

Surprise Box

Model Number: YE.312

Lesson Subjects: Summary of the semester, construction and programming competition between students, exploring the Distance Sensor as a promo for the next semester.

Accessories: Distance Sensors (one for each kit), small prizes.

Lesson Objectives:

- ❖ Students will experience a challenging construction and improvement competition.
- ❖ Students will express curiosity and a desire to continue attending "Robo Bricks" next semester.
- ❖ Students will explore, for the first time, the distance sensor.

Lesson Plan:

1. The instructor will get the students excited by giving them a quick, challenging construction and programming task.
2. Explain the model and how it works to the students.
3. Algorithm discussion.
4. Pseudo code discussion.
5. Construction and programming competition.
6. Exposing students to the Distance Sensor.
7. Promo for the second semester, which includes sensors.
8. Leading the students step-by-step through the programming screen, showing how to connect the Distance Sensor.
9. Improvements.

Surprise Box:

In this lesson, we will have a quick, challenging construction and programming competition.

The model that we are going to build is a surprise box.

Draw the following sketch on the board, in advance:

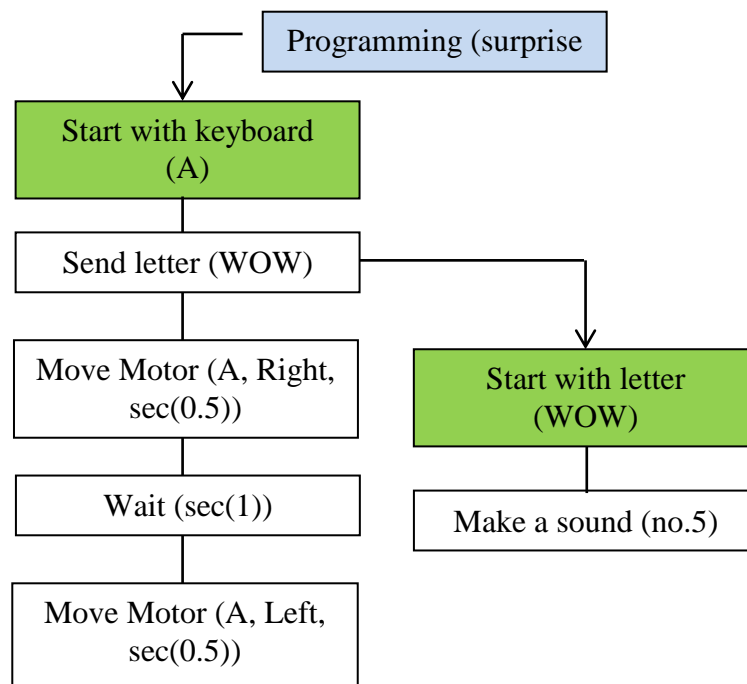


Explain to the students that this is a model used as a game: When the box closes, the clown is "hiding" inside, however when you open it up, the clown jumps out.

Algorithm Discussion:

1. Open the box.
 2. Take the clown out for a predefined period of time, and make a sound.
 3. Fold the clown back into the box.
- Note: For the improvements stage, the mechanism will also close the box.

Pseudo code:



Construction and Programming Competition:

Start the construction and programming competition. Note the following points:

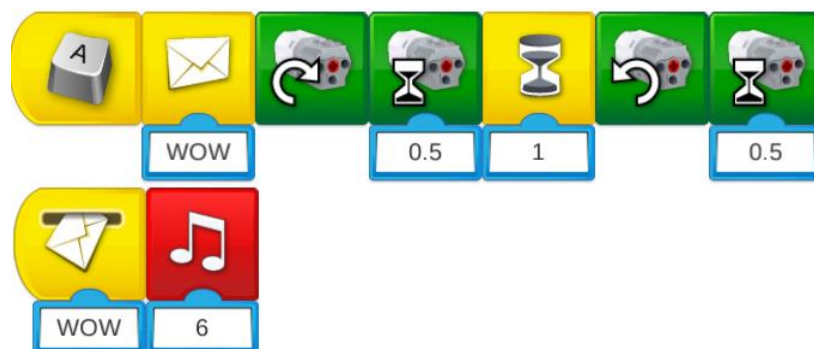
- You must set up a clear and reasonable timeframe for the competition, based on the number of children and how long the class is.
- Clarify to the students that construction does not include the improvements stage. Students who finish the construction before the improvements stage will show the model to the instructor.
- It's crucial, once the first two teams/students have finished up the construction, to tell the class to stop and hand out the distance sensors, to make it part of the challenge, thus ensuring that everyone is excited.
- Only present the distance sensor programming screen at the end of the competition.

Presenting the distance sensor and its programming integration:

- In this stage, the sensor and its location mode will be displayed. Show students the set of commands for programming the model in its new format (with the addition of the sensor). You should not get into discussions and explanations, but rather keep the students curious enough to want to continue next semester.

Program Screenshot:

No-sensor screen



Sensor-added, no sound screen



Instructor Comments:

- ✓ The entire lesson is meant to be a fun, competitive lesson, therefore it's important to provide positive feedback and to reward the students.
- ✓ You should focus on using a sensor, and getting the students excited about using it and other sensors in the next semester.

Improvements:

- The basic model ends up at step 7, the following steps are improvements.
- In step 3, please note that the 8 axle is not connected to the center of the gear, and the nail and axle should be placed exactly at the marked spot.
- In step 14 (improvement) the rubber band should be placed when the model is in a closed position.