



RICK HANSEN SECONDARY SCHOOL

2017 Polycultural Workshops Outline

Lesson 1 - Introduction to the Robot

	Senior	Junior
Activity 1: What is a Robot? 30 minutes	<ul style="list-style-type: none"> - What is a robot? - Robots vs Machines 	
Activity 2: Show and Tell 50 minutes	Setup multiple stations with different types of robots <ul style="list-style-type: none"> - Vex IQ Robots to show, students also get to drive the robot - LEGO MINDSTORM, FisherTechnik robots to show - Rube Goldberg Machine, Snap Circuit, and Model Car to show 	

Lesson 2 – Mechanisms & Simple Machines

	Senior	Junior
Activity 1: Types of Mechanisms 40 minutes	<ul style="list-style-type: none"> - Introduce Basic mechanisms and simple machines such as: Motors, Gears and Gear ratios, Sprockets, Levers, pulleys, wedges/incline planes, wheels and axles. - Demonstration Activities: Gear changing on bicycle, Torque Arm Challenge, Be a Ramp - Identify the simple machine matching game 	
Activity 2: Build Project 35 minutes	Build Lego Catapults based off pre-made demo Catapult, test for distance	Multiple types of mechanisms made out of LEGO kits (in groups) <ul style="list-style-type: none"> - They build the functional simple machines with pictures that mentors show from lego education resources.

Lesson 3 – Programming Workshop

	Senior	Junior
Activity 1: Introduction to Programming 35 minutes	<ul style="list-style-type: none"> - Explain the idea of breaking down into really small steps - Blindfold challenge for going around a maze - Introduce different types of sensors that are found on robots. 	
Activity 2: Different Types of Sensors 40 minutes	<ul style="list-style-type: none"> - Programming basic functions into Vex IQ or Vex drivebase, both autonomous and joystick control. - LEGO EV3 software with premade robots is also an option. 	Setup multiple stations with different types of robots/activities <ul style="list-style-type: none"> - Sensor Mashup station has LEGO MINDSTORM robots with lots of sensors - Coloured Foam blocks to be arranged in particular way with blindfold - Coloured Cups to be arranged in particular patterns on table

Lesson 4 – Arts Fun Day

	Senior	Junior
Activity 1: Icebreaker	<ul style="list-style-type: none"> - Icebreaker 	
Activity 2: Rotating Stations	<ul style="list-style-type: none"> - Bracelets, Necklaces - Bridges/Structures - Tshirt designs using brush robot - Tiedye Tshirts 	



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Lesson 5 – BattleBot Orientation Day (1st Build Day)/FisherTechnik Activity Day

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Activity 1: BattleBot Game Presentation/FisherTechnik Activity Introduction (15 minutes for both)	Introduce Battlebots Game, define rules, competition format, awards and build schedule <ul style="list-style-type: none"> - Show demo robots (if possible) 	Introduce FisherTechnik activity, show demo mechanisms (refer to Activity 1 in Lesson 2)
Activity 2: BattleBots Build Day (1)/FisherTechnik Activity	BattleBot build day, have a mechanism and strategy discussion (show inspiration videos) <ul style="list-style-type: none"> - Mechanism Discussion, Chassis Build, Mechanism Build 	FisherTechnik activity, refer to picture booklets to build simple machines

Lesson 6 – BattleBots 2nd Build Day/FisherTechnik Activity Continuation

	Senior	Junior
Activity 1: FisherTechnik Activity Continuation/BattleBots Build Day (2)	Continuation of Day 1 <ul style="list-style-type: none"> - Continue Mechanism Design - Chassis should be completed by the end of this session and driving 	Continuation from Day 1 <ul style="list-style-type: none"> - Finish up building the FisherTechnik models - cycle through simple machine stations, base designs off pictures supplied by mentors

Lesson 7 – BattleBots 3rd Build Day/Arts Fun Day

	Senior	Junior
Activity 1: Arts Fun Day/BattleBots Build Day (3)	Continuation of Day 2 <ul style="list-style-type: none"> - Chassis should be finalized and driving - Mechanism design should be completed and mechanism finalized and tested - Configure Bricks for competition day 	Arts Fun Day <ul style="list-style-type: none"> - Arts Activities TBD

Lesson 8 – BattleBot Competition Day/Catapult Building Day

	Senior	Junior
Activity 1: Lesson on Design Method and examples of failed designs (20 minutes)	-Defining design - Explaining the SPICE design process - Differences between engineer and designer	
Activity 2: BattleBots Competition Day (70 minutes)/Catapult Building Session	Competing with BattleBots Robot in predesigned format <ul style="list-style-type: none"> - Competing for Best Robot/Alliance and other awards 	Building Vex Catapults using simple machine concepts taught in earlier sessions <ul style="list-style-type: none"> - Competing for greatest distance travelled, and(?) other awards



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Lesson 9 – Presentation Day

	Senior	Junior
Activity 1: Presentations and Demos about BattleBot Designs/Catapult Designs to parents and organizers (90 minutes)	<ul style="list-style-type: none"> - Present overall designs to parents, with emphasis on simple machine concepts - Time given to prepare presentations with Mentors - Question period by parents and organizers, demos of all robots and catapults - Continuation of Fun Day Activities if time remains 	

Lesson 10 – Celebration Day

	Senior	Junior
Activity 1: Celebration/Open Day for all parents, students, mentors and organizers	<ul style="list-style-type: none"> - Recall day, talk about curriculum and recall basic concepts learned - Concluding presentation about continuing involvement in FIRST and how to join a team - Celebration Certificates given to students 	

***Keep in mind, the timings and lesson plans can vary slightly based on resources we have but engineering concepts that are taught will remain the same.**