

Beebots Introduction

Materials Needed:

- Beebot robot
- jumbo popsicle sticks with arrows
- counting chips with arrows (I put stickers on the back to help clarify)
- laminated hive and flower pictures
- Beebot mat (either purchased, or made on roll paper and laminated)

Grade Level:
Kindergarten

Helpful tip:
if the bee is “going crazy” pick up the beebot and press the “go” to make it pause its route

Overview:

1. The goal of this game is to have students learn the basics of coding with Beebots by laying out their sequence before programming it into the bot.
2. One student starts as the “challenge chooser”. They select the location of the beehive and the flower by placing the cards on any square
3. The “path programmer” then lays out sticks and turns to build the correct path for the bee to take. If students line the sticks and dots up so they are touching, the sticks should fill the path exactly
4. Typically, I have the students show me their path before I hand them their bee.
5. Then, the path programmer follows the steps they laid out.
6. When they are done programming, the challenge chooser moves the sticks and dots out of the way. Then, the path programmer sets the bee down and pushes the “go” button.
7. Once the challenge is complete, press the blue x to have the beebot forget the sequence
8. Next, they trade jobs and play again!

Beebots Themed Mats

Materials Needed:

- Beebot robot
- roll paper
- sharpie
- printed clipart
- corresponding word cards

Grade Level:
Kindergarten-2nd
Grade

Mats I have made:

- planets/space
- food
- animal
- sports
- spanish vocab
- CVC words
- sight words

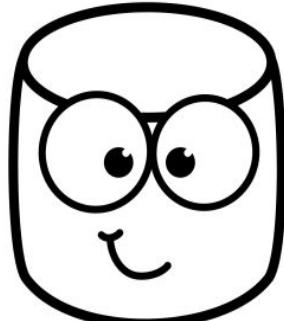
Overview:

1. I LOVE making beebot mats that match certain themes. I use roll paper to make my own mats by drawing a 15 cm x 15 cm grid. On the computer, I add fun clipart and text and print and glue these onto my mat. I also print out corresponding cards that have the words of the different spaces on them. Lastly, I cut them in half and run them through our large laminator for durability.
2. When students use these mats, one student is the “challenge chooser”. They put the beebot anywhere on the mat and then draw a card to indicate the ending space.
3. The other student is the “path programmer” and they push the buttons to get the bee from the start to the end
4. After the challenge is completed, students trade jobs.

