

Drone Conundrum

Grade Level: 3-8

Objective: Students will practice spatial reasoning and geometry skills by manipulating a model soybean field.

Common Core State Standards: CCSS.ELA-Literacy.RI.5.10
CCSS.Math.Content.5.NBT.B.5; 3.G.A.2

Next Generation Science Standards:
3-ESS3; 4-ESS3-1; 4-ESS2-2; 5-ESS3-1

Illinois Social Science Standards: SS.G.2.4

Suggested Reading: Materials:

Agricultural Drones by Simon Rose | ISBN: 1515737756

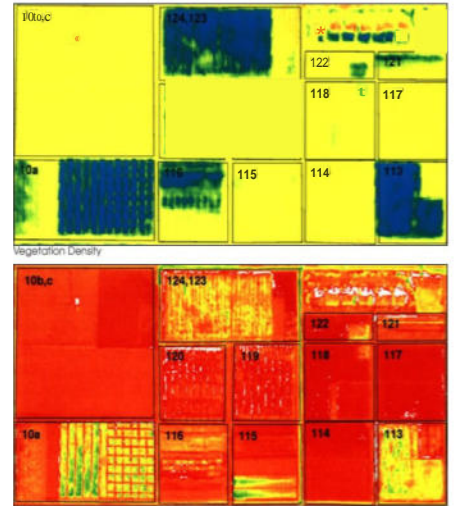


Image from NASA

Background: With the help of special cameras and unmanned aerial vehicles (UAVs), commonly called drones, farmers and scientists can see differences in the make-up of plots of land. From soil health to water drainage, technology is helping to identify and address a range of issues in agriculture.

What You Will Need:

- IAITC Soybean Ag Mag
- Handout on page 12
- Puzzle pieces on pages 13 and 14
- Scissors
- Glue stick (optional)

Directions:

Crops need nutrients from soil to grow. Nutrient levels can be calculated from images taken by drone. Planting soybeans is great for soil health. Soybeans provide an important nutrient, nitrogen, back into the soil.

1. Read about “Technology and Drones” in the IAITC Soybean Ag Mag.
2. Pass out a red soybean plot and green and yellow puzzle pieces from pages 12-14.
3. Cut out the puzzle pieces.
4. Compare the colors to the image in the Ag Mag, identifying the different levels of soil health.
5. Manipulate the pieces on the soybean plot to have the most green and the least red spaces possible. No pieces can fall outside the boundary of the soybean plot. Each plot may look different.
6. When complete, glue the pieces to the plot to display your field.

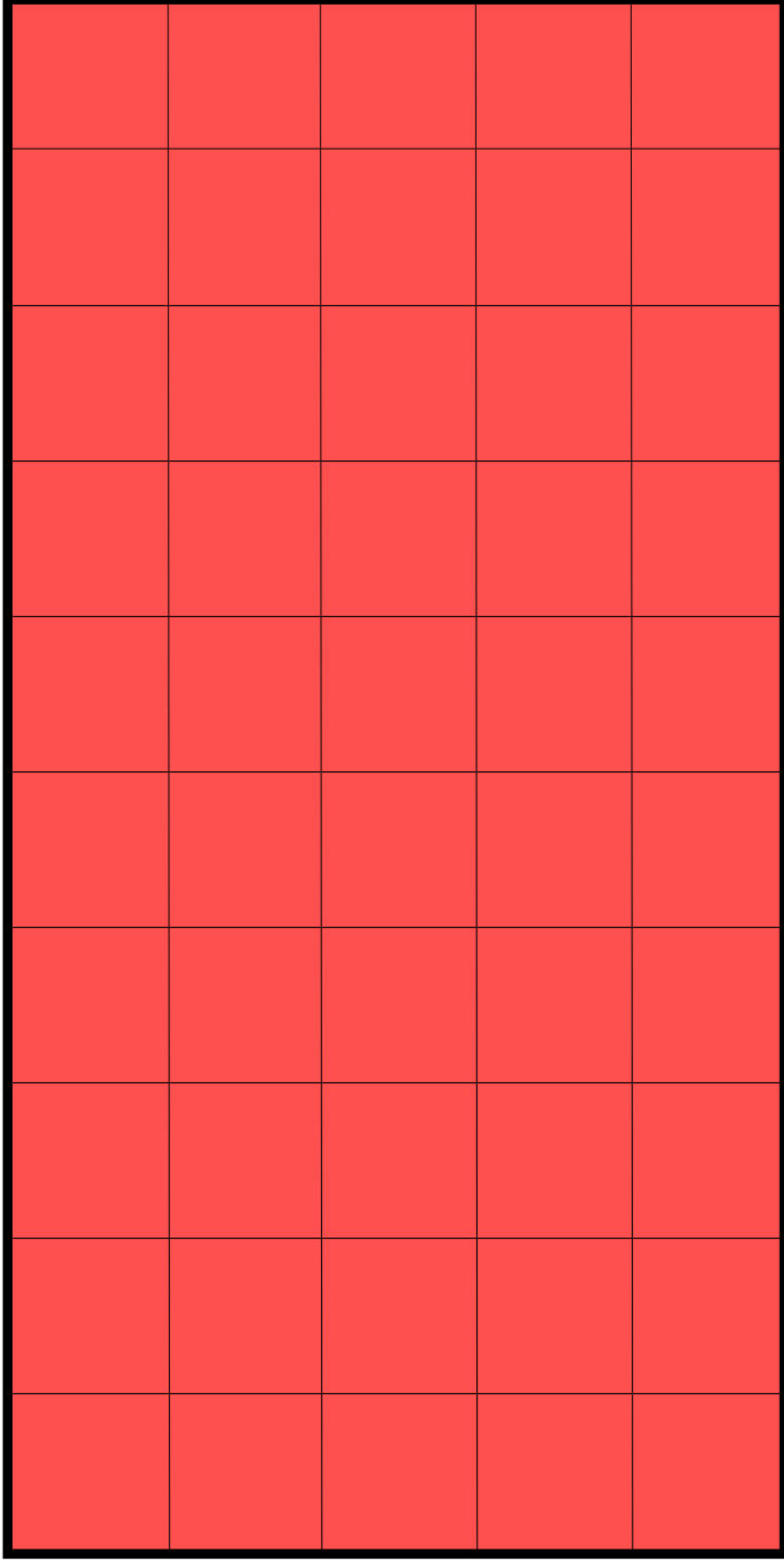
Lesson Extender:

Farmers apply nutrients to soil when necessary, but first they need to figure out where the soil is in need. It can be costly, so farmers do not want to apply more than necessary for a healthy crop. In 2017, the average cost of applying nitrogen was approximately \$40/acre.

1. Imagine each square of your plot is one acre.
2. With your current plot, how much would it cost to apply \$40 worth of nitrogen fertilizer to every red acre, and \$20 worth to every yellow acre in your drone image?
3. What is the lowest cost plot you can create with the provided puzzle pieces?

Answers will vary. The plot is 50 acres². The cost of an entirely red plot is \$2,000, and an entirely yellow plot is \$1,000.

Soybean Field



This is an aerial view of your soybean field taken by a drone with a special camera.

The color indicates the crop health.

 = Poor health

 = Somewhat healthy

 = Healthy

