



مدرسة امباسادور  
AMBASSADOR SCHOOL  
INSPIRE INQUIRE INNOVATE



# STEAM Newsletter

November & December 2022

## MY CITY OF LEGO!

What if you could build a better world? Where would you begin?

In this activity, grade 1 students as architects and civil engineers, were given the task of designing and building the Lego city using the Lego community starter kit and purchasing it using currency. They were inspired to work together, innovate, solve problems and find a solution to build a thriving community filled with inspiration, creativity and hope for a stronger, more sustainable future. They explored that technology can help make cities sustainable by reducing pollution and wastage through innovation.

Later, they were given an opportunity to design a digital poster of their Lego city and price tag each building or tower in their city using the story visualizer software.



## RAFT

Our first graders began with an activity float away that involved them building rafts using LEGO and testing the raft by blowing or waving the lid of the box as a “breeze-maker” while a wind pushes the sail.

Students explored balance and buoyancy, pushes and pulls and wind energy. Our first graders still knew how to 'move it move it'!!



## MEASURING CAR

In this activity, 'How far' wherein the students had to build a measuring car using Early simple machine and test their model by measuring the distance with a measuring tape.

They analyzed the distance traveled by recording their readings obtained on the scale.

They explored the mechanism used in car enabling the motion of the vehicle (wheel and Axle).

Students were introduced to one common unit of measurement and they used it for measuring distance.



## SEE SAW

Students designed and constructed a seesaw based on the principle of balancing machines to demonstrate the concept of weight measurement. They measured the weight of given blocks and kept the required number of blocks on each side of the seesaw to investigate how the variation in weight on each side affects the movement of seesaw/balance go up and down. They kept adding weight on both the sides of the seesaw until static equilibrium is achieved, which happens when the mass/weight on each plate is equal.

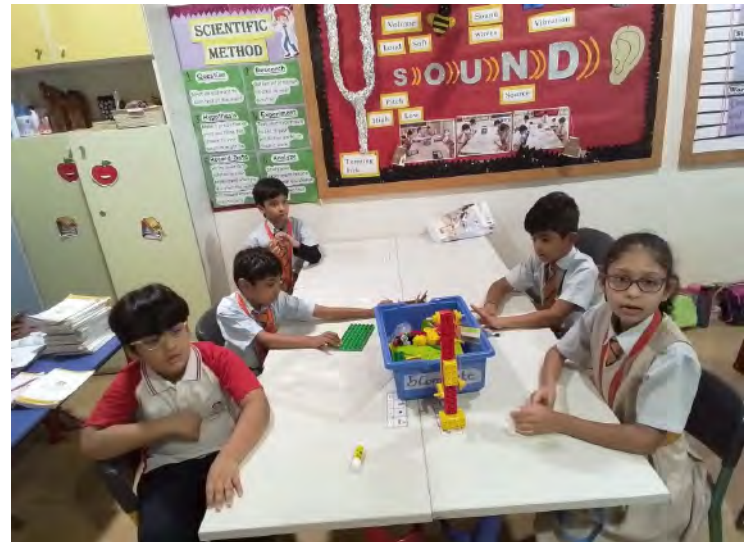
The model of a seesaw turned out to be a very supportive tool of learning for the students to understand and visualize the concept of heavy and light.



## HOIST YOUR FLAG

Students designed and constructed a flagpole focusing on a pulley mechanism. They also designed a flag and used the constructed flagpole to hoist their flag that represented their family for a neighborhood parade.

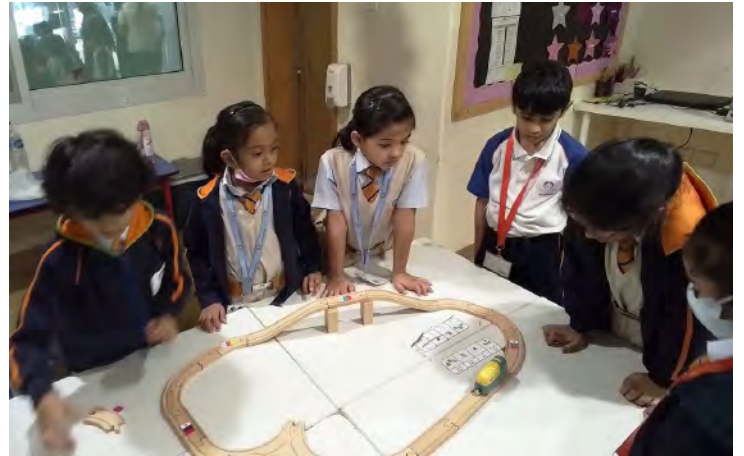
They demonstrated the importance of flag as national symbol for a country.



