MiddieMakers Activity Guide

Blue Bots & Programming

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<th>Middie Designer: Terri Kempthorne</th>
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<td>Topic or Unit of Study: Coding, Programming &amp; Robotics</td>
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Activity Description

Students will explore computer coding, and the simple programming of robots, utilizing Chromebooks, iPads, and Blue Bots.

Challenge Questions:

- Can you use the computer to program a character to complete a series of tasks?
- Can you program a robot to complete a series of required tasks?
**Activity Goals**

Students will gain a better understanding of simple coding and programming, and understand the exact sequencing necessary to program a robot to complete a series of tasks.

**Standards**

**ISTE 3d** - Students **build knowledge** by actively **exploring** real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

**ISTE 5d** - Students understand how **automation** works and use algorithmic thinking to develop a **sequence** of steps to create and test **automated** solutions.

**ISTE 6a** - Students choose the appropriate **platforms** and **tools** for meeting the desired objectives of their creation or communication.

**ISTE 7c** - Students **contribute constructively** to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

**Materials & Resources**

**Materials**
- Paper
- Writing materials (markers, pens/pencils, etc.)
- Chromebooks
- iPads (1 per group)
- Blue Bot (one per group)
- Blue Bot map pad (one per group)
- Random small obstacles (AND / OR)
- An assortment of cardboard & craft materials
- Scissors
- Tape

**Resources**
- [https://www.youtube.com/watch?v=1XxKHHdNFA4](https://www.youtube.com/watch?v=1XxKHHdNFA4) (from :16 to 1:54)
- [https://www.youtube.com/watch?v=4TjwUNzgU](https://www.youtube.com/watch?v=4TjwUNzgU) (all)
- [https://www.youtube.com/watch?v=GTahuDqWSs0](https://www.youtube.com/watch?v=GTahuDqWSs0) (up to 1:40)
- [https://www.youtube.com/watch?v=z2UJ76M_4](https://www.youtube.com/watch?v=z2UJ76M_4) (all)

**Setup**

Have paper and writing materials for each group of students. Each group will also need one iPad, one Blue Bot, and one Blue Bot map.
Have open, on the presentation computer, the following link:
https://www.madewithcode.com/projects/animation

**Implementation**

**Learning Context**

Ask the students if they can think of anything in their daily lives that they have to do in a particular order. (examples include getting dressed, making a sandwich, etc.) Have them talk through the particular steps necessary to complete the tasks.

**Procedure**

1. **Anticipatory Set:** Using, https://www.madewithcode.com/projects/animation, work as a class to design and program a dancing Yeti.
2. Reinforce with the students, as you are working through this process, how this aligns with the Design Process Cycle.
3. Also demonstrate that the Yeti *only does exactly* what it is programmed to do.
4. Have students go to their stations, and work as a group to program a Yeti to perform a series of at least eight separate actions. One action must be “entrance” and another one must be “exit”.
5. Allow the students to work for about 10 minutes in their groups, designing and programming.
6. Allow the students to gather around each table set to present and view the various solutions.
7. Follow this with the https://www.youtube.com/watch?v=1XxKHHdNFA4 video (shown from :16 to 1:54), and then the https://www.youtube.com/watch?v=4TjwU1N7gxU video.
8. **Direct Instruction:** Explain how to use the Blue Bots
   a. How to use the buttons to program it to do a command, but the like the Yeti they just completed, it will *only* do exactly what it has been programmed to do.
   b. Explain that the Blue Bot will stop and the eyes will flash after it completes *each* command.
   c. Explain that you cannot add commands into the middle of its programming, so it may be helpful to keep track of what commands they have given the Bot.
9. **Guided Practice:** Using a Blue Bot and a mat, choose a finishing point on the map, then have the students offer suggestions as to what the command sequence should be for the Bot to be able to reach the goal. Write their directions on a piece of paper or a whiteboard (however you want to represent their directions is fine: arrows, words, etc.)
10. Press enter and observe how their efforts worked.
11. **Check for Understanding:** Did it work? Does something need to change? If yes, what? (Reinforce that this is part of the Design Process Cycle).
12. **Independent Practice:** Have students go back to their groups to work on a problem/solution set for their own Blue Bots. This will take several days.
   a. Write the following guidelines on a whiteboard for reference:
      i. Bots must visit at least three separate and different locations.
      ii. Bots must make no fewer than five separate turns.
      iii. Bots must go through (or under) some sort of tunnel.
      iv. Bots must go around at least one stationary object.
b. Encourage students to work collaboratively as a group

c. Encourage students take detailed notes - (however they want to - written, drawing, etc.)
d. Ask open-ended questions as you observe the different groups working.
e. **Remember!!** There is no right way to complete this task.

13. **Closing:** On Friday, with about 40-45 minutes left in class, have each group present their creations to the group.
   a. Have each group clearly state with the goals are (which locations it is supposed to visit, where/what is the tunnel, and which object is it going around.
   b. Have classmates provide feedback.
   c. Ask: “What else do you think you could make your Blue Bot do, if given more time?”
   d. Ask: “How can you use this step-by-step thinking in what you do everyday?”

**Differentiated Instruction & Coaching Tips**

**Visual Learners** - Encourage the students to replay the videos, if needed. Also encourage them to draw a map of their ideas prior to programming their Blue Bot.

**Auditory Learners** - During presentation of the videos, read any on-screen text aloud to the class. Encourage students to talk through their ideas with their teammates.

**Kinesthetic Learners** - Encourage students to physically move around the room as needed to help them work out their ideas for which way the Bot will need to turn in order to achieve their desired results. Encourage students to program the Blue Bot utilizing the buttons on its back rather than the iPad app.

**ELS Students** - Encourage students to collaborate with their teammates to work out their ideas. Provide guidance and demonstrations only as needed.

**At-risk Students** - Encourage participation with the group. Encourage each student to come up with an idea for how to solve the proposed challenge.

**Advanced Learners** - Encourage students to design their own obstacles (such as ramps or tunnels) for their Blue Bot to navigate through. Encourage students to utilize the iPad app to program the Blue Bot, as opposed to using the touch buttons on its back. Or, present them with an additional challenge, such as the one in this video: [https://www.youtube.com/watch?v=GTAhuDqWSs0](https://www.youtube.com/watch?v=GTAhuDqWSs0).