Unit 4: BeeBots Robotics With ELA and Math

Content Area: **Technology**
Course(s): **Technology**
Time Period: **Week 25**
Length: **7 Weeks**
Status: **Published**

Unit Overview

Building upon the previous unit, students will continue to work on special machines called robots that can be programmed to do different things. Students will be taking simple nursery rhymes and programing the BeeBot to "act out" their story. Students will also be using number lines to practice basic addition and subtraction skills. They will be partnered off with another group and quiz each other by programming their BeeBots to act out different addition and subtraction facts.

Standards

TECH.8.2.2.C	Design: The design process is a systematic approach to solving problems.
TECH.8.2.2.C.3	Explain why we need to make new products.
TECH.8.2.2.E	Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.
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

- How can I use technology to be productive?

Application of Knowledge: Students will know that...

- Engineers have an impact on the world they live in and their daily lives.
- special machines called robots can be programmed to do different things

- You can estimate the distance between 2 objects using the BeeBots

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

- Program the BeeBot to move forward, back, left, right, and go in different combination to accomplish specific tasks.
- Reset the previous BeeBot program by using the reset button

Assessments

- Formative observation assessment
    - Teacher will observe students as they work and also check worksheets from those activities that have them. Students will be given extra help as needed.

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.

Math:

- Draw a number line or use masking tape to create a number line on the table or floor
- Have Bee-Bot add two numbers
- Program Bee-Bot to go forward and then back (subtraction)
- Program Bee-Bot to go forward x units, 3 times (multiplication)
- Add the negative number line and talk about negative numbers
- Draw an xy axis and talk about ordered pairs, slope
- Ask children to sit on the floor. Let children program Bee-Bot to visit others (estimation)

ELA:

- Sequence a story – Give a Moose a Muffin
- Act out a story – Little Red Hen, The Three Pigs, Billy Goats Gruff

- BeeBot Free Play - students are shown what the 4 directional buttons do and can explore their use.
- BeeBot Estimation and Measurement - Using taped "courses" around the room, students estimate the number of BeeBot steps to get from the Start to the Finish. They then measure the actual number of steps needed.
- BeeBot Adding - using laminated number lines around the room, students "teach" their BeeBot to add
- BeeBot Subtracting - using laminated number lines around the room, students "teach" their BeeBot to subtract by by programming it to go forward the first number, then backwards the second number of steps, and seeing where the BeeBot ends up.
- BeetBot Letter Recognition - using block letters made from masking tape, students "teach" their BeeBot to recognize different letters. Each letter should be made from an whole multiple of BeeBot

steps. Letters can include letters like F, H, and R that need backtracking. Students should be taught the math technique of "acting out" where the move their BeeBot manually as they program their BeeBot.
- BeeBot Race - students program their BeeBot to go across a start line to a finish line and race their BeeBots across the course.

Activities to Differentiate Instruction

- 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 check lists of the directions for a task in support of the thorough execution of directions.
- Proximal seating for all large group work

Enrichment Opportunites:

- Advanced Programing Activity- Stage 1 www.code.org
- Students will use the BeeBot App on an iPad to further program the BeeBot
- Students will work with additional mats including Days Of The Week, Weather, and the World Map

Integrated/Cross-Disciplinary Instruction

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

Resources

- Laminated BeeBot number lines
- Masking tape
- BeeBots- 1 for every 3 students
- Fairy Tale Mats