

## Agricultural Drones Discussion Guide Answer Key

### Chapter 2: Eyes in the Sky

1. How are agricultural drones similar to other drones?

They are equipped with cameras, sensors, and navigation systems.

2. How are agricultural drones different from other drones?

They are usually smaller, carry less equipment, and do not spend as much time in the air.

3. How are drones used by crop farmers?

To survey fields and sections of crops.

4. How are drones used by livestock farmers?

To monitor the health of animals and track their movements.

5. What are the advantages of using drones on farms?

Drones can save time and expenses by checking a farmer's property more efficiently, track animal movements, check crops for signs of disease and pests, gather information on the number of plants and their heights, show growing conditions, and spray herbicides or pesticides.

6. What are the benefits of gathering images from a drone's camera instead of a satellite?

A drone's camera takes high-resolution images that have clear detail, are less expensive than satellite images, and are not affected by cloud cover.

7. Who sets the rules for drone use in the United States?

The Federal Aviation Administration (FAA)

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8. Name three rules for drone use in the United States.

Drones must be flown below 400 feet. The operator must be able to see the drone at all times. Drone flights are not allowed within 5 miles of airports without permission.

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### Chapter 3: Drone Parts and Features

1. What are two ways that a drone can be flown?

A drone can be flown by remote control or a preset flight path.

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2. Describe the differences between fixed-wing drones and rotor drones.

Fixed-wing drones look like small airplanes and cover a wider area, fly for longer periods of time, carry more equipment, collect more information quickly in one flight, and are more expensive than rotor drones. Rotor drones operate like small helicopters and use rotors, are more maneuverable, can hover and fly closer to the ground, and need less room to take off and land than fixed-wing drones.

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3. Describe the three different types of cameras typically carried by agricultural drones.

Thermal cameras detect plant and soil heat. Near-infrared cameras show plant health and chlorophyll levels. RGB cameras capture images with very accurate colors.

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4. Name two things that can be measured by drone sensors.  
Drone sensors can measure an animal's temperature and weather conditions.
5. What are drone bodies made of?  
Drone bodies are made of composite materials.
6. How are drone motors powered?  
Drone motors are powered by batteries.
7. What does GPS stand for and how does it work?  
GPS stands for Global Positioning System. GPS uses a system of satellites that orbit the Earth and pinpoint exact locations on Earth's surface.

#### **Chapter 4: Flying into the Future**

1. Which type of business is most likely to use drones?  
Drones are most likely to be used in agriculture.
2. What are two reasons for the increased use of drones?  
The improving technology of drones and that they are becoming smaller and cheaper.
3. What is the predicted world population in 2050?  
9.7 billion
4. Because people need to eat, a population increase means more food will need to be produced.
5. In what type of countries is the population expected to increase the most by 2050?  
developing countries

6. Which continent has the largest number of least developed countries?

Africa

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7. Why do governments make laws about drone use?

To protect people and property and maintain privacy.

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