DashDot Lesson Plan Format

(an optional resource)

In the context of the *PPAT*® Assessment, this lesson plan format is a template provided for teacher candidates to use as they develop well-planned and structured lessons. This resource also can help a teacher candidate better understand and design meaningful daily lessons that will positively enhance instructional practice and student learning. It is intended for use in conjunction with Tasks 2, 3, and 4. You have the option of using your own lesson plan format.

Standards/Performance Indicators/Skills Identify the state and national standards, performance indicators, and skills addressed by the lesson.
2.AP.C.01 With guidance, independently and collaboratively create programs to accomplish tasks using a programming language, robot device, or unplugged activity that includes sequencing and repetition. Verb: create – Bloom's level: Create
Learning Objectives/Goals Describe the lesson's objectives and the learning outcomes that are appropriate for meeting curricular/classroom needs.
- Students will create their own mazes for Dash to go through, using the app, Blockly, to program the robot through it. - The students will use measurement, sequencing of events, and design thinking to create a maze and program Dash to move through.

Assessment (the type[s] of assessment used throughout the lesson)

Identify the assessment that occurred before, during, and after the lesson.

Before:

Pre-Test:

1. What is the robot called?

A. Dash-Dot
B. Dashy
C. Frank
D. Dash

2. How does the robot work?

A. With a remote control.
B. Through the app Blockly.
C. A button on the side of the robot.
D. It can only be controlled with a computer.

3. What can you create with the robot?

A. A maze.
B. A fort.
C. An obstacle course.
D. A driving course.

4. What does the coding do for the robot?

A. Tells the robot where to go.
B. Makes the robot move anywhere.
C. The robot only moves in a circle.
D. The robot only moves in a straight line.

5. What did you use measurement for during the activity?

A. Measure the length of the robot.
B. To measure the maze length for the robot.
C. Measure the obstacle course.
D. Measuring the driving course.

6. How many mazes can you create with dash?

A. 1
B. 2
C. 4
D. As many as you want.

7. What did you use to help measure and create the mazes for Dash-Dot?

A. Blocks
B. Tape
C. Boxes
D. Chairs

8. What happens when you finish coding the robot?

A. You have to hit the go button on the robot.
B. The robot will start moving without stopping.
C. The robot will go through the maze after hitting the start button on the app.
D. The robot will start making noises.

9. What was your favorite part of the activity?

A. Measuring the maze.
B. Seeing the robot move.
C. Watching the robot move through the maze.
D. Listening to the robot make noise.

10.

During: Observation of students while they are building the maze and programming the coding as a whole group.

After:

The robot fails to independently and collaboratively create programs to accomplish tasks	The robot demonstrates considerable knowledge about the tasks.	The robot demonstrates a better understanding of the tasks.	The robot demonstrates a thorough understanding of the tasks.
Diagrams and/or sketches are difficult to understand or are not used.	Diagrams and/or sketches are somewhat difficult to understand.	Diagrams and/or sketches are clear and easy to understand.	Diagrams and/or sketches are clear and greatly add to the reader's understanding of the procedure(s).
Student rarely listens and often "plays" with the manipulatives instead of using them as instructed.	Student sometimes listens and follows directions and uses manipulatives appropriately when reminded.	Student typically listens and follows directions and uses manipulatives as instructed most of the time.	Student always listens and follows directions and only uses manipulatives as instructed.
Student did not work effectively with others.	Student cooperated with others, but needed prompting to stay on-task.	Student was an engaged partner but had trouble listening to others and/or working cooperatively.	Student was an engaged partner, listening to suggestions of others and working cooperatively throughout lesson.

Pre-Test Questions:

1. What is the first thing you would do with Dash when you receive it?
    a. **Connect it to your device**
    b. Throw it on floor
    c. Drive it around
    d. Program Dash to talk
2. What happens when you program Dash to “Forward 75 normal”?
    a. Dash will drive forward 75 meters at a slow pace
    b. Dash will drive backward at 75 miles per hour
    c. Dash will drive forward 75 inches at a fast pace
    d. Dash will drive forward 75 centimeters at a medium pace
3.
    a.

4. What different programmable sound categories are available for Dash?
    a. Say
    b. Animal
    c. Transport
    d. Weird
    e. All of the above
5.
6. When using Dash, what is the maximum distance that can be programmed for Dash to travel in one line?
    a. 100 cm
    b. 100 inches
    c. 25 cm
    d. 25 inches
7. Why does Dash ?
    a.
8. What ideas justify that Dash ?
    a. The sphero mini was unable to move the object and the object stopped the sphero mini's momentum.
    b. The sphero mini moved the object easily.
    c.
    d.
9. What would Dash bot do if your line of code read:

