Dash Quest: Navigate and Score!

Objective:

- Introduce students to basic coding with the Dash robot.
- Encourage teamwork and strategic planning.
- Develop problem-solving and critical thinking skills through an engaging activity.

Standards:

- CSTA 1A-AP-08: Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.
- CSTA 1A-AP-10: Develop programs with sequences and simple loops to express ideas or address a problem.
- NGSS 3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

Materials Needed:

- Dash robots (at least 4)
- Dividers for outlining the arena (e.g., pool noodles taped to the floor or just tape)
- Paper with numbers on them representing points
- Tape for securing the paper to the floor

Setup:

1. Outline a square or rectangular arena on the floor using dividers or tape.
2. Tape paper with numbers (points) in a pattern or randomly within the arena.

Procedure:

1. **Introduction (5 minutes):**
    - Explain the objective of the activity and the basic controls of the Dash robot.
    - Discuss the importance of coding and teamwork in STEM.
2. **Arena Setup (10 minutes):**
    - Set up the arena with dividers and place the numbered papers on the floor.
    - Divide students into teams, ensuring each team has a Dash robot.
3. **Coding Practice (20 minutes):**

    - Allow each student 2 minutes to practice coding Dash to drive and familiarize themselves with its movements.
    - Rotate through the team members to ensure everyone has a chance to practice.
4. **Team Strategy Session (10 minutes):**
    - Let teams strategize their approach for the competition.
    - Emphasize the importance of teamwork and planning.
5. **Timed Rounds (20 minutes):**
    - Conduct the activity in tournament style with two sets of four robots at a time.
    - Each round lasts 2-3 minutes.
    - Teams score points by driving Dash over the numbered papers and stopping with at least two wheels on the paper. Optionally, Dash can perform a dance or make a sound.
6. **Practice and Rotation (10 minutes):**
    - While waiting, other teams can practice in a designated area to get familiar with Dash's movements.
    - Rotate team members so each student gets a chance to input code.
7. **Scoring and Feedback (10 minutes):**
    - Tally the scores and determine the top teams.
    - Provide feedback and discuss strategies and performance.

Guiding Questions:

- How did your team decide which path to take to maximize points?
- What challenges did you face while coding Dash to navigate the arena?
- How did teamwork and communication play a role in your strategy?
- What changes would you make to your approach if you did the activity again?

Conclusions:

- Students should understand the basics of coding with the Dash robot.
- Emphasize the importance of teamwork and strategic planning in problem-solving.
- Highlight how coding can be used to achieve specific goals and the value of iterative testing and improvement.