activity was to give an idea of how the data is recorded on the system. The uses of data in different fields to compare and improve the scores in the exam of a particular year, study the growth of a company etc.,

Students learned about data handling in the form of tally marks. It was fun and interesting as they worked in pairs and compared the work they did. This activity also encourages children to understand the individual areas of their strength and weakness through the tally points. It was indeed a great learning and fun! Collaborative skills was witnessed very well during the presentation.





## ROCKS AND FOSSILS

Paleontology is the study of the history of life on Earth as based on fossils. Fossils are the remains of plants , animals , fungi, bacteria, and single celled living things that have been replaced by rock material or impressions of organisms preserved in rock. Students can be paleontologists if they have passion to study about the past.

Students of grade 2 were asked to create a fossil using Lego community starter kit. They demonstrated and understood that fossils form in sedimentary rocks. Students were explained that the sediment is buried deeply, it becomes compacted and cemented, forming sedimentary rock. Critical thinking and communication skill was observed .

Students could actually create, the fossil and impressions using the STEAM skills and present it to the class.



## FRACTION TOWN

Fractions are important because they tell you what portion of a whole you need, have, or want. Fractions are used in baking to tell how much of an ingredient to use. Fractions are used in telling time; each minute is a fraction of the hour. This concept is made easy to learn and apply through the STEAM activity for the students.

In this activity, students as mathematicians applied their knowledge about fractions, They identified fractional parts ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{3}{4}$ ) and were set on a challenge to construct fraction town using the Lego community starter kit.

Students completed the map of their new town based on fraction problems. Mathematical skills, creativity and innovation has become a part of learning through STEAM use.

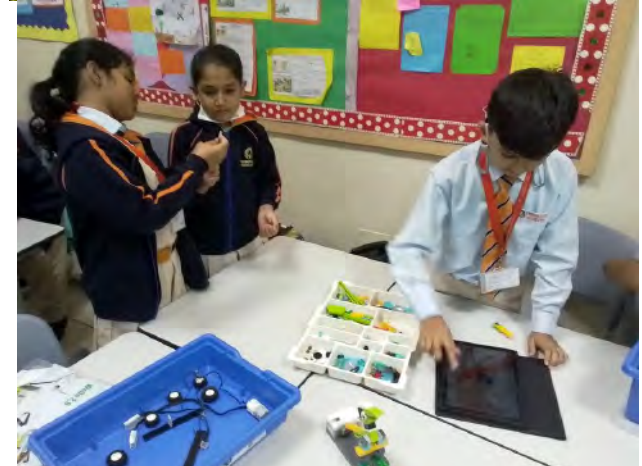
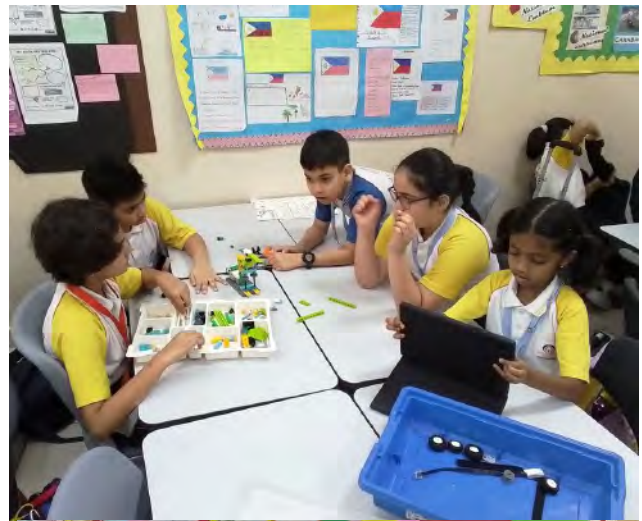




## FLYING BIRDS

Birds are an essential part of the natural system. They are essential as pollinators and for seed dispersal of many plants, especially native plants. Birds also feed on a variety of insects, rodents, and other small animals, naturally keeping those populations in check and ensuring a proper balance in their ecosystem.

