

- Grades 4-6
- 100% female
- 8 Students
- 1 hr 30 mins long (with break in the middle)
- Tuesday, Wednesday, Thursday night from 6:30-8:00
- Classroom Hummingbird kit (\$845)
- Laptops (One per controller)

Goals--(What should the kids learn?)

- Learn about the Elements of Design and be able to connect the need of the user with the design of the robot
- Learn to embrace a growth mindset. Specifically, to learn from constructive criticism, learn from the mistakes and successes of others, and embrace challenges.
- Learn how their skills in STEM areas can translate to career opportunities.

- **Session 1**

Task	Time
Name Game	5 Mins
Explore existing robots, investigate how the robot interacts with people	15 Mins
Explanation of plugging in wires, drag and drop programming	5 Mins
Exploring LEDs and Tri-Color LEDs	10 Mins
Break	5 Mins
How to plug in and program sensors	15 Mins
If, then, else statements (have each person make up their own real-life if then statement)	10 Mins
Clean Up and discuss where sensors are used in real life and who might use them	10 Minutes

- **Session 2**

Task	Time
Explore STEM jobs by investigating who makes the types of things that	20 minutes

people use in their morning routine	
Game: students must line themselves up in order of birthday date without talking. Groups are assigned based on their order (first two are a group, etc.)	5 Minutes
Unpack robots, re-explore if, then statements with temperature sensors	20 minutes
Break	5 Minutes
Explanation/exploration of programming servos	15 Minutes
Identifying and exploring other types of sensors	15 Minutes
Clean Up and discuss engineering design process, mention final project	10 Minutes

○ **Session 3**

Task	Time
Human Knot to Re-Assign Groups	5 Minutes
Talk with partner to decide on a final project. Final project will be a culmination of all of the skills they have built. Robot must be useful in the real world, not just look cool or do something funny (not just a robot that has glowing eyes and waves). Maybe a robot that can take a person's temperature? Or for a challenge, one that can track a person as the person moves? Or one that tells time? One that backs up when a person gets close?	10 Minutes
Talk with group to refine idea for a final project; each group shares their ideas while others critique	10 Minutes
Talk with partner to come up with materials list for final project, share with teacher	5 Minutes
Work on final project. During this time, keep reminding students of how much time is left, walk around and help students troubleshoot.	30 Minutes
Share final project. Connect laptop screen to television so that kids can show their program. Ask students a series of questions while they're showing their robot. 1. What was your initial idea for your robot? 2. Can you show us what it does now? 3. What was the most difficult part, or what did you find challenging? 4. What makes your robot unique? 5. How would your robot be used in the real world? 6. Ask other kids if they have any questions or suggestions.	30 Minutes