Print and glue these on your Beebot mat



hot chocolate



marshmallow



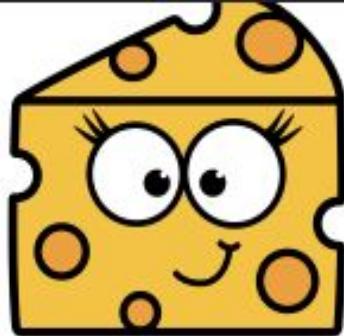
soda



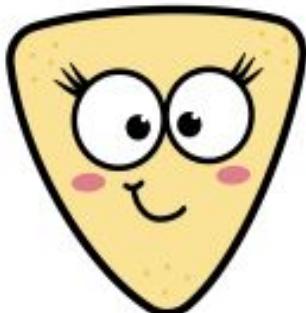
popcorn



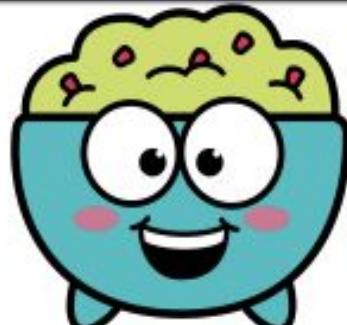
macaroni



cheese



chip



guacamole

Use these cards to choose which challenge to complete

burger & fries



cake & ice cream



carrots & peas



cereal & milk



macaroni & cheese



chips & guacamole



hot chocolate & marshmallows



soda & popcorn



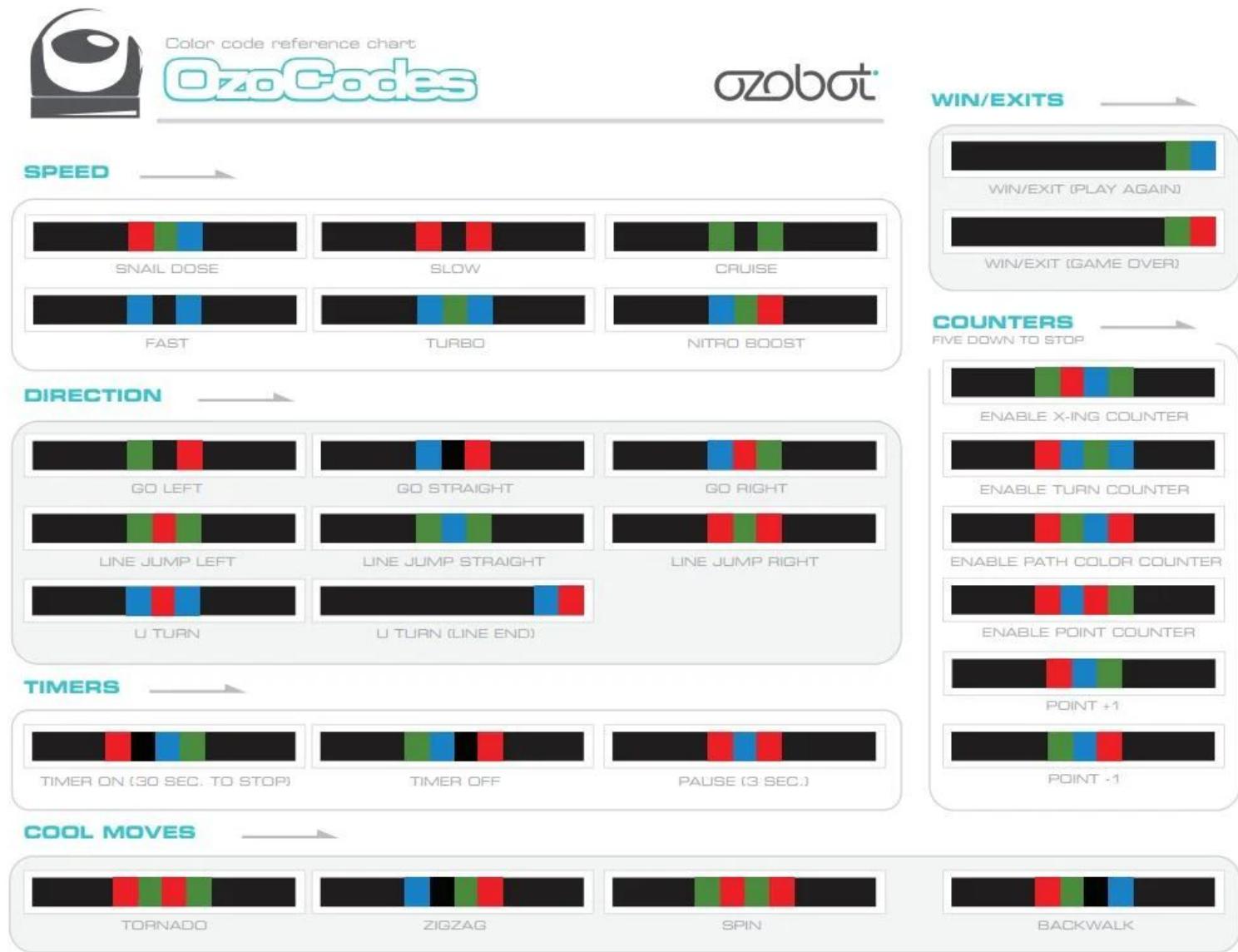
Ozobots Color Codes

Materials Needed:

- Ozobot robot
- black, blue, green, and red markers (Mr. Sketch and Sharpie flipchart markers are great!)
- grid paper
- address labels (print grid squares on them ahead of time)

Grade Level:
2nd-3rd Grade

Extend this activity by having students make a "robot city" out of empty containers for buildings that the bots can drive into



The chart is a comprehensive guide to Ozobot color codes, organized into several sections:

- Color code reference chart**: Shows the basic color sequence: Black, Red, Green, Blue, Black.
- ozobot**: The Ozobot logo.
- SPEED**:
 - SNAIL DOSE: Black, Red, Green, Blue, Black.
 - SLOW: Black, Red, Red, Black.
 - CRUISE: Black, Green, Green, Black.
 - FAST: Black, Blue, Blue, Black.
 - TURBO: Black, Blue, Green, Blue, Black.
 - NITRO BOOST: Black, Green, Red, Black.
- DIRECTION**:
 - GO LEFT: Green, Red, Black.
 - GO STRAIGHT: Blue, Red, Black.
 - GO RIGHT: Black, Red, Green, Black.
 - LINE JUMP LEFT: Green, Red, Green, Black.
 - LINE JUMP STRAIGHT: Blue, Green, Black.
 - LINE JUMP RIGHT: Black, Red, Red, Black.
 - U TURN: Blue, Red, Blue, Black.
 - U TURN (LINE END): Black, Black, Blue, Red, Black.
- TIMERS**:
 - TIMER ON (30 SEC. TO STOP): Black, Red, Blue, Green, Black.
 - TIMER OFF: Black, Green, Blue, Red, Black.
 - PAUSE (3 SEC.): Black, Red, Blue, Black.
- COOL MOVES**:
 - TORNADO: Red, Red, Green, Black.
 - ZIGZAG: Blue, Black, Green, Red, Black.
 - SPIN: Black, Green, Red, Red, Black.
 - BACKWALK: Black, Red, Green, Blue, Black.
- WIN/EXITS**:
 - WIN/EXIT (PLAY AGAIN): Black, Black, Green, Blue, Black.
 - WIN/EXIT (GAME OVER): Black, Black, Green, Red, Black.
- COUNTERS**:
 - ENABLE X-ING COUNTER: Black, Green, Red, Blue, Black.
 - ENABLE TURN COUNTER: Black, Red, Blue, Black.
 - ENABLE PATH COLOR COUNTER: Black, Green, Blue, Red, Black.
 - ENABLE POINT COUNTER: Black, Red, Blue, Green, Black.
 - POINT +1: Black, Red, Green, Blue, Black.
 - POINT -1: Black, Green, Blue, Red, Black.