    "When Start

    Say Hello

    Forward 50 normal

    Weird Dash Beep"

    a. Dash would say "Hello", move forward 50 cm, then make a "beep" sound
    b. Dash would move forward only
    c. Dash would say "beep", then move backward
    d. Dash would not say anything, but would move forward
10. Which line of code would have Dash aware of obstacles in front of the bot?
    a. When Dash Obstacle in Front
    b. When Dash Start
    c. Forward 50 Fast
    d. Backward 50 Slow
11. How could you determine that the Dash bot would turn 90 degrees to the right with one line of code?
    a. The line of code must be specific so it should read "Turn Right 90"
    b. The line of code just need to have the number so it should read "90"

c. The line of code must be backwards so it should read “Turn Left”
d. The line of code just needs to be told to turn and the degree to turn so it should read, “Turn 90”

Lesson Structure and Procedures

Describe the sequence of events of the lesson elements, including the before, during, and after of the lesson (i.e., the engagement/opening, the procedures used, the activities for guided practice, and the conclusion).

Determined to be a project-based learning unit. The project itself is the construction of the maze based on the coding imputed by the students. As a way for the lesson to be cross curricular, the use of measurement in centimeters opens an opportunity for a math lesson. Within that same lesson the students create a presentation over the project using DashDot. The presentation can be in the form of powerpoint, Google Slides, or a video.

Ask the students to design their maze using whiteboards or paper. Ask them to come up with their own constraints based on what they know about Dash, or give them constraints (walls must be 11+ inches wide, turns must be 45 or 90 degrees, and so forth).

Next, the students will build their mazes using blocks such as Keva Planks in the classroom. Students might have to iterate on their designs as they try programming Dash through the maze.

Using an iPad and a Dash, students will program Dash through the maze using sequences of Drive blocks. You might want to introduce event sensors such as “Obstacle in Front” so that students can use loops to make their programs more efficient.

Wrap up! Ask students about what they learned about designing mazes. Have students share their programs and show how they navigated Dash through the maze.

Instructional Strategies

Describe the teacher’s approach to achieving the learning objectives and meeting the students’ needs.

- Teacher will use explicit instruction to explain the different modes of Dash and the Blockly app.
- Teachers will use inquiry-based learning to give students a problem and for them to investigate different methods of creating a maze and coding through

Dash.

wonder workshop

How Dash & Dot Work

Dash

Drive - Dash can drive forward, backward, turn left (spin), and turn right (spin). There are two wheels beneath the left and right side of Dash's body. You can steer Dash by changing the speed and/or direction of either wheel.

Head Motion - Dash can look up (25 degrees), down (10 degrees), left (120 degrees), or right (120 degrees).

Lights - There are 12 LEDs in Dash's eye that can be turned on or off. In Dash's ears (E) and chest (C), there are RGB LEDs. In Dash's tail, there are 2 red LEDs.

Sounds - Includes a variety of pre-programmed sounds!

Microphone - Dash has 3 microphones, allowing Dash to hear claps and identify the direction of your voice.

Distance sensors - Dash has 2 distance sensors in front (F) and 1 in back (B), allowing Dash to detect obstacles in front and objects behind with infrared lights.

Learning Activities

Describe the opportunities provided for the students to develop the skills of the objective.

- In a whole group discussion, students will discuss ways to create a rough draft of a maze on the whiteboard and include constraints such as turns being a certain angle, loops, sensors, and walls being a certain width and length.
- In a whole group, students will use various objects to create a simple maze for Dash with 2 or more constraints.
- Students will use Dash and the Blockly app to create a code in order to guide Dash through the maze.

Resources and Materials

List the materials used to plan and deliver the lesson.
Dash Robot IPad Blockly app Whiteboard and markers Pool noodles, cardboard; paper; other materials to make various obstacles

Technology Describe the instructional and/or assistive technology that was incorporated into the lesson to enhance instruction and student learning.
Dash robot and the Blockly app on an iPad
Differentiation/Accommodations/Modifications/Increases in Rigor Describe the modifications made to meet the needs of all learners and to accommodate differences in students' learning, culture, language, etc.

Focus Student 1 uses increments of 50 cm during the building of the maze. To help with coding and the addition of mathematics.

Learning Activity: independently students will measure in 50 cm increments for building a maze.

Focus Student 2 can change the translation of the dash dot program to Spanish.

Learning Activity:If there are multiple EL students they can work in small groups to complete the maze and record the data in spanish.

Classroom Management

Identify the strategies used that are consistent with the learning objectives of the lesson and that also met student behavior needs to help keep the students on task and actively engaged.

Extensions

Describe the activities for early finishers that extended the students' understanding of and thinking about the learning objectives/goals by having them apply their new knowledge in a different way.

Follow-Up Activity to the Lesson Describe a quick activity for review or for building on the lesson that will deepen student understanding and interconnect concepts. (The activity may be incorporated in class the next day or throughout the unit.)
Additional Information Identify any area or lesson component that was not covered by this lesson plan format but that you feel is vital to include in a description of the lesson.