In this session, students designed and built a mechanical bird that makes sounds which are activated by manually tilting the bird up and down to lift and lower its head and flap its wing. While they built the structure of bird, they learnt every part of the bird that helps them fly. Also they could relate their travel in the aeroplane and compare. They could have interesting discussions even with parents as every child has experienced traveling on air. They learnt about different parts of the bird as well as the process of migration.



## FIX THE BEAK

Bioengineers and biomedical engineers install, maintain, or provide technical support for biomedical equipment. These engineers combine engineering principles with sciences to design and create equipment, devices, computer systems, and software.

Birds use beak for eating, preening, manipulating objects, killing prey, fighting, probing for food, courtship, and feeding young.

In this activity, grade 3 students as bio engineers were set on a challenge to bio mimic a birds beak to learn how bird's use their beak for various life activities. They also could differentiate the features of birds beak that is suitable to do the particular task. Students were amazed and are able to appreciate the nature through these activities. Innovative ideas were very well appreciated!





## BIRD PARK!

Bird park is an area of land in which birds are protected and encouraged to breed.

It's a good ground for feeding, breeding and nesting for avifaunal biological diversity.

To understand the importance of birds in nature ,the care and protection to protect the endangered species students designed and constructed a bird park using Lego community starter kit.

They researched , named the birds and presented it to the class explaining how the birds in the park are managed .Few students shared how they care their pets at home. Amazing communication skill observed during the interaction.



## PARTS OF A PLANT

In this activity, Students observed and understood parts of a plant. They were challenged to design different parts of a plant from their imagination using Legos and explained about root, stem, leaves, flower and needs of a plant for growth and survival through constructed plant models.

Students identified and labelled the parts of a plant. They had a lot of fun doing this activity!

This activity allowed the students to work collaboratively and identify the environmental conditions of a plant's needs to survive in any given habitat.





## INTRODUCTION TO PLUGO

Plugo is an augmented reality-based interactive STEAM gaming platform. Students explored Plugo in this exercise by figuring out riddles like building an object that was later identified as an animal or an object with the use of a camera.

Teams of students also collaborated to complete activities that ranged in difficulty level from easy to complex. Students gained skills in teamwork, addition to those in problem-solving, creativity, and logical reasoning. Teams were happy working on Plugo and eager to continue.

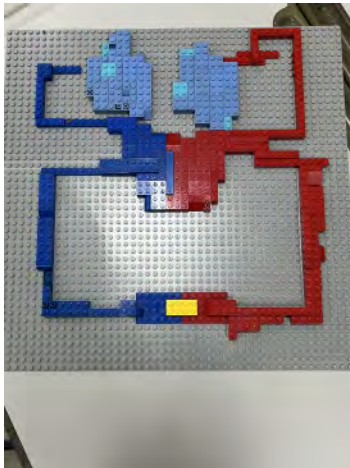


## THE HEART!

A fist-sized organ, the heart circulates blood throughout our body. It serves as our circulatory system's main organ. Following a very enjoyable Kahoot! quiz, students went on to the next objective of using Legos to construct a circulatory system.

Students were required to create an animation explaining the circulatory system's operation after constructing it, which they then presented to the class. A few questions regarding the circulatory system were posed as the program came to a close. The activity went well, and the children now have a better grasp of how the body's circulatory system functions.

Students also got tips to have healthy heart by exercising, eating healthy and having a healthy life style.





## MAP THE UAE

A decimal is a number that is divided into two parts: a whole and a fraction. Between integers, decimal numbers are used to express the numerical value of complete and partially whole quantities.

Understanding decimals is required to carry out daily tasks. In this project, students discover how the UAE's emirates, including Abu Dhabi, Dubai, Sharjah, Ras Al Khaima, Ajman, Fujairah, and Umm Al Quwain, divide their total geographical area. Students calculated the area in percentages with the help of their teachers and then rounded it to the nearest whole number given in decimals.

Students using Lego foundation plate built a map of the UAE after computation. Since Abu Dhabi accounted for 87% of the total area, the teams who started in ascending order were able to complete their maps on time, while the teams who started in descending order struggled. They identified the area of using math skills and teamwork.