COOL MOVES



ozobot



TORNADO



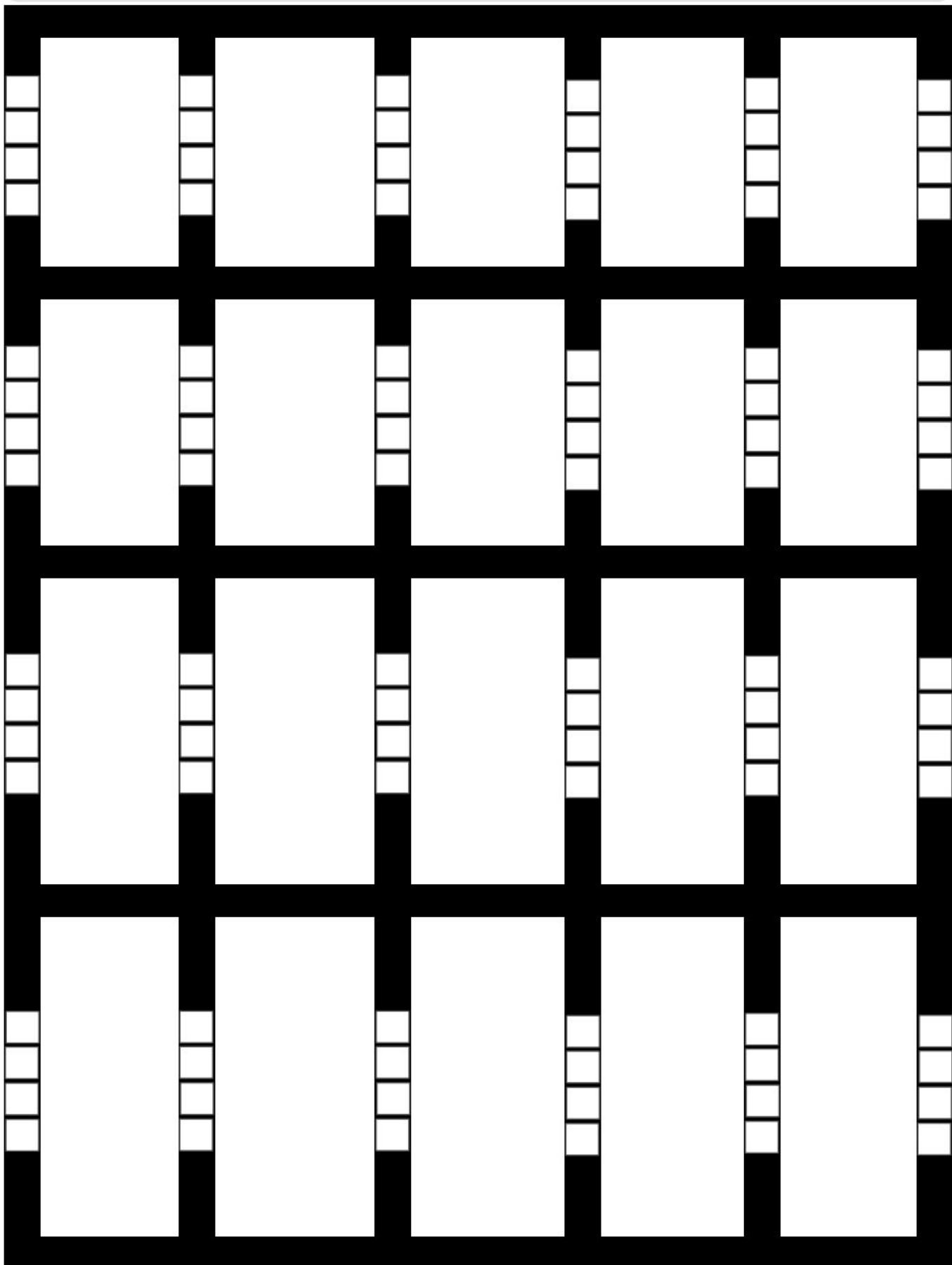
ZIGZAG



SPIN



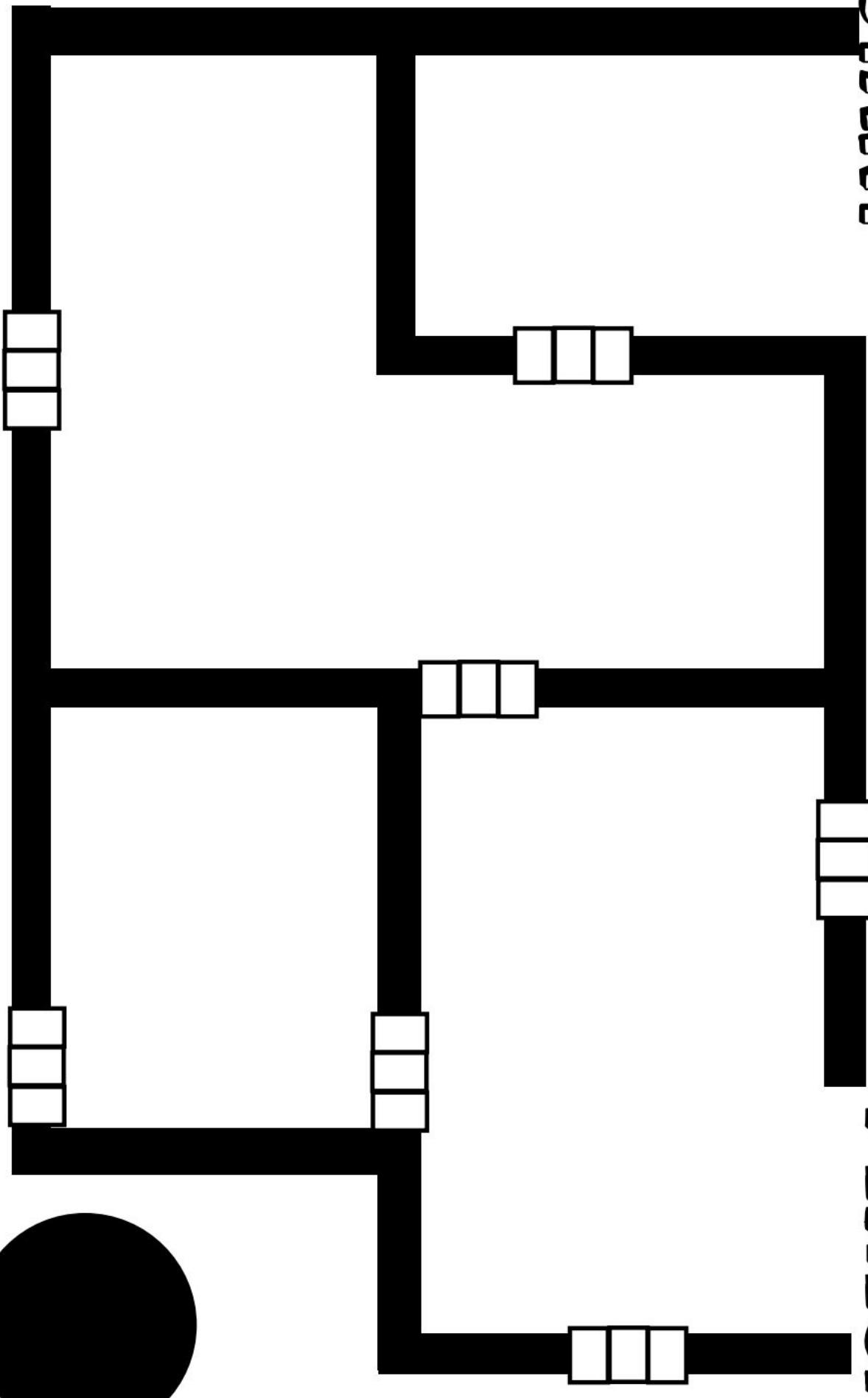
BACKWALK



START

FINISH

Calibration



LEGO WeDo Pets

Materials Needed:

- Lego WeDo set
- additional LEGO bricks
- ipads/tablet with WeDo 2.0 app

Grade Level:
1st-3rd Grade

Extend this unit by having students research animal habitats and make a shoebox habitat for their robot

Overview:

- I teach this unit after students have completed all of the basic classroom projects (other than the collaborating one).
- Students are challenged to design, build, and program a robotic pet that responds to them.
- Have students work together to determine what animal(s) their pet will be based on, which sensor (motion or tilt) they want to use, and what they want their program to do. Students should also decide if they want to use the other slot to plug in a motor to have their robot or something on it move.
- I like to allow my students to use regular LEGO bricks to make sure they have the colors they are hoping for.
