"A Color of His Own" Dash Robot Coding Activity

Course Name: ELA/Technology
Unit/Theme: Reading, Block Coding

Time Frame (in minutes): 60
Grade Level: 2

CONTENT AND SKILLS
Learning Objectives: This activity integrates literature and coding. Students will use Dash the Robot to bring the story "A Color of His Own" by Leo Lionni to life by coding Dash to travel to different locations while changing its color lights, like the way the chameleon changed color as he moved to different objects in the story.
Essential Questions (optional): ●
Students I can statements . . . ● I can code the Dash Robot to drive to 4 papers and change the robot's lights to camouflage with the color of the paper. ● I can work interdependently with my partner to code the Dash robot using the Blockly app.
How will you meet the needs of SWD and ENL students? ● SWD will be supported by a teacher or TA while working with a partner during the independent portion of the activity. ● ENL students will use the Google Translate app to translate as needed. ● The difficulty of the coding challenge can be adjusted to the student's ability. Spacing the four papers equally distanced in a straight line allows for more simplistic coding, while placing the papers randomly on the floor requires the addition of turn code blocks and different distances.
Content Standards List all standards and how learners will meet the standard
NYS ELA Grade 2 Standards: ● 2R9: Make connections between self and text (texts and other people/ world). (RI&RL) ● 2SL2: Recount or describe key ideas or details of diverse texts and formats.
NYS Computer Science and Digital Fluency Standards List all standards and how learners will meet the standard
● 2-3 CT.9: Identify and debug errors within an algorithm or program that includes sequencing or repetition.   ○ Students will meet the standard when they are coding the Dash robot to drive to each piece of colored paper and change the lights to match the paper. Students will strive for accuracy when they adjust or debug the code to make

the robot drive the correct distances, turn the correct ways, and change to the correct colors.

- 2-3 NSD. 3: Describe and attempt troubleshooting steps to solve a simple technology problem.
  - Students will meet the standard when….

- 3A.1b. Create, understand, and practice shared classroom expectations that support the wellbeing of self and others.

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

- Introduction (10 minutes):
  - Activate prior knowledge by holding up the book, "A Color of His Own" by Leo Lionni. Ask students to think/pair/share about what happens to the chameleon in the story. (They're reading this book in ELA.)
  - Discuss how real chameleons change colors to blend in with their surroundings, which is called camouflage. (Write the word on the board.)
  - Explain that today they will use Dash the Robot to reenact some of the color-changing moments from the story by camouflaging it to match the lights to the colors of the papers.
  - Teacher demonstration with a Dash robot: pre-program a Dash robot to drive around the circle of students and say hello. Change the colored lights on the robot so students can see how the lights work. *Refer to the directions with the "Coding Challenge" on the top.
  - Ask students, "What Habits of Mind will you need to apply while working with a partner on this challenge?" (Display the Habits of Mind on the board. Circle the Habits as they say them.)
  - Prompt students to consider what habits they will use when their code isn't working and the Dash robot isn't responding the way they want to. Explain how they will need to attempt troubleshooting steps to solve a simple technology problem. (2-3 NSD.3)
  - Assign groups to 8 stations. (Have Dash, an iPad and colored papers, and directions ready at each station). Sit at the station, use eyes to look at the materials. Read the directions aloud as the students follow along with their copy of the directions at their stations and complete the steps at their stations.

- Setting Up Dash (10 minutes):
  - Turn Dash's power on. (Step 1 in student directions)

- ○ Open the Blockly App on the iPad and connect to Dash. (Step 2 in student directions)

- ● Coding Dash's Lights (15 minutes):
  - ○ Begin by explaining the basics of coding Dash's lights to change colors. Show them how to use the "Set LED Color" block and select different colors.
  - ○ Encourage students to experiment with changing the lights' colors on Dash to match the chameleon's color changes in the story. (Step 3 in student directions)
  - ○ Challenge students to choose colors that match the colors of paper they have.
- ● Coding Dash's Movement (15 minutes):
  - ○ Introduce the concept of coding Dash's movement to drive to a specific location on the floor. Demonstrate, then reinforce the concept of input/output.
  - ○ Show students how to use the "Drive for" block to make Dash move forward, backward, left, and right.
  - ○ Students try coding their robot to drive from one location to another. Adjust speed and distance. (Step 4 in student directions)
  - ○ Explain that they will need to adjust the speed and distance Dash travels so it stops on top of the piece of paper. This can be called "debugging" errors in the program's code. (2-3 CT.9)

- ● Coding Challenge:
  - ○ Read the directions for the coding challenge together as a class. Emphasize teamwork: work together to problem solve and code on the iPad. (Connect to Habits of Mind.)
  - ○ Groups begin working- Place the 4 pieces of color paper on the floor (group decides where the papers will go. They can make it easier or harder, depending on comfort level). Start Dash at one colored paper, then drive to each piece. Dash must change his colored lights to match the color on the paper when he gets to each location. (Step 5 in student directions)
  - ○ Teachers circulate around the groups and encourage troubleshooting and problem-solving as groups are working.

- ● Reflect and Discuss (10 minutes):
  - ○ After the reenactment, gather the students and discuss their experience using the Habits of Mind as a framework. Ask questions such as:
    -What Habits of Mind did you and your group use today?
    -What challenges did you encounter, and how did you overcome them? (Focus on debugging errors (2-3 CT.9) and troubleshooting (2-3 NSD.3).
    -How was Dash acting like the chameleon in the story? How was Dash different?
  - o Teacher- Summarize the key takeaways from the activity and encourage students to explore further with Dash and coding.

BACKGROUND OR PRIOR KNOWLEDGE

- ELA Curriculum connection- "Wit & Wisdom, Grade 2 Module 1: A Season of Change; Focusing Question Arc 4: How does the chameleon change?" Students have been immersed in the text, "A Color of His Own" by Leo Leoni for several weeks. This Dash robot activity is an extension of their learning.
- Students have used the Dash Robot by completing several levels of the Blockly Puzzles earlier in the year. They are familiar with the basics of coding with Dash, but this is the first time they've started a blank project.

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

- Dash Robot- 1 per group
- iPad- 1 per group
- Blockly App on each iPad
- A copy of the book "A Color of His Own" by Leo Lionni
- Colored paper set (red, green, yellow, and blue)
- A clear and flat floor surface
- Student directions- 1 set per group A Color of His Own Dash Robot Student Directions.docx

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