The pupils' understanding of the use of decimals in everyday life was much enhanced by this amazing activity.



## KNOW YOUR PLANET!

The Sun and the asteroids that orbit it make up the gravitationally bound system known as the Solar System. The Sun, our star, and everything gravitationally connected to it, including the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune, dwarf planets like Pluto, dozens of moons, and millions of asteroids, comets, and meteoroids, make up our solar system.

Quick game called "DUMB CHARADES," in which one student from each table was brought to the front and given a term related to the solar system to act out, partners had to identify the correct response. Teams took responsibility to select a planet, research on it, and then use Legos to construct the planet's surface. Teams presented to the class to explain their design and its various aspects. The activity was enjoyable for the students, who gained knowledge about the solar system's planets' surfaces, atmospheres, and other characteristics.





## PLANET X

This is a continuation activity from last week here the teams of students were showed a short video explaining about the 9th planet, planet -x. Teams were given a task to design, build, name and present their imaginary planet.

Few teams designed innovative planets and others used the logic and scientific calculation to design it. It was a wonderful activity where students enjoyed building their own planet.



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## DREAM HOME

A percentage is a figure or ratio stated as a fraction of 100 in mathematics. Although the abbreviations "pct.", "pct.", and occasionally "pc" are also used, the percent symbol, "%," is frequently used to indicate it.

Students in this exercise assessed their mastery of percentages at the beginning of the lesson using a Kahoot quiz. The hands-on activity of designing and creating their ideal home using the percentages allotted for bedrooms, bathrooms, garages, gardens, and dining rooms began after the quiz, which inspired and energized the children. The overall floor space was first estimated, followed by the area of the other rooms, which was then transformed into the length and width of the room. The home was then built based on the floor plan.

They had the opportunity to present it to the class after construction along with their calculations. Teams utilized their understanding of % in the real world and enjoyed the activity.



## DESIGN YOUR SATELLITE!

An object in space called a satellite orbits or revolves around a larger object. Satellites come in two varieties: natural and artificial.

Students worked on artificial satellites throughout this exercise. Teams of students viewed a brief video on "The Story of Satellites" before being quizzed on it. After the discussion, the students were given work that involved researching a specific kind of satellite and taking notes on its design, functionality, and characteristics. The next step required teams to create their own satellite using the program "TinkerCAD" and present it to the class.

Students worked as scientists and engineers to learn about the informations provided by the earth's satellites.



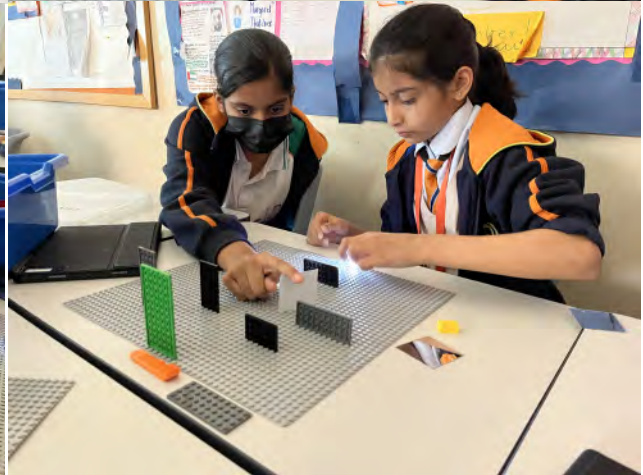
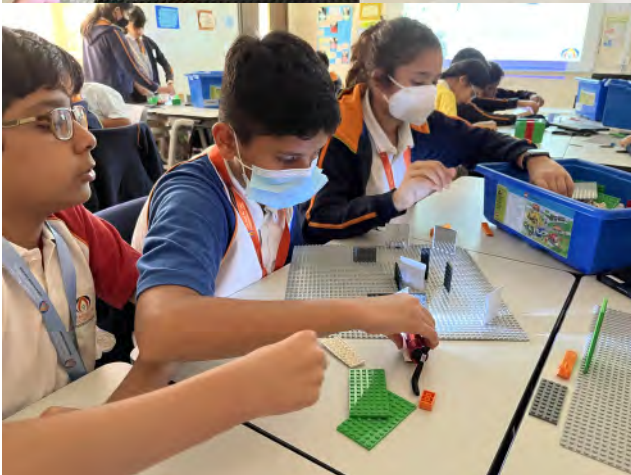
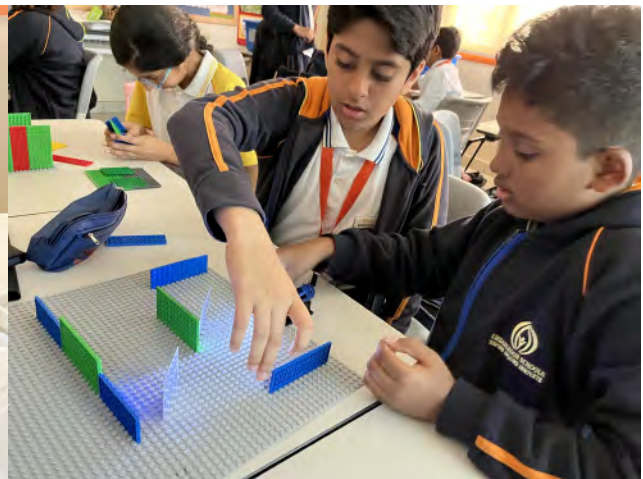