- Examples my students have created include: a whale that you wave at and then it spins its tail and makes a bubble sound, a bird that spins its wing and squawks when you wave at it, and a unicorn that waits for you to tilt its horn and then it changes its light to different rainbow colors.

LEGO Spike Prime: Hopper

Materials Needed:

- Lego Spike Prime set
- ipads/tablet with Spike Prime app

Grade Level:
4th-5th Grade

***These kits can be used for the First LEGO League Robotics competition

Overview:

- This is one of LEGO's projects that I love to teach with my 4th grade students. Directions can be found in the app under "units" in the green Invention Squad section. It is the second set of directions called Hopper Race.
- This unit is great because after students follow the directions to build and program their Hopper robot, students are challenged to create different "legs" for their robot and can test and compare them. This leads to great iterative design practice and discussion about how the design of the legs impacts the way that the robot travels.

LEGO Spike Prime/Mindstorm Games

Materials Needed:

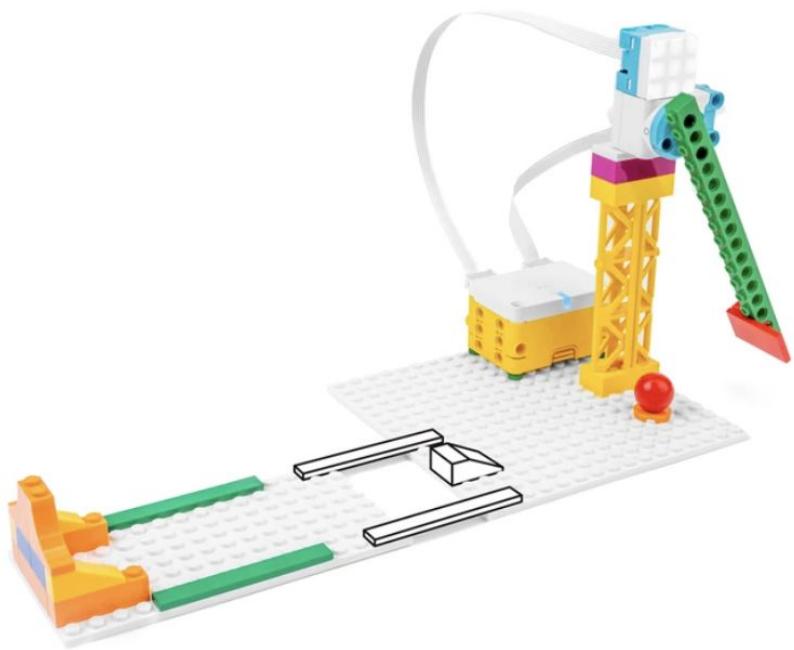
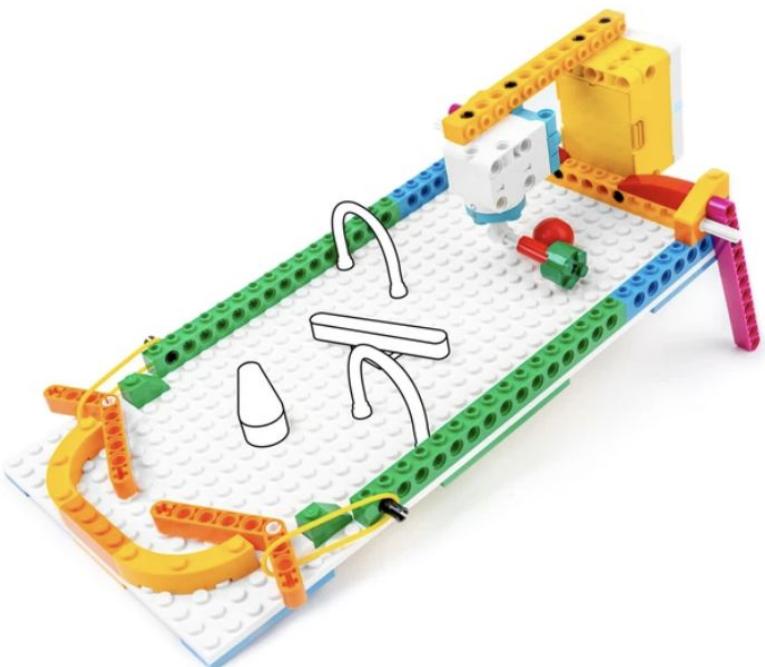
- Lego Spike Prime set or Mindstorm set
- ipads/tablet with Spike Prime app
- additional LEGO bricks

