

## Advanced Lesson 7, 8: Superhero Robots

Topics: *Integration (Community and SEL)*

In this integration project, children will draw on all of their advanced robotics and programming knowledge in order to create superhero KIBOs that use sensors and outputs to help people.

**This is a multi-lesson integration project.** This project is estimated to require two meetings. However, you can organize the individual meetings in whatever way makes sense for you and your class. A typical integration project might flow like this, spread out over multiple meetings:

- Circle time, readings, games and movement activities to introduce the project
- Small group time to imagine and plan
- Circle discussion to share plans
- Small group hands-on time to create
- Circle discussion to share challenges and successes
- Small group time to test and improve the creation
- Alternate circle meetings and small group work as needed*
- Final showcase to reflect on the process and share the projects

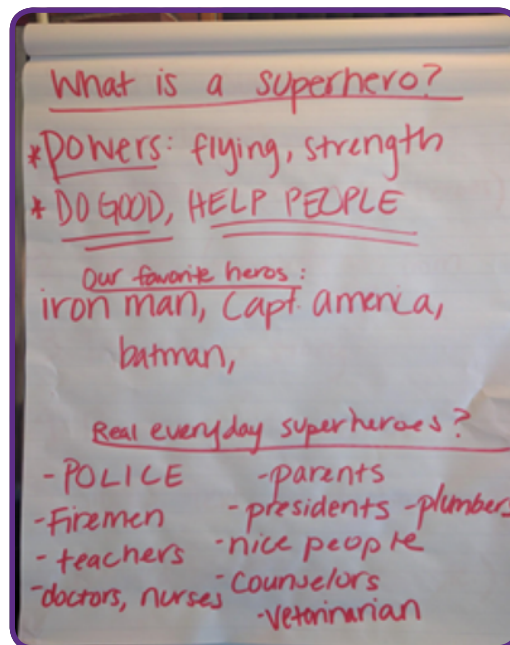


### Inspire: What is a Superhero?

The Superhero Robots project incorporates an exploration of programming and robotics (with a special emphasis on sensors) and integrates it with an investigation of superheroes from an interpersonal perspective by engaging children in discussions of leadership and decision-making.

“We’ve learned so much about KIBO! Can you believe we’ve learned about every part and every block that KIBO has? Now we’re going to put all of our robotics knowledge to work as we design Superhero KIBO robots! You will build and program robots that have special skills that they use to help people.”

Engage children in a brainstorming exercise: what are the characteristics that make a superhero? Brainstorm as a class and keep a running list on the chalkboard or on poster paper. Children may wish to start by listing popular superheroes from books, movies, and media. Teachers should prompt them to think about what makes these characters heroes and whether there are any “everyday” heroes who share these characteristics.



See the **TIPS FOR THE TEACHER** block for additional suggestions for this Inspire discussion.

This unit can be a wonderful way to involve parents and family members who have jobs of “everyday heroes” such as doctors, military officers, police officers, firemen, nurses, and more! Consider bringing them in to talk about how they help people each day in their jobs.



### Connect: Read *Everyday Super Hero*



Read *Everyday Super Hero* by Sara Zuboff: Sadie Sunshine wants to be a superhero, but she doesn't think she has what it takes. Sadie Sunshine will find out she has the right ingredients to be an everyday superhero.



### Engage: Create Superhero Robots

“Now that we have thought a lot about what it means to be a hero, it is time to create our own superhero KIBOs! Remember, KIBO has some super-senses (light, distance, sound) and some other parts that might be helpful too. You can create any kind of hero you want, as long as it is designed to help people in some way.”

Encourage students to be creative! Here are some project ideas to get students started:

- A super-hearing robot that comes to help when someone is in need. (HINT: try using the sound sensor.)
- A protecting robot that sets off an alarm when anyone comes near. (HINT: try using the distance sensor and sound blocks.)
- A KIBO version of a popular superhero such as Superman, Wonder Woman, Spiderman, Super Girl, etc. that is programmed to rescue someone. (HINT: this could be a great opportunity to add in a lot of arts, crafts, and decorating to get the look just right.)
- A KIBO firetruck, police car, or ambulance on its way to help in an emergency! (HINT: the lights, sound sensor, and sound recorder/playback might be helpful here.)

During the work periods for this project (as with all longer-term, integrated projects in the curriculum), students will alternate as needed between programming, building, decorating, and testing their robots. Provide lots of “loose parts” for building onto KIBO, including “structural” materials such as paper towel tubes, boxes, cardboard pieces, or the like; along with options for connecting these to the KIBO motorized platforms.

Check in with students frequently on an individual/group basis, and with whole-class Technology Circle meetings.



### Reflect: Superhero Showcase

Once the superhero robots are completed, it is time to share at a superhero showcase! Ask questions that allow children to reflect on their process and not just their final products. For example, “How did you get the robot to stop moving when you clapped?” or “Why did you decide to use these colors when decorating your robot?”

They should also be encouraged to thank any friends from the class who helped them when they encountered challenges. Remember, teamwork is an important part of engineering!

This showcase can easily be extended into an Open House that you invite parents, siblings, and more to attend, or community members who have “everyday hero” jobs such as police, fire fighters, social workers, healthcare workers, and others.

If you have the opportunity to collaborate with a drama teacher, you could even put on a skit or performance about superheroes, complete with student-designed super costumes!



### TIPS FOR THE TEACHER:

**What is a hero?** Children may begin by defining superheroes as people with powers or extraordinary skills (e.g. flying, invisibility, super strength, etc.) as they think of their favorite heroes like Superman, Wonder Woman, and Spiderman. You can remind children that many famous villains also have powers and extraordinary skills. What makes a superhero different is using their skills to help improve their communities and the world. There are many real-world people who do this every day in their jobs!

**The Engineering Design process.** Integrated activities highlight the importance of the engineering design process for children. Using the Engineering Design Journals (or notebooks of your own devising) makes the process concrete for students. If you like, you can also create stations or badges for each section of the design process. For example, you can have children tally how many times they tested their robot at the testing station.

**Mid-point technology circle ground rules.** At mid-point technology circles, invite children to share their in-progress work, and let them know that this is a time for questions and feedback. You may want to model for children what helpful feedback is, and lay some ground rules to avoid hurt feelings. Sample rules might include:

- If you say something you don't like about someone's project, also say something you do like.
- If someone is dealing with a problem that you also had, share how you solved it, or let them know you also have the problem and you can work together to solve it.
- Remember how you would feel if someone told you they don't like your creation that you worked hard on. Try to use words that wouldn't hurt a friend's feelings when you give your feedback.
- Use sentences that start with "I" (example: "I like...", "I notice...", etc.).