## LIGHT MAZE

Groups of students participated in a quiz on light and shadow before being challenged to create their own light maze. Students had to use the laws of reflection of light to navigate through three different types of light mazes. Students conceptualized and created the LEGO maze, which they then attempted to navigate using a torch and mirrors.

The skill to place the mirror at an angle to observe the reflection of light on the multiple mirrors.

Students summarized their experience and compiled a report on reflection of light. The correlation of mathematical concepts the angle and its use while placing the mirror was applied. It was real experience to observe the different presentations and creativity in each group.



## CARGO CONNECT

The First Lego League task, "Cargo Connect" project, helped students to fortify their skills in critical thinking, creativity, and other abilities. The Cargo Connect challenge mat consists of 15 different mission types that students, working in teams, must complete in 2 minutes and 30 seconds utilizing a programmed robot and various attachments.

Students were tasked with completing missions with a LEGO EV3 robot in this activity. Teams planned to complete a select few missions while competing with one another. They were given the task of creating an attachment and programming the robot to complete the assignment in the shortest amount of time. Through this activity, the teams learned how crucial time management, planning, teamwork, creativity, and problem-solving are in everyday life.





## MAKE DIRTY WATER DRINKABLE!

Our activity session in Week\_2 started with a TED talk. The motivating video maps the journey of a man explaining his experience of how he came across the challenges faced by people of different communities not having potable water which motivated him to innovate a feasible water filter.

After the video, students in teams were given a sample of dirty water and asked to observe it and note down the possible impurities present in water and then asked them to plan the water filter based on the given materials. Teams planned and designed their water filter and tested it by passing the dirty water and tried to clean the water.



## CELL AWARENESS!

Without study, medical scientists and clinicians would not be able to determine whether novel medicines are superior to our present treatments. This is how medical professionals discover the best treatment options for our patients.

Teams of students began Week\_3 activity with a fun quiz on cell structure before moving on to a more serious note. The job scenario involved selecting an illness—such as cancer, Lou Gehrig's disease, muscular dystrophy, or Alzheimer's disease—and researching its effects on human cells. Following their research, students used a stop motion animation tool to create an animation, which they then presented to the class. Students gained knowledge of the impact of illness on human cells in this way, and eventually a conversation about the origins of disease and how to prevent it ensued.





## BUILD TO CARRY

A mechanical tool that modifies a force's direction or strength is referred to as a simple machine.

Teams of students took part in a quiz on simple machines as part of Week\_4 activity, following which they were given the challenge of lifting a hefty battery and delivering it to a distant location. Teams prepared the mechanism, designed it, and built it, although they were unsuccessful in moving the battery. In order to give the kids one more chance to successfully transport the large battery from one location to another, it was agreed to carry on with the task.

