

Fearbots

Capstone Project on Mary Shelley's *Frankenstein*

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Specialized tools/technology used	Experience level required
Hummingbird Duo, Adafruit Robot Chassis, AA Battery packs for Arduino	None
Software: Arduino & Ardublocks for Hummingbird Duo	Competent using a computer for other school work; no other prior experience.

Grade Level (of this example): 8th

Time: 9 classes, 45-50 minutes each

Content Standards (of this example):

- **ELA** - creative writing, literary analysis
- **STEM** - robotics

Summary of Project:

During a unit on Shelley's *Frankenstein*, students were given this prompt: "Explore your own fears and create autonomous robots that demonstrate or represent those fears."

Students worked individually to design robots, build them, and then write a story about their monster. During robotics work periods, students helped each other answer questions and debug programs. As they worked, they entered a daily reflection, complete with writing and a photo, into a shared document. At the end of the project, they shared their work with their classmates.

Student Work





Notes from contributor

Before starting to design their robots, the students first saw some examples of things that robots can do, and were given a description of the project. They were asked to sketch a diagram of their idea on paper, and then fill out a survey where they were asked to describe their idea and name which parts they would need. The diagrams went into their personal daily reflection document.

Parts & supplies were ordered based on the responses to the survey. About two weeks later (after a class trip was completed and they'd read more of the book) they began the project. Reading of Frankenstein & daily questions about the text continued as homework.

9 classes, 45-50 minutes each. (1 introduction & idea generation, 5 classes with mini-lessons to learn the software and hardware, 3 work periods to build individual robots, 1 share out period)

Students own their own laptops but had no prior experience with Arduino nor robotics. Most had done some drag/drop programming via hour of code or Scratch. Only 2 out of 22 were proficient with robotics, having attended weekend robotics classes at MIT.

Most students did not create an abstract monster to represent their fear but concrete images: a mushroom cloud made out of cotton balls and lights to represent a fear of nuclear war; a diorama where they are a character in a situation that they dread, ie drowning, making a wrong decision, or feeling boxed in by peer pressure.

Suggested resources

- [Hummingbird duo website](#) has good examples and teacher help with wonderful tech support and fast response time. Their business is focused on students and teachers. Some limitations to be aware of:
 - Hummingbird Duos don't supply a chassis, so I used the [Adafruit round one](#) and it worked well. We installed Ardublocks using their instructions.
 - Sound wasn't available on the Hummingbird Duo - we used some small mp3 player bluetooth speakers instead, but they're not linked to the robot in any way and are not programmable. Alternatively, the Adafruit circuit playground has a small speaker built-in.
 - Hummingbird Duo doesn't supply push buttons or on/off switches

