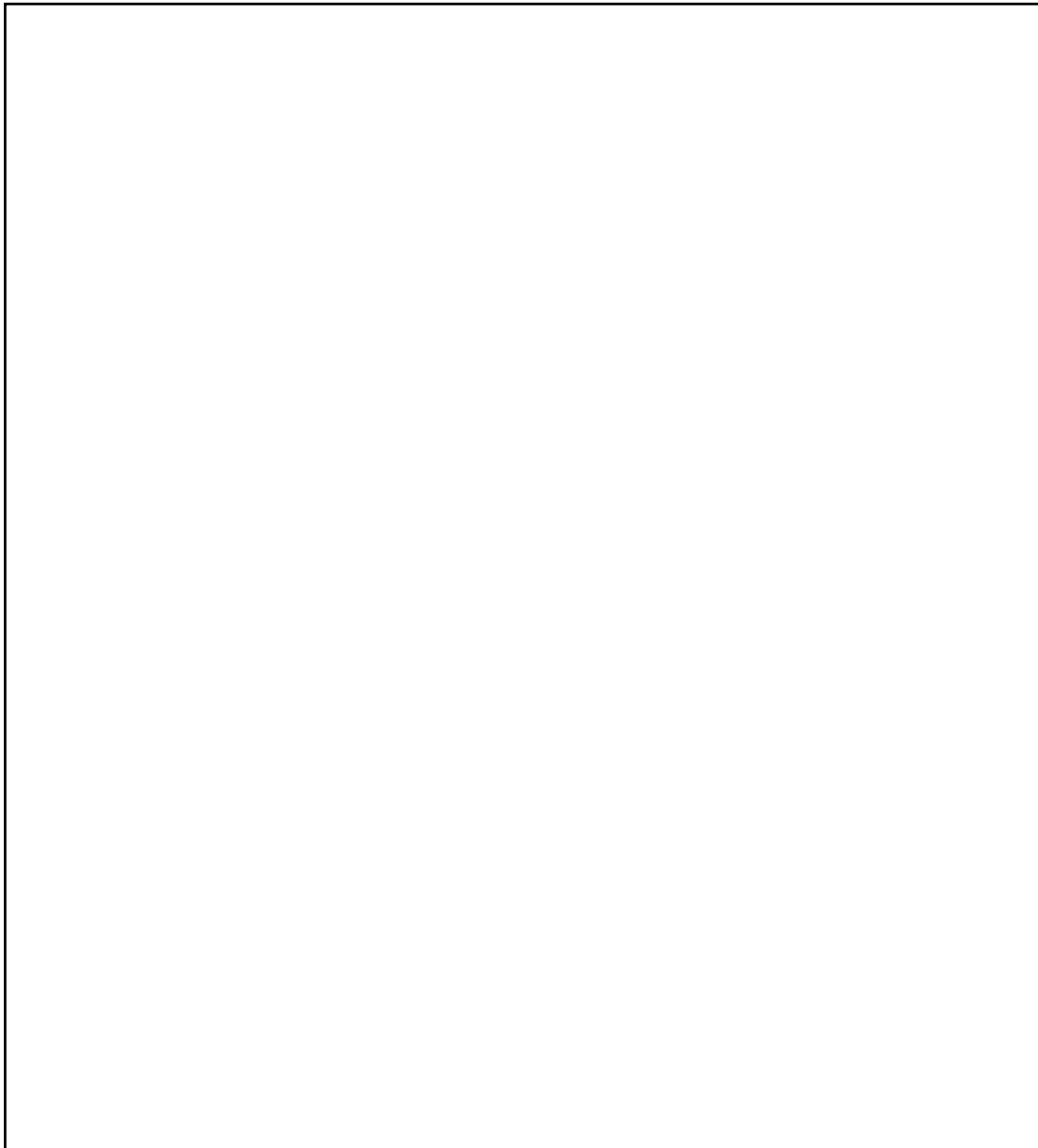


Drone Mission

Imagine that you are a farmer, and you are having a problem with your crops. Some of the plants are not growing well. Your fields are very large. You do not have time to walk through the entire area to check your plants. You're not sure what is causing the problem. You need more information before deciding what to do. Luckily, you have a drone.¹ You will need to program a flight plan for the drone and take aerial photographs of the problem areas. Examine the images captured by the drone's cameras to identify what is causing the problems, and determine how to manage your crops. Follow the instructions below to complete the mission.

1. Use the drone video footage captured by your teacher to map out the field's problem areas in the rectangle below. Assign a number 1-4 to each problem area on the map.



2. With your group, choose from the flight commands below to create a flight path that meets the following requirements:

- The drone may begin at any location along the perimeter of the flight path.
- The drone must take off and land at the same location.
- The drone's camera must face the farm field throughout the flight.
- The drone must fly around the entire perimeter of the field one time.

Flight Commands		
takeoff	land	fly forward <input type="checkbox"/> in
backward <input type="checkbox"/> in	fly left <input type="checkbox"/> in	fly right <input type="checkbox"/> in
fly up <input type="checkbox"/> in	fly down <input type="checkbox"/> in	yaw right <input type="checkbox"/> degrees
yaw left <input type="checkbox"/> degrees	hover <input type="checkbox"/> seconds	

Flight Path

3. Have your group's flight path checked by your teacher and make any necessary adjustments before programming the flight path in the DroneBlocks App.
4. Under the supervision of your teacher, test the flight path by launching your mission from the DroneBlocks App. Check the boxes in step 2 for each requirement that was successfully met during the test. Make any necessary adjustments to the flight path above, retest, and repeat until each box can be checked off.
5. With your group, take turns manually flying the drone over the field and take an aerial photo of each problem area. The first person will fly over and photograph problem area 1, the second person will fly over and photograph area 2, and so on.
6. Use the aerial photographs to identify what is causing each problem. Consult your Crop Troubleshooting Guide to find a solution for each problem area. Record the problems and solutions on the chart below.

Problem	Solution
1.	
2.	
3.	
4.	

¹Rose, S. (2017). *Agricultural Drones*. North Mankato, Minnesota: Capstone Press.