

KID INVENTOR DAY: ROBOTS

Course Name: Technology/Makerspace **Time Frame (in minutes):** 2x 60 minute blocks

Unit/Theme: "Kid Inventor Day"

Grade Level: 2

CONTENT AND SKILLS
Learning Objectives: - Students will learn about robotics engineering and build a prototype of a robot that can do a job. - Students will learn to code with the Dash robots.
Essential Questions (optional):
Students I can statements . . . - I can act like a robotics engineer when I design and build a prototype of a robot on Book Creator. - I can use block coding to program Dash using the Blockly app. - I can work collaboratively with my group and use the Habits of Mind while participating in the Dash coding activity.
How will you meet the needs of SWD and ENL students? - Vocabulary will be clearly written in the presentation and explicitly introduced. - Students will receive support from a TA or SPED teacher, as stated on IEP or 504. - Students can draw their ideas on paper and take a photo of their work for the Book Creator project instead of working directly on the iPad.
Content Standards List all standards and how learners will meet the standard
- NYS ELA Grade 2 Standard 2SL5: Include digital media and/or visual displays in presentations to clarify or support ideas, thoughts, and feelings. 2SL6: Express thoughts, feelings, and ideas clearly, adapting language according to context.
NYS Computer Science and Digital Fluency Standards List all standards and how learners will meet the standard
2-3.IC.3: Discuss and explain how computing technology can be used in society and the world. 2-3.IC.7: Identify a diverse range of roles and skills in computer science. 2-3.DL.2 Communicate and work with others using digital tools to share knowledge and convey ideas. 2-3.CT.9: Identify and debug errors within an algorithm or program that includes sequencing or repetition.

NYS SEL BENCHMARKS -

<https://www.p12.nysed.gov/sss/documents/SEL Benchmarks2022.pdf>

- 2C.1b. Demonstrate adaptability in social contexts that consider community and personal well-being.
- 3C.1a. Identify ways they can help their classroom community.
- 3C.1b. Identify ways they can help their family.

INSTRUCTIONAL PLAN

List the steps of the lesson, including instructions for the students.

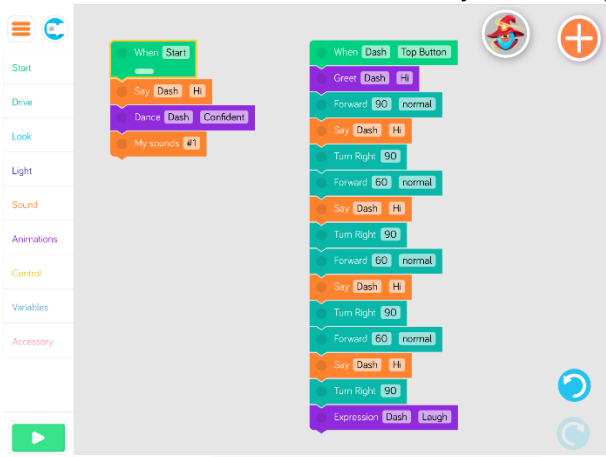
Lesson 1:

- Display PowerPoint presentation on the board for the class to see.
- Slide 1: Welcome students to the Hab Lab on Kid Inventor Day. Explain the goal: Today we will learn about robots and then YOU will invent a robot that does a job to help the community or our personal lives in some way.
- Slide 2: What is a robot? Explain with the graphic on the slide. Explain that robots are programmed by humans to perform a job. Humanoid vs. not- robots come in all different shapes and sizes! **2-3.IC.7**
- Slide 3: Job connection- Robotics Engineer- introduce it, have students repeat it back, then break down the job title. An engineer is a person who designs and builds complex products, machines, systems, or structures. Engineers want to know how and why things work. A robotics engineer builds robots! (Raise your hand if you think this sounds like a job you would like to have someday. If time, allow a few students to share why it sounds interesting.) Connect that today they will be acting as robotics engineers when they build a *prototype* of a robot. (Vocabulary- define, then have them practice saying prototype.) **2-3.IC.3**
- Slides 4-8: Ask, has anyone seen a robot before? (Real life, movies, etc.) Share examples. Then, show different examples of robots. Encourage them to notice how they all look different and do very different jobs- anything from teaching kids to code to driving on Mars!
- Slide 9: Introduce the Book Creator project. Explain they will use their iPads to log into Book Creator and join their class library. They will copy the template and design their robot on the page.
- Before students begin creating their robot, have them “Think, Pair, Share” ideas they have for robots that can be useful. SEL Connection: Consider how their robot can help the community, family, or the school when it’s doing a job. When students share their ideas, have them explain what the robot does (job) and who it helps.
- Once students are excited about their robot idea, they can log into Book Creator and begin creating. (approx. 20 minutes)
- After students have completed their robot, display the Book Creator library with the robot creations on the board for the class to see. Each student has a turn to display their robot and explain what it does. Connect it back to the SEL goal- how does it help the community, family or school? **2-3.DL.2**
- End the lesson by reflecting on the job of robotics engineering. Congratulate them for acting as robotics engineers when they designing a prototype of their very own robot! Explain that the next time they meet, they will learn how to use coding to program a robot to follow their instructions.
- *After the lesson, combine all student robot pages into one class book on Book

Creator. Publish the book and share the link with the class and select audience(s). (Remixable template and example linked.)

