EXCEED ROBOTICS
the playground of the future

Junior Exceeders JR100
(ages 7&8)

Class	Lesson Topic	Lesson Description
1	**WeDo 2.0 Introduction**	Learn how scientists and engineers use robots to explore other planets, caves, oceans and volcanoes. Introduction to the Lego WeDo software and components to drive the science rover PROJECT: Milo the Science Rover
2	**Sensors and Collaboration**	Students learn why rovers need sensors to make decisions without human control and send messages back to home base. Motion and tilt sensors are used to make decisions and communicate back to base PROJECT: Milo the Science Rover to detect a plant using a motion sensor and send messages using a tilt sensor
3	**Forces and Friction**	Investigate the effects of balanced and unbalanced forces on the movement of an object. Understand how friction could affect pulling an object. PROJECT: Build and Program Pull-Robot and investigate pulling different objects on different surfaces
4	**Speed and Time**	Determine what factors make a car can go faster to help predict future motion. The effect of wheel size, motor power and pulley configuration will be quantified and investigated PROJECT: Build and Program a Race Car and investigate Speed versus Tire Size
5	**Robust Structures**	Discuss the causes of earthquakes, the Richter scale and the characteristics of a building that would help make it resistant to an earthquake. Learn how engineers use an earthquake simulator to evaluate a building's robustness PROJECT: Build and Program an Earthquake Simulator and Test Various Building Structures
6	**Frog's Metamorphosis**	Learn about the different stages of a frog's existence and its habitat. Model a frog's metamorphosis and identify the characteristics of the organism at each stage PROJECT: Build and program a moving tadpole, young frog and adult frog using sensors
7	**Pollinator and Flower**	Learn the relationship between and pollinator and flower during the reproduction phase. Build and program a model of a bee or other pollinator along with a flower that uses a motion sensor to detect when the bee is present. PROJECT: Bee Pollinator
8	**Prevent Flooding**	Learn about weather patterns and the use of floodgates to control water flow during low and high precipitation. PROJECT: Design and program an automatic floodgate with tilt and motion sensors to control water according to various precipitation patterns