## TRAVELLING TOGETHER

Students designed and constructed a vehicle that would help to transport people or things from one place to another. They built the different models of transportation using the blocks and made the brick to stop at particular stations using coding express.

They applied the concept of measurement while constructing their vehicle.



## NEED A LIFT ? TRY A PULLEY

In this activity, students were introduced to Lego BricQ motion Essential and briefed about the different parts of the kit. They were challenged to design and construct a well-like civil engineer which would help the villagers to draw water out of the well. They constructed a pulley for the well and analyze the mechanism.

Students demonstrated the use and application of various simple machines (lever, pulley and gears) while designing . They tested their model and redefined it to attain the objective. Each group explained the mechanism of their model designed for perfection.





## LIFT IT UP

Grade two students followed the engineering and design process (planning, design, construction, testing, analysis and modification) to build a tow truck demonstrating the gears and pulley mechanism. They tested, investigated and concluded how its function is influenced by changes in the pulley and gear system.

By applying the concept of multiplication, students develop their mathematical skills and be prepared for real-world application.



## SORT TO RECYCLE

In this activity, students were given a real life situation of designing and constructing a Lego recycling trash bins and a truck to sort recyclable objects using Lego community starter kit.

They identified what basic materials could be recycled and demonstrated physical separation of substances.

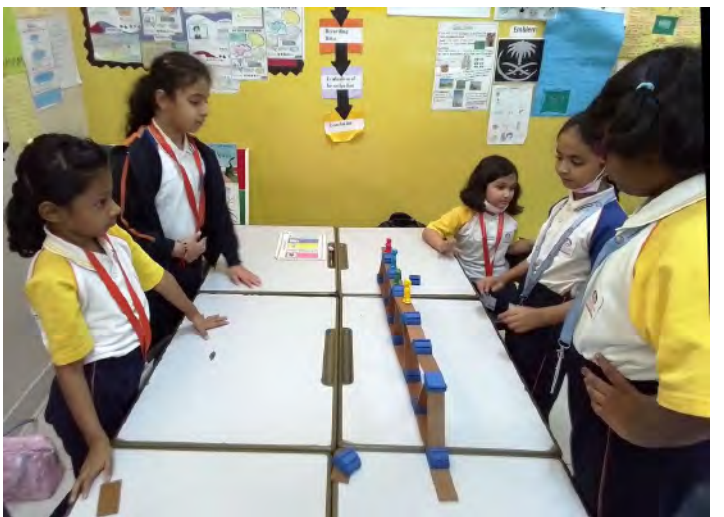


## BRIDGE THE GAP

In this activity, students designed and constructed a bridge using plant products that should accommodate at least 2 people at a time.

They followed the engineering design process, designed and tested the model bridge the gap so that people could cross the forest safely.

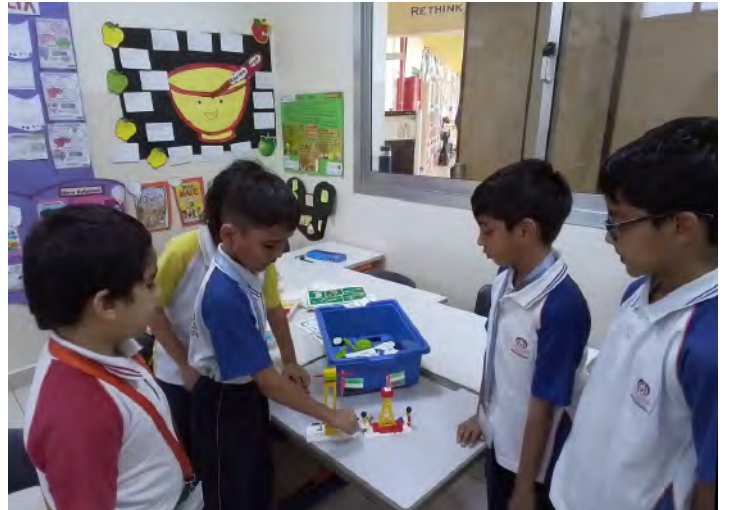
It was a delight to see some of the students build triangular trusses for the bridge!