Lesson 2: Coding with Dash Robots

- Display the PowerPoint project on the board for the class to see (Slide 13)
- Class sits in a semi-circle around the front of the room. Place a Dash robot in the middle (that is already on and paired with your iPad.)
- Introduce the class to Dash. Let them know that Dash would like to say hi and introduce itself. Explain that they'll have to be nice and quiet and stay in their spots while Dash is moving.
- Teacher iPad- in the Wonder Blockly app- run this code (or something similar) to have Dash drive around the circle and say hi to everyone:



- After they say hi, explain how you were able to program Dash to do this using block coding.
- Slide 14: What is coding? Explain- introduce it as a vocabulary word. Show them the code on the iPad that you used to make Dash say hi to them. (Make sure students understand that Dash isn't "real", he's programmed to do those things, which makes him seem that way.)
- Slide 15: How does Dash work? Place a few Dash robots around the circle so students can see it close up. Start with "I Notice, I Wonder" about the parts of Dash they can see on the body of the robot, then point out the main parts of Dash that make it work.
- Slide 16: Dash Directions: make sure students understand how to safely handle the robot before they begin the activity.
- Slide 17: Materials- show them what each group will get and demonstrate how to pair the Dash robot to the Blockly app.
- Slide 18: Show them how to click on the "Puzzles" and begin following the directions to code. Explain: There will be times that you see a message that your code isn't working. Be sure to reread the directions carefully and try again. Coding is a very specific language and the robot only does exactly what you tell it to do. If the robot isn't doing what you want, you have to "identify and debug" the code. **2-3.CT.9**
- Allow time for students to ask questions.
- Slide 19: BEFORE breaking out into groups, ask the class to look at the Habits of Mind. Identify 3 Habits they think they will use when working with their group on the coding activity. Circle these Habits on the board. (Refer to them at the end when they're reflecting on the activity.) *Remind them about the coding error message- what

Habit will they use when their code doesn't work the first time?

- Divide class into 8 even groups and give each group a Dash robot and an iPad with the Blockly app open.
- Students work in small groups to complete as many Puzzle projects as they can within the allotted work time (approx. 30 minutes).
- Teacher(s) move around the room and support groups working as needed. Be sure to celebrate any time they persevere with identifying and debugging errors in their code. Point out examples you see of students applying the Habits of Mind, as well.
- Conclusion- Students turn off the Dash robots and iPads, return them to the table and sit in the semi-circle in the front of the room.
- Slide 19- revisit the Habits of Mind identified in the beginning of the lesson. Ask students to share the Habits they used and provide specific examples.
- Slide 20- Ask students to think about how they identified and debugged errors in their code while working with Dash robots.

BACKGROUND OR PRIOR KNOWLEDGE

- Students had prior experience with using Book Creator. This allowed them to focus on creating their robot without having to learn how to use the platform. This was their first time coding with the Dash robots, but they were familiar with coding from Scratch Jr.

MATERIALS / RESOURCES

Add additional resources needed for this lesson such as instructional technology templates, images, videos, etc.

- PowerPoint presentation: [Kid Inventor Day Robot- Lesson 2.pptx](#)
- Remixable Book Creator Template:
https://read.bookcreator.com/3PRMvBLIloWiZ05NKc-ELoWxosp9lWi-ItUllmso39g/twn2_Z0fR4C-wZfV-y3aTw
- Example of completed Book Creator class book:
<https://read.bookcreator.com/3PRMvBLIloWiZ05NKc-ELoWxosp9lWi-ItUllmso39g/hh2HTWs8Q6eDqmGJ6wZQKA>
- Optional Activity Extension: Discovery Education has a lot of videos and STEM Career connections for Robotics Engineering. Below is a screenshot of examples. These could be assigned through Discovery as an extension activity for students to complete independently, or shown to the whole group.

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03:26

Robotics Engineer
May gets to ask her questions to a Robotics Engineer, they build robots that get sent into space. Sid and hi...
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STEM Careers: Robotics Engineer
Learn about the career and take on a career-based challenge.
3-5 6-8 9-12

CAREER TOURS

STEP 1

STEP 2

Instructional Strategy Note Catcher | Amazon Career...
Download and print this worksheet to use with the Amazon Future Engineer Career Tours. Students...

Key Student Learnings Educator Guide | Robotics...
Get students engaged in discussion around robotics and STEM! Use these interactive questions and...
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40:54