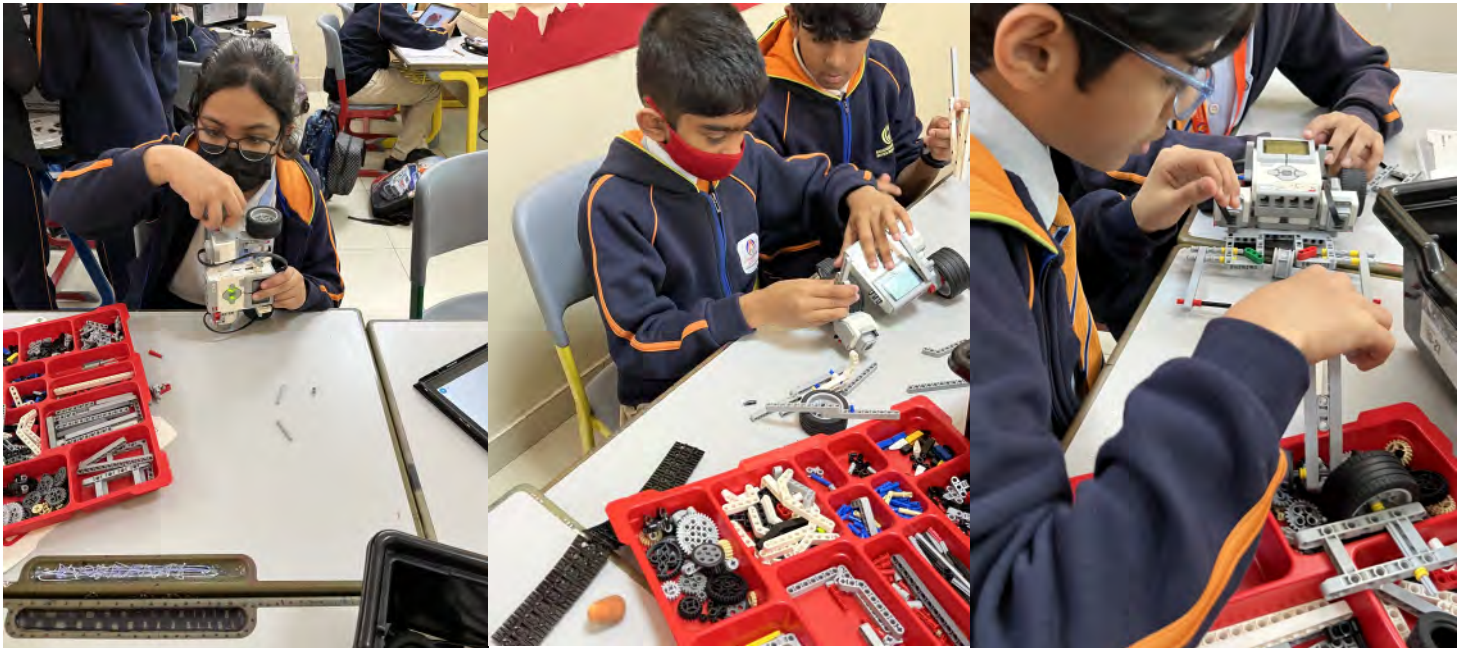


## BUILD TO CARRY-2

Students continued the Week\_4 activity. This time round, teams were tasked with coming up with a device that would transport a large battery from one location to another using simple machine concepts.

Teams come up with several strategies for wheel-and-axle pulling or pushing the battery. They constructed the robot and a cart to pull the bulky battery. After testing, they concluded that the machine needed to be modified since the force needed to push or pull was insufficient.

Overall, the activity simulated a circumstance in which moving a big thing is challenging but can be made simpler by employing simple machines.





## CODE THE DRONE!

The students had already been introduced to the Air Block Drone, but the drone still needed to be coded.