## RAISING THE FLAG

Students designed and constructed a flagpole focusing on a pulley mechanism. They also designed a flag and used the constructed flagpole to hoist their flag using LEGO BricQ motion essential that represented their family for a neighborhood parade.

They demonstrated the importance of the flag as a national symbol for a country.



# SHADOW PUPPET THEATRE

Students applied their knowledge of light to create a shadow puppet show in their designed Lego mini-theater.

They investigated how the size and shape of their shadow puppet changes with the variation in distance from the light source.

The main objective of this lesson was to explain and model how a light source close or far from the object affects the size of the shadow.



## NEED FOR SPEED

Robotic Engineers of grade 3 constructed a robotic car demonstrating gear mechanism. Students in teams tested their model on different surfaces and measured the distance traveled between the starting and finish line.

They were able to explore the different forces acting on the moving car. Through this activity the reasoning and questioning skills are enhanced, allowing each one of them to investigate, reflect and conclude .

In the process, simple skills like the use of measuring tape, units of measurement and calculations were incorporated into their learning. It was more fun learning outside the classroom.



# JOURNEY TOWARDS THE SOLAR SYSTEM

The relation between the Sun, the Earth, and the Moon was explored; i.e., the rotation and revolution of Earth around the Sun, and the Moon's revolution around the Earth. Firstly, they built the 3D models of Sun, Earth, and the Moon using LEGO WeDo 2.0. To understand rotation and revolution motions, the students were introduced to the world of gear mechanisms.

They explored mainly three facts of the gear mechanism, namely:

1. Only when a gear meshes with the other gear, the motion is transferred.
2. When force is applied to one gear, the motion of the other gear is in the opposite direction.
3. When a larger gear is connected to a smaller gear, the larger gear moves relatively slower than the smaller gear.

With the above knowledge, the students designed a mechanism to show the relative movement of the Sun, the Earth, and the Moon.



## STEP ON THE MOON

The moon is the natural satellite of the earth and the closest place in space that we can go to. How can we get more information about our nearest neighbor, the Moon?' The students explained that we cannot live on Moon without proper gear, so we need a machine to do it for us.

They built a rover using the building instructions from WeDo 2.0 kit. They programmed the rover to move on a surface and the Motion Sensor wait to detect motion in front of it and give out a sound.





# DESIGN YOUR CONSTELLATION

In this activity, students designed and constructed their constellation by tracing the dots and creating a 3D model using Lego community starter kit.

Later, they found the perimeter of the constellation by measuring line segment.



## MARCHING PARADE

In this activity, students designed and constructed a float in a parade demonstrating U.A.E national day celebration. They also designed and constructed a car to place the float up on it.

This activity enlighten the students about the importance of U.A.E national day celebration and how floats are an important part of the parade making it more interesting and livelier.



## TYPES OF HOUSES

In this activity, Students designed and constructed different types of houses using Lego community starter kit.

They also identified different types of houses in which people live.

Students analyzed how the weather and temperature of any place can change the style of houses.



## FRACTION CITY

Fractions are an indispensable part of our life and without even realizing it, we constantly use fractions in our day-to-day things.

In this activity an application “Draw bricks” was introduced to the students and they were asked to explore it by making a house. A challenge was introduced to the students that they need to design a city using their knowledge of fractions called “fraction city”.

Students designed the city by building houses, roads, trees, cars etc. and then they explained the fraction by picking up different things such as particular types of trees out of total trees, number of independent houses upon total number of houses etc.

Students enjoyed building their own city and presented it to the others.



## CLEAN IT TO DRINK IT!

By using water filtration, contaminated water can be transformed into pure, healthy water. As a result of increasing pollution, water filtration is becoming more and more necessary, and is imperative to maintaining safety and health.

Teams of students utilized the Lakeshore Fresh water filter activity tub to purify the water during this project. In each team, a safety officer was designated. Based on the materials used for the activity, the safety officer prepared the team's safety regulations and, with the teacher's consensus, conveyed them to the other team members. He was also responsible for monitoring his staff to make sure everyone was strictly adhering to the guidelines.

The team was instructed to create the processes for cleaning the water together with the safety regulations. Teams outlined the procedures and gathered the supplies needed to purify the water. Using the water filter kit to make a filter, they cleaned the water by running it through the filter multiple times. After the water filtered they calculated the fraction of filter water and dirty water.

Children enjoyed performing filtration procedures including sedimentation, filtration, decantation, and so forth.



## DIGEST THE STORY!

The human digestive system consists of the gastrointestinal tract plus the accessory organs of digestion. Digestion involves the breakdown of food into smaller and smaller components, until they can be absorbed and assimilated into the body.

