Unit 5: BeeBots Engineering Challenge

Content Area: **Technology**
Course(s): **Technology**
Time Period: **Marking Period 4**
Length: **Weeks**
Status: **Published**

Unit Overview

In this unit students will take skills learned in the first two programming units to explore different engineering challenges using the BeeBot.

Standards

TECH.8.1.2.A.1	Identify the basic features of a digital device and explain its purpose.
TECH.8.1.2.A.CS1	Understand and use technology systems.
TECH.8.1.2.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
TECH.8.2.2.C.1	Brainstorm ideas on how to solve a problem or build a product.
TECH.8.2.2.C.5	Describe how the parts of a common toy or tool interact and work as part of a system.
TECH.8.2.2.C.CS2	The application of engineering design.
TECH.8.2.2.D.CS1	Apply the design process.
TECH.8.2.2.E.1	List and demonstrate the steps to an everyday task.
TECH.8.2.2.E.2	Demonstrate an understanding of how a computer takes input through a series of written commands and then interprets and displays information as output.
TECH.8.2.2.E.3	Create algorithms (a sets of instructions) using a pre-defined set of commands (e.g., to move a student or a character through a maze).
TECH.8.2.2.E.4	Debug an algorithm (i.e., correct an error).
TECH.8.2.2.E.5	Use appropriate terms in conversation (e.g., basic vocabulary words: input, output, the operating system, debug, and algorithm).
TECH.8.2.2.E.CS1	Computational thinking and computer programming as tools used in design and engineering.

Essential Questions

- What is a robot?
- How can I use a robot to help me add, subtract and estimate?
- How can I make a robot move?
- How can an invention be improved?

Application of Knowledge: Students will know that...

- Engineers have an impact on the world they live in and their daily lives.
- It helps to plan a route before going on a journey
- Robots can be programmed to move in different ways to accomplish a task

Application of Skills: Students will be able to...

- Program a robot (BeeBot) using forward, back, left, right and go buttons to take a complex route from a starting point to an end point going around an obstacle
- Use methods to help accomplish the above task: visual projection, projecting a route with rulers, or acting out

Assessments

The teacher will informally assess students throughout the unit by observing their natural usage of the following skills:

- Perform The Task
- Watch the child's attempts and final solution to the task. The children draw their solution on a worksheet, after they solve the problem.

Suggested Activities

- Engineer of the Week: Each week, a new engineer will be briefly introduced to the class, highlighting their impact on their current world.
- Students will be taking on the leadership role and teaching their peers different routes for their BeeBots using the provided maps.
- Students can pick the challenge of having the Beebot go to the hive, to the flower, and around an obstacle.

Activities to Differentiate Instruction

- Students can program the BeeBot to go to the flower and then come back to the hive.
- Behavior modification reward system to encourage time on task so that work is completed
- Partner with a capable learner. Closely monitor partner work
- Periodically, review the student's maintenance of their folders and incomplete work
- Provide individualized checklists of the directions for a task in support of the thorough execution of directions.

- Proximal seating for all large group work

Enrichment Opportunities:

Advanced Programing Activity- Stage 1 www.code.org

Integrated/Cross-Disciplinary Instruction

- ELA: Letter recognition, letter recognition/sounds
- Math: Color and shape recogniztion

Resources

- Wood blocks
- Laminted Beehive
- BeeBot 1 for each 3 students