During week \_1 the Grade 7 student teams learned how to code the drone and get the required outcome. Moving the drone in a small space, like a classroom, is challenging, but code can make it simple. Teams then programmed their drone to move it from one location to another. During testing, a couple teams discovered the problem and changed the code to make the drone move correctly. Teams were thrilled to watch their drone go from one location to another during this excellent activity.



# RUBE GOLDBERG CHALLENGE!

A gadget called a Rube Goldberg machine is one that accomplishes a straightforward task by means of numerous steps.

A brief film outlining the task was shown to the teams during this activity. The students were instructed to create their own Rube Goldberg device with this concept in mind that runs without the need of motors on renewable energy sources such as potential and kinetic energy. Success was determined by employing a minimum of three separate simple machines, and the team with the most machines operating in the model was proclaimed the winner.

A last request was for teams to create an energy diagram of their machines and present it to the class after many teams had designed successful devices but only a small number adhered to the success criteria and that's how the learning journey continues.





## LIGHT HOUSE!

Students in teams worked as an electrical engineering to design and build the electrical circuits. Teams were first introduced to the Tinker CAD circuits and then asked to explore it by designing a simple circuit of lightening a bulb and then simulate it to test its working.

After building the circuit and exploring the application they were asked to design and build a circuit of their classroom having lights, projector, ac and switches. Teams first counted the appliances required and then checked the connection types, series or parallel and then designed the circuits and tested it using the simulation feature.

The real life connection to electricity helped students learn about the role and responsibility of an electrical engineer.



## MAGLEV- THE MAGNETIC TRAIN!

Two sets of electromagnets are used in the Maglev (short for magnetic levitation) train transportation system, one set to push the train upward and the other to repel it.

In this game, teams of students took a quiz on magnetism before being assigned the task of creating a maglev train bogie. Using supplies including magnets, cardboard, tape, scissors, and other items, the teams then planned to construct a maglev train. After the structure, they tested moving it along the track. Only a few teams were successful on their first try; the others made modifications and retested. Teams realized the significance of magnetism in transportation and adhered to the engineering design procedure. Teams intended to carry on their activities the next week.





## LASER YOUR MAGLEV!

Teams of students were challenged to use the laser box program to build their own laser chassis and then use a laser cutter to carve it out. A few teams wrote the name of their maglev or carved their or their team names on it before laser cutting the chassis; this exercise educated teams about proper measuring.

Teams designed their maglev chassis using the laser box and worked on the arts parts of it as well. Some chassis couldn't fit the track due to size alone, while others were too small to function properly. In order to increase their maglev speed, teams calculated it as well.



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## BUILD THE THERMOS!

An online test on heat transfer was given to teams of students to kick off the lesson. After the test, students were instructed to use the Sparkvue app and a Pasco scientific temperature sensor to measure the room's temperature. They were given water and ice to test how long it would take the ice to melt after determining the temperature of the room.

Teams were given the task of designing a thermos utilizing plastic cups, cloth, tissue paper, and aluminum foil, with the restriction that only 1 material be used to construct the thermos. The goal was to increase the time that ice would take to melt. Teams attempted using tissue paper but were unable to test the other materials, so we decided to carry on with the task.



## BUILD THE THERMOS - 2

This was a follow-up project from last week in which students were reminded of the previous task and instructed to examine the provided materials to determine which material takes the longest to totally melt the ice.

Teams constructed their thermoses using various materials, and they verified from the graph that the material that had the fewest curves was the best one to use. To further support this, they were introduced to the concept of rate change and told that even by calculating the rate change, we can determine which material is best and can minimize heat loss.

Building their own thermos was a fun task that teams presented to the class.