In this activity students in teams challenged to create an interesting animated story of digestive system using LEGO and stop motion animation.

Students in teams first created the digestive organs starting from the mouth and then using the LEGO only they have created some food items and showed how the food travels to different digestive organs of the body starting from mouth and at the end the leftover food or waste removed from the body. In this step the teams used their creativity by showing different food color items passing through different organs. Some paid attention to the size of the food as well while moving from one organs to the other.

Few teams finished the animation before time and they had edited their animation and also did the voice over to explain different functions of different parts of digestive system.

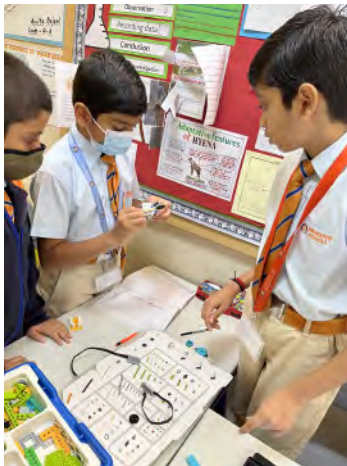
Finally, all the teams had showcased their digestive animation to the class, they were excited to know who did the best animation. Teachers after given their feedback on the animation, selected the best team.



## BRUSH IT!

Oral health plays a huge role in overall health and well being. A huge part of taking care of your oral health is brushing your teeth and there's a certain science that goes behind finding all the right crevices to clean. Position your toothbrush at a  $45^\circ$  angle to the gums. Gently move the brush back and forth in short, tooth-wide strokes. As part of oral health activity, students built LEGO teeth and filled the cavity with clay. After adding the cavity, they were instructed to try to remove it with the toothbrush while noting any difficulties.

They were then inspired to construct a LEGO electric toothbrush utilizing LEGO pieces, a motor, and a hub to remove cavities in the build teeth and solve the problem of manual toothbrush. Few teams developed original, imaginative ideas and designs. After creating their own electric toothbrush using LEGO, students were very satisfied with their work.



## FUTURISTIC CITY!

Due to the rapid change in technology and our way of life, we anticipate future solutions to our existing difficulties. In this project, students were urged to create a futuristic city that will address issues with contemporary cities, including traffic, pollution, sustainability, safety, etc.

Students used Lego Community Starter to plan and create their futuristic metropolis in teams. Students conducted research, identified issues in contemporary cities, and then attempted to provide solutions in their own cities. Teams were asked to present in front of the class after finishing the models and explain their thoughts.





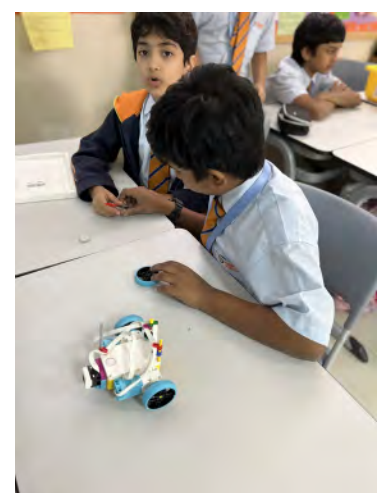
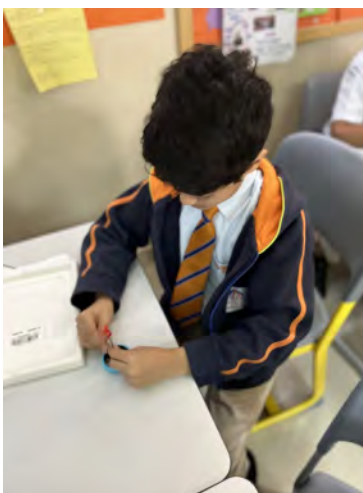
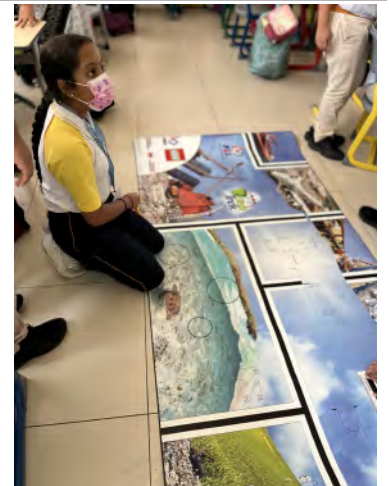
## CALCULATE YOUR MOVE!

