

## Kindergarten

Students use Beebots during centers to practice language arts or math skills as well as learn beginning programming and robotics skills such as sequencing and problem-solving. Our friends “Maybee,” “2Bee” and others are bright yellow and black “bees” with wheels, blinking eyes and basic programming keys such as forward, back, turn right, turn left and go. Students use a grid mat with cards that correlate to the day’s lesson such as reading sight words, identifying or naming adjectives and proper nouns or telling time. Whether it’s getting to their card the fastest way or programming Beebot for a dizzying route, they are able to connect their programming to the curricular goals of the day. Students also use Bluebot, an enhanced Beebot that allows students to use an iPad or PC to program the robot remotely.



## First Grade

Students use Bluebot during centers to practice language arts or math skills as well as continue beginning programming and robotics. Bluebot is a “see-through” robot with wheels, blinking eyes and basic programming keys such as forward, back, turn right, turn left and go. Students use a grid mat with cards that correlate to the day’s lesson such as reading sight words, identifying or naming adjectives and proper nouns or telling time. Bluebot allows students to use an iPad or PC to program the robot remotely. Students also use Probot (Beebot & Bluebot’s big brother). Pro-Bot offers students an enticing, engaging, and hands-on experience with Logo programming as well as robotic controls. Pro-Bot commands are entered via a set of arrow and number keys mounted on the back or through a computer program. Students plan a route for Pro-Bot and press the corresponding keypad controls, press the GO button and send Pro-Bot on its way.

## Second Grade

Students in Second Grade begin to use more advanced programming skills. Using Lego Wedos, students build robots with motors, gears, sensors, pulleys and other engineering components. Students program their robots with laptops using the Wedo software, a drag and drop programming software, to move and make noise.



### Third Grade

Students continue to use Wedos to build robots, advancing skills and concepts learned in second grade. Students also use Lego Simple Motorized Mechanisms to build and explore machines and mechanisms, investigate motorized machines, calibrate and capture wind, and study gearing mechanisms. Students will use the engineering process to ask, imagine, plan, create and improve as they work with their mechanisms. Students will also use Microworlds EX, a computer based software and Sphero robots, iOS programmable robotic balls, to deepen their programming and robotic skills.

### Fourth Grade

Our 4th grade students learn through experiential, inquiry-based projects. There are four parts to each project. (1) Learning: students explore fundamental science concepts and gain knowledge to apply in the engineering process; (2) Doing: students think, brainstorm, and design to begin the engineering design process; (3) Making: students build, test, redesign, rebuild and retest their own designs; and (4) Writing: Students keep their own engineering notebook. In this notebook they will record observations, make predictions, record results of their plans, constructions and experiments. They will collect data, draw designs and reflect on their experiences. Through Junk Trunk Robotics, students use craft and recyclable materials to design and build their own robotic components. Students also use Cubelets Robotics.

### Fifth Grade

In the first third of the year, our 5th grade students will embark on a NASA-based adventure by programming and building a Mars Lander that will perform many scientific functions. In the second trimester, they will explore more advanced programming. In the third trimester, they will have a look at electronics and building electronic systems. They will use the four parts of inquiry-based learning. (1) Learning: students explore fundamental engineering concepts and gain knowledge to apply in the design process; (2) Doing: students think, brainstorm, and design according to required functions; (3) Making: students build, test, redesign, rebuild and retest robot designs; and (4) Writing: Students keep their own robots engineering notebook. In this notebook they will record observations, make predictions, record results of their plans, constructions and experiments. They will collect data, draw designs and reflect on their experiences. Students use Scratch software for programming and EV3 Lego Mindstorms for Robotics.