Lesson 6: Fighting Climate Change with Drones

Course: UFO or UAV? The Big Wide World of Drones.

Grade Level: 6th to 8th Grade

Time Required: 60 Minutes

Overview & Purpose

In lesson 6, students will learn how drones are being used to fight climate change. They will explore how drones plant trees, are used to treat trees to keep them healthy, and how they can be used to predict the weather. Students will then have the opportunity to create a program using the drone that will simulate how drones are used to plant trees. They will program a drone to fly over a designated area to drop seeds and plant “trees”.

Objectives

- Identify how drones are used in climate change
- Explore why drones are important in climate change tracking
- Create a program in the NextWave STEM Drone Simulator that will simulate seed planting using the virtual drone.

Materials Needed

- Presentation (with videos)
- Lesson Plan
- Wifi connection
- Tablets or computers with access to the NextWave STEM Drone Simulator

Engage (15 Minutes) *Slide 2*

1. Ask students what they know about climate change.
    a. Ask the students what can be done to help reverse the effects of climate change?
    b. Ask students if they know ways in which drones can be used to help reverse climate change. *Slide 3*
    c. Discuss why drones are used to help combat climate change and what makes them more efficient. *Slide 3 and video on slide 4*
2. Explain to students that they will design a program to fly seeds to a designated area and drop the seeds by flipping. We will imagine the drone carries a bag of seeds on the top of the drone.

Explore: Making the Drop (15 Minutes)

3. Tell students they will be creating a program in the simulator which will navigate the drone to an area where it can drop seeds. The program will need to cause the drone to tip to one side so the “seeds” will spill to the ground.
4. Direct students to the Egypt map on the NWS Drone Simulator website. Explain that seeds should only be dropped in the green areas, where they are most likely to grow, outside of the starting point. *Slide 5*

5. Students are to make sure the drone lands back onto the team landing pad to complete the activity.

Elaborate: Comparing Programs (10 Minutes)

6. Bring students back together to compare programs. Ask students how they achieved the goal of dropping seeds in the fertile areas. What areas did they focus on?
7. Review the simple code on *Slide 6*. Ask students to reflect with their groups whether their code was similar or different. DId they include a return to the starting point?

Evaluate (5 Minutes)

8. Bring students back together to discuss.
9. Ask students guiding questions: Slide 7
    a. What commands did you use to get the “seeds” to spill out onto the ground?
    b. Was your drone successful in planting “seeds”?
    c. Do you think there is a better way to program the drone so it will spill more “seeds” onto the ground? If so, which commands would you use to make the program better?

Differentiation and Extension

For additional rigor / extension (or older grade levels), have students create an alternative program that will return to the starting point to be reloaded, and

repeat the seed-dropping process. What is the most efficient route to drop seeds in at least 4 fertile areas?

Resources

Using Drones to Predict the Future of Climate Change
https://www.youtube.com/watch?v=vRxFsGmevuI

Fighting Climate Change with Drones
https://www.youtube.com/watch?v=DuTQf77-OSI

How Drones are Helping to Plant Trees - A Cleaner Future
https://www.youtube.com/watch?v=EkNdrTZ7CG4