Calculate your move is an activity where students in teams needs to calculate the distance covered by the robot in centimeters.

Students used the pre build Lego Spike Prime robot and coded it to move for 1 rotation and then using the ruler calculated the distance travel by the robot in 1 rotation which came around 17.5 cm .

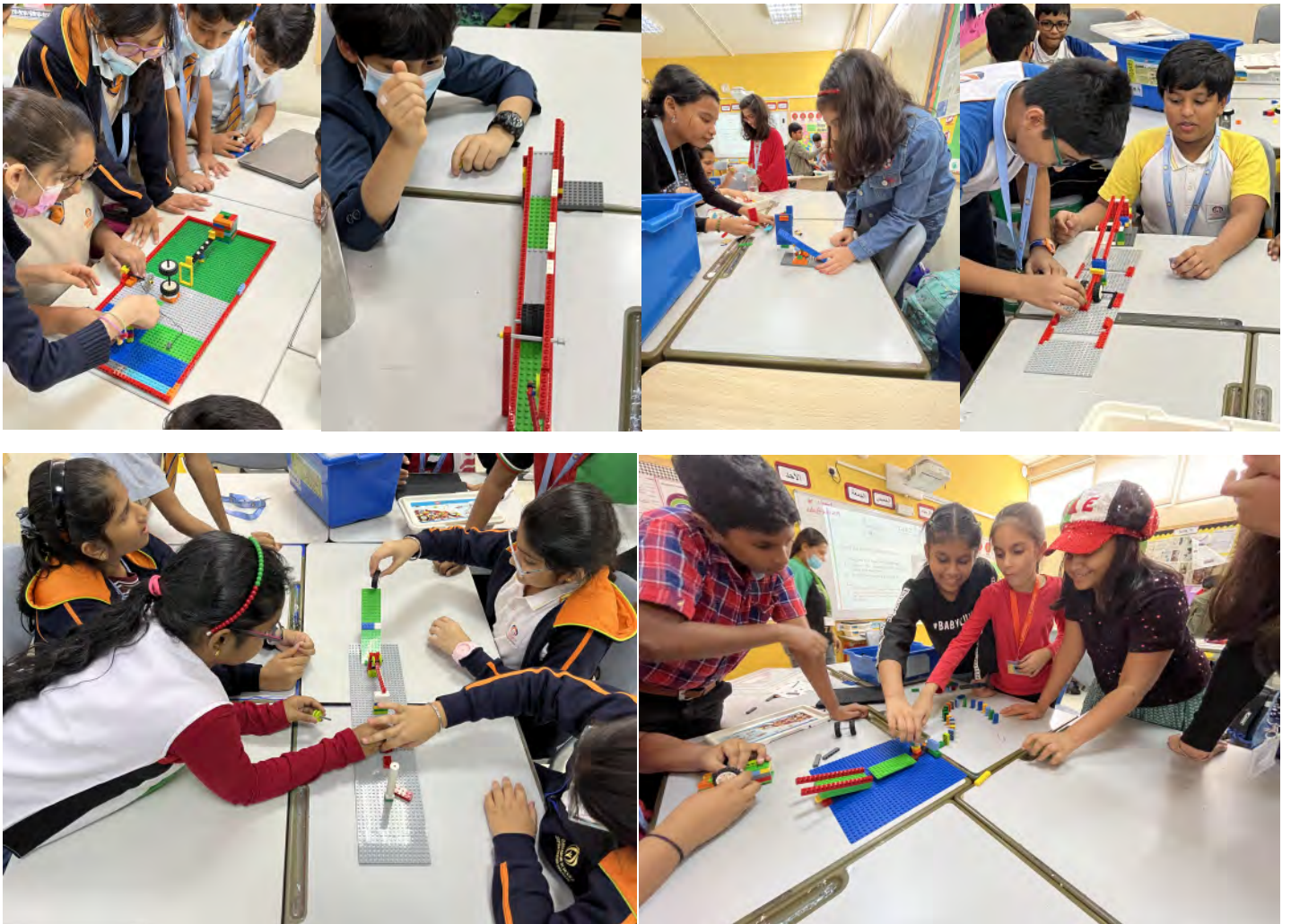
After the calculation for 1 rotation was done they were asked to find the number of rotation required to move the Robot 100 cm, which involved the division of decimals.

Students liked this activity as it not only give them idea to apply the concept of decimals in robotics but also clears their doubts of decimals and fractions .



