

Using Ozobots to Simulate Agriculture Technology

Ozobots

How might Scratch programming help simulate farming technologies?

Ozobots (<https://ozobot.com/>) have several functions that help students to develop programming skills. Although this lesson is not meant to teach about all of those functions, students can use color codes (<https://files.ozobot.com/stem-education/Ozobot-Color-Codes-Chart.pdf>) using markers as well as Scratch programming language (<https://ozobot.com/create/ozoblockly>). Scratch programming is a beginning programming language that is freely available and can be used to program several robotic devices including ozobots.

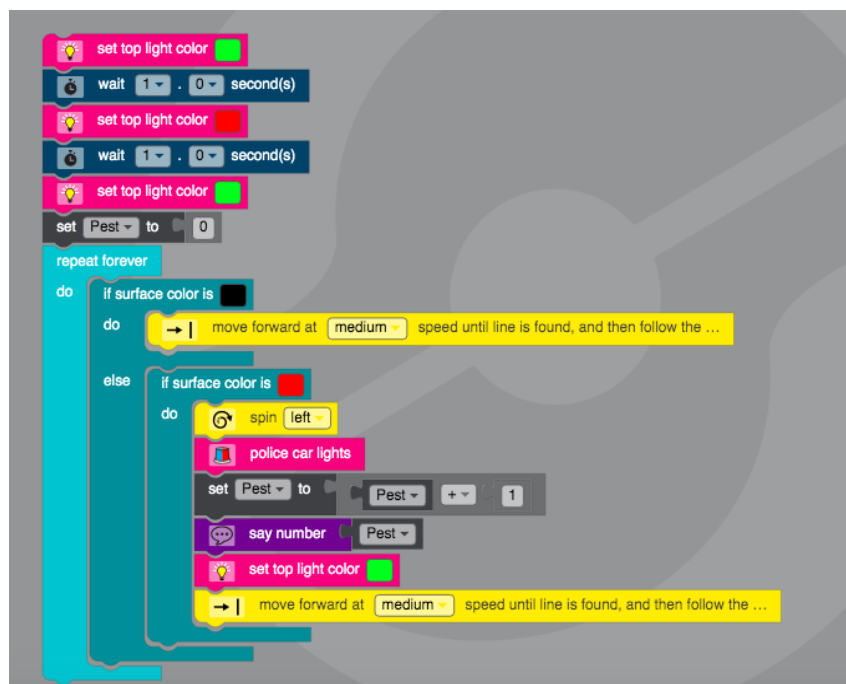
This activity is accompanied by a sample program and “map” of a field as an demonstration of one way ozobots may simulate a technological solution to an agricultural problem. However, the challenge of this unit is to develop another way programming and technology may be used to simulate the precision of the agricultural equipment being developed to solve additional problems.

Materials

ozobot evo
computer with WiFi access
printer
poster of model field from unit
scratch program for counting weeds

Procedure

1. Set up an ozoblockly account at (<https://ozobot.com/create/ozoblockly>)
2. Replicate the program found in the screenshot below by assembling the appropriate blocks of code in the same order on your account. Note: The skill level must be set to 5 to access all the components used in this program. Name and save the program.



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3. Be sure the ozobot is fully charged. Calibrate the evo by following the instructions found here: (<https://ozobot.com/support/calibration>).
4. Load the ozoblockly app onto a “smart” device (see this list for devices: <https://ozobot.com/blog/device-compatible-ozobot-recommended-devices>). Log in to your account on the device. The program will be available for your ozobot evo to download after pairing your device to the evo using bluetooth.
5. Test the program on the template provided. The template **must** be color printed and it is recommended to be printed on 11” x 17” paper. (The paper must be flat to allow the ozobot to read the path and patterns. It will have difficulty if the paper is folded or wrinkled.)
6. The bot should follow the black line until it reaches a burnt orange rectangle (representing a weed/pest), then it will turn in a circle, flash red and blue lights, then say “one,” increasing the count by one at each new rectangle.
7. Start the evo anywhere on the “field.” As the bot encounters each weed (orange block), it should count. At each new encounter, the number should increase by 1.

Reflection

1. How might this action simulate a potential solution to weeds, pests or damaged plant in a field? Watch these videos to see examples: <https://www.youtube.com/watch?v=4l5u24A1j7I> , <https://www.youtube.com/watch?v=XH-EFtTa6IU>
2. How might programming lead to developments in solving other problems in agriculture in the future?
3. What additional problems do farmers have that might be solved by robots or artificial intelligence?

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