Grade Level:
4th-6th Grade

***These kits can be used for the First LEGO League Robotics competition

Overview:

- This LEGO project originated when I wanted my 5th grade students to have another opportunity to use our LEGO Mindstorm technic pieces. I had my students work in teams of 3 to create a game that can be played that is made out of LEGO bricks (both technic pieces from the robot kits and regular LEGO bricks).
- Projects have included a mini golf game with a windmill, a hockey game that is person vs programmed goalie, and a pinball style game.
- I gave my students a quick planning sheet, showed some idea pictures and let them get to work. Their creations were so fun and creative! There are some example pictures on the back to help you get started.
- You can also modify this challenge to have students make something that moves instead of limiting it to just a game. I would just say that it can't be a car/driving bot as that's often what the robot kits are used for.



Dash Robots Intro

Materials Needed:

- Dash Robot
- Blockly for Dash & Dot app

Grade Level: 3rd-5th Grade

These robots can be used with primary aged students if you get the Puzzlets board and compatible pieces!

Overview:

- The Wonder Workshop website has many great free ideas for activities and challenges for students to complete with the Dash robots.
- Idea prompts to give students:
 - have your robot drive in a perfect square
 - program a choreographed dance for your robot to do. Make sure to include at least 3 movement blocks, 2 loop/repeat blocks, and one additional type of block
 - make your robot blink the colors of a stoplight and then make a sound and drive forward on “go”

Sphero: coding challenges, maze makers, and costume dances

Materials Needed:

- Sphero robot
- Sphero app
- Sphero bowling pins (included with robot)

Optional Materials:

- magnatiles, Keva planks, or other building materials
- poster paper, colored printer paper, and other art supplies
- 3oz dixie cups and decorative art materials

Grade Level: 3rd-6th Grade

***if you aren't sure which robot is which, have students change the color of their robot's light

Overview:

- Students love to use the joystick to make their robot drive. It is difficult to determine the 'front' of the robot when using the Sphero Minis, so make sure you use the tail light to help orient the robot
- When using the joystick, I let students try to knock down the bowling pins or create a maze (either with building materials or out of paper) and then try and navigate through the maze.
- If you are wanting students to work on the coding aspect, I recommend having a checklist of challenges that they work on trying to complete as many as possible in a certain time frame and checking them off when they show an adult. My example checklist is included on the back :)
- Another great extension is to have students create a "costume" out of a 3oz dixie cup for their robot to wear. We had a programmed dance party to go with this challenge. the trickiest part for students is making sure that the costume is not so heavy that it impedes the robots' movement

Sphero Challenges

- Make your robot drive forward 1-2 feet
- Make your robot spin in 2 complete circles
- Have your robot drive forward, wait 1 second, turn, then drive forward again
- Use a repeat block and 2 movement blocks to have your robot move in a pattern.

Costumes