## RUBE GOLDBERG MACHINE!

Students were asked to construct the Rube Goldberg machine using Lego Community Starter in this project. A Rube Goldberg machine is a sophisticated device created by connecting several simple machines. Teams used their innovation and imagination to learn how to use simple machinery in the real world. Following that, the building crews were instructed to verify the equipment owned by various teams. The best team for the activity was the group that had the most simple machines functioning together.



## FUTURISTIC CITY!

Due to the rapid change in technology and our way of life, we anticipate future solutions to our existing difficulties. In this project, students were urged to create a futuristic city that will address issues with contemporary cities, including traffic, pollution, sustainability, safety, etc.

Students used Lego Community Starter to plan and create their futuristic metropolis in teams. Students conducted research, identified issues in contemporary cities, and then attempted to provide solutions in their own cities. Teams were asked to present in front of the class after finishing the models and explain their thoughts.



## AIR BLOCK DRONE – LAND MODE

In this week's assignment the teams were tasked to test out several propeller configurations to determine if the hoverboard could travel forward, backward, left, right, or spin. Using the drone's propellers, the air block drone hoverboard can move across the ground. After building the hoverboard, teams used Bluetooth to link it to the program. They discovered the ideal configuration of propellers after testing it on the ground, allowing the hover board to travel both forward and backward.

Teams discussed their learning, modified their hoverboards, and then were given the challenge of competing in a hoverboard race!

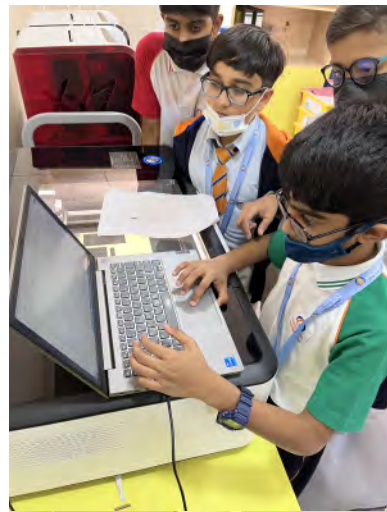
It was excitement all round when each team entered a race with its hoverboard, and the team with the best hoverboard won. The opportunity for students to operate an actual hoverboard and comprehend its workings made this activity very enjoyable for them.



## PROPULSION OF MAGLEV

Designing an innovative chassis for the pitsco maglev was the challenge given to the students. They designed their own chassis for the maglev train that can run on the horizontal track using the air block drone propellers that can fit on the maglev chassis.

Students laser cut their maglev chassis and then they try to fit the air block drone to propel the chassis in the forward and backward directions. After cutting the chassis, the teams figured out their mistakes and tried to improve their designs by cutting the chassis again.



## FOLLOW THE LIGHT -2

The week started off with the teams picking up where they left off, i.e the "Follow the Light" activity. The teams were challenged to make the robot move based on the path of light and slowly but surely students figured out how to operate the robot. Some programmed the robot to spin until it detected the light after which it followed the light and if robot missed the light it would start spinning again. While other teams programmed their robots to move only in the presence of light. At the end of the challenge, the various teams shared their learning with each other and found that operating a robot using the light was quite a demanding task.



## AIR BLOCK DRONE

Students learned about the new resource Air block drone, a programmable and controllable drone, in this lesson. Students were instructed to explore the drone flying regulations in the United Arab Emirates after learning about the various components of the drone. The virtual simulator was then made available to the research teams so they could try flying the drone and learn about its challenges. The lesson on drone flying was fun for the students.



## FOLLOW THE LINE

Follow the Line is an activity where the robot traces the line of a particular color and moves along with it.

In this activity, students were asked to connect the light sensor/ color sensor to the robot and detect the different colours using the sensors. They were challenged to code the robot to detect not only when to start and stop according to the colour but also to code the robot, follow the line and trace it.

Initially the robot didn't follow the line properly but after realizing their mistakes and working on them, the teams managed to move the robot in a straight line. Despite this, the robots would not turn along with the path, but the motivated students did not give up until the robot followed not only the straight line but the twists and turns it was asked to follow!





## AIR BLOCK DRONE

Students learned about the new resource Air block drone, a programmable and controllable drone, in this lesson. Students were instructed to explore the drone flying regulations in the United Arab Emirates after learning about the various components of the drone. The virtual simulator was then made available to the research teams so they could try flying the drone and learn about its challenges. The lesson on drone flying was fun for the students.

