

**Intended Audience:**

**Grade: 3-8**

**Learning Standards**

Empowered Learner

Digital Citizen

Knowledge Constructor

Computational Thinker

Creative Communicator

Global Collaborator

**Lesson Objectives**

Learn how AI-powered drones and robots are revolutionizing crop monitoring and harvesting in modern agriculture.

**Time Needed**

60 -90 minutes

**Equipment and Supplies**

Student worksheets

Large sheets of paper (at least 2ft x 2ft)

Colored markers

Small stickers

Measuring tape or ruler

Tape

Hole punch

4 pieces of string per group (6-8 inches long)

Tissue paper or thin cloth

Small light objects

Flashlights

Large trifold board or cardboard

**AI in Agriculture: Crop Monitoring and Harvesting**

**Background**

It is very hard to pick some crops, especially fruits and vegetables. The farmer has to be very careful to only pick the ripe fruit, and they have to be careful that they don’t bruise the fruit, or miss fruit that is ripe. This slows down harvest and there is often loss. Even though the people who harvest are well paid, it is very hard to find people to do the work because it is so hard.

**What to Do**

Part 1: AI-Powered Crop Monitoring (25 minutes)

**Activity: Drone Simulation**

Divide the class into small groups with 3-4 people in each group.

Provide each group with a large sheet of paper representing a field, colored markers, and small stickers.

Have students draw various "crops" on their field using different colors.

Secretly mark some areas with small stickers to represent crop issues (pests (insects), diseases, water stress, nutrient deficiencies).

One student from each group acts as the "drone," hovering over the field and reporting observations to their team.

The team must use this information to identify problem areas and suggest solutions.

**Discussion:**

How did the "drone" help identify issues?

What challenges did you face in monitoring the entire field?

How might real AI-powered drones improve this process?

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Part 2: AI in Crop Harvesting (20 minutes)

**Video Viewing and Analysis**

Show the video: [Autonomous Harvesting Robot](https://youtu.be/uD4mJCgsmdM?si=Xcwy1QZSLojSQXvL)

As students watch, ask them to note:

What tasks is the robot performing?

How does the robot navigate the field?

What advantages might this technology offer over traditional harvesting methods?

**Group Discussion:**

What impressed you most about the harvesting robot?

How do you think AI helps the robot make decisions about which fruits to pick?

What challenges might farmers face when implementing this technology?

How might AI change farming in the future?

**lesson: Facilitator notes:**

**Career Connection**

## AI and Data Careers

* **Agricultural Data Processor**
* **Analyze drone and sensor-collected data**
* **Create insights for farm management**
* **Develop predictive agricultural models**
* **AI Agriculture Specialist**
* **Develop AI solutions for farming**
* **Create machine learning algorithms**
* **Design precision farming technologies**

## Emerging Technology Roles

* **Autonomous Tractor Operator**
* **Remotely manage autonomous farming equipment**
* **Monitor multiple tractors simultaneously**
* **Use simulation software for farm management**
* **Agricultural Technology Researcher**
* **Develop AI solutions for crop management**
* **Research sustainable farming technologies**
* **Create innovative agricultural systems**

## Educational Pathways

* **Agricultural Technology Certifications**
* **Data Science Programs**
* **Drone Technology Courses**
* **AI and Machine L**