

*This is a classroom copy.  
Do not take this with you :)  
Thanks!*

Targeted (A P E) Reading Strategy

Evaluate the Significance of the Information: Critique

Review our RSMS (A P E) Reading Template:

A – Stands for Anticipate the Text

P – Stands for Process the Information

E – Stands for Evaluate what you read.

**Critique** – To critique an article does not mean to criticize it. It means to look at it analytically and to measure its strengths and weaknesses, to analyze how well the writing accomplished the purpose of its thesis, and whether or not the piece was well written.

The following questions are helpful to ask when critiquing a piece:

Was the piece effective? Any bias? Were you persuaded or moved?

Was the assertion proven or logically supported?

- **Critique** – Was the piece effective? Any bias? Were you persuaded or moved? Was the assertion proven or logically supported?
- In order to answer the questions above, you must find the article's thesis statement assertion, as well as all of the topic sentence assertions and see if the proof of the article stays focused on and adequately proves them.
- You must also analyze whether or not the proof is impartial (fair), or biased - if the purpose of the article is informational. If the purpose of the article is argumentative, you must make sure that the proof was offered by means of logos (logic and reason), and not pathos (feelings and biased opinion.) You must also see if the argument anticipated the opposition and then showed flaws and weaknesses in the opposition's argument.
- Finally, when critiquing, you must determine whether or not you feel as though you were persuaded or informed adequately based