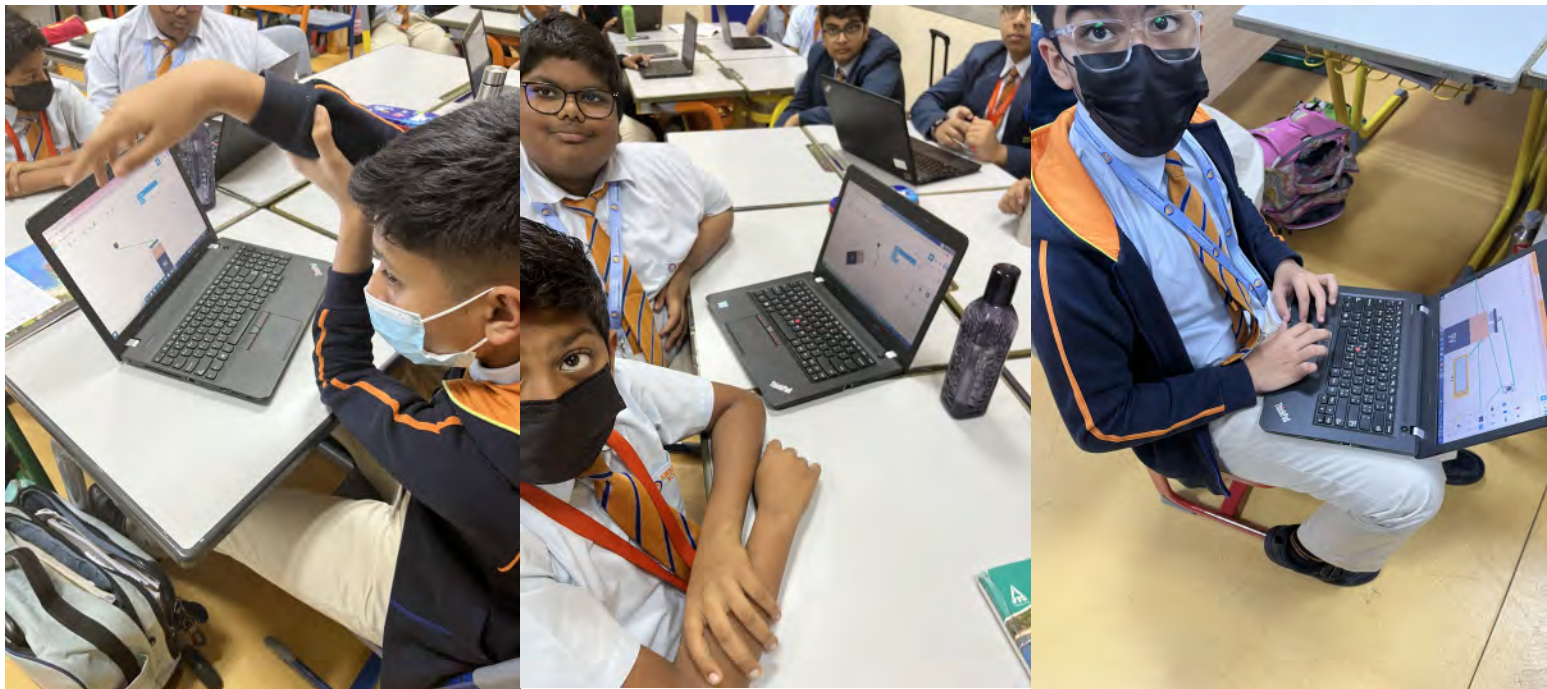


## FIX THE CIRCUIT!

The session began with a quiz about electricity in which teams competed for first, second, and third place. The quiz was enjoyable for the students, and they next learned about Tinker CAD circuits, where they discovered how to create a circuit in the program and evaluate its functionality using simulation.

Following the introduction, they were tasked with creating a circuit to illuminate a bulb, and they were then challenged to create a circuit diagram for a classroom.

Students learnt how an electrical engineer actually works through this fantastic project.



## FIX THE CIRCUIT - 2

Teams of students began the session by referring to it as an extension of the prior one. Teams examined the classroom during this session and calculated the usage of various appliances, including lighting, air conditioning, projectors, etc. They identified the various circuit types utilized in the classroom, such as parallel or series, then built the circuit in Tinker CAD circuits before simulating it to check for appropriate operation.

Teams used sliding switches, which were unfamiliar to them. After figuring out how to use the three terminals, they connected their circuits in series and parallel, much as they would in a classroom. An actual connection to electricity and circuits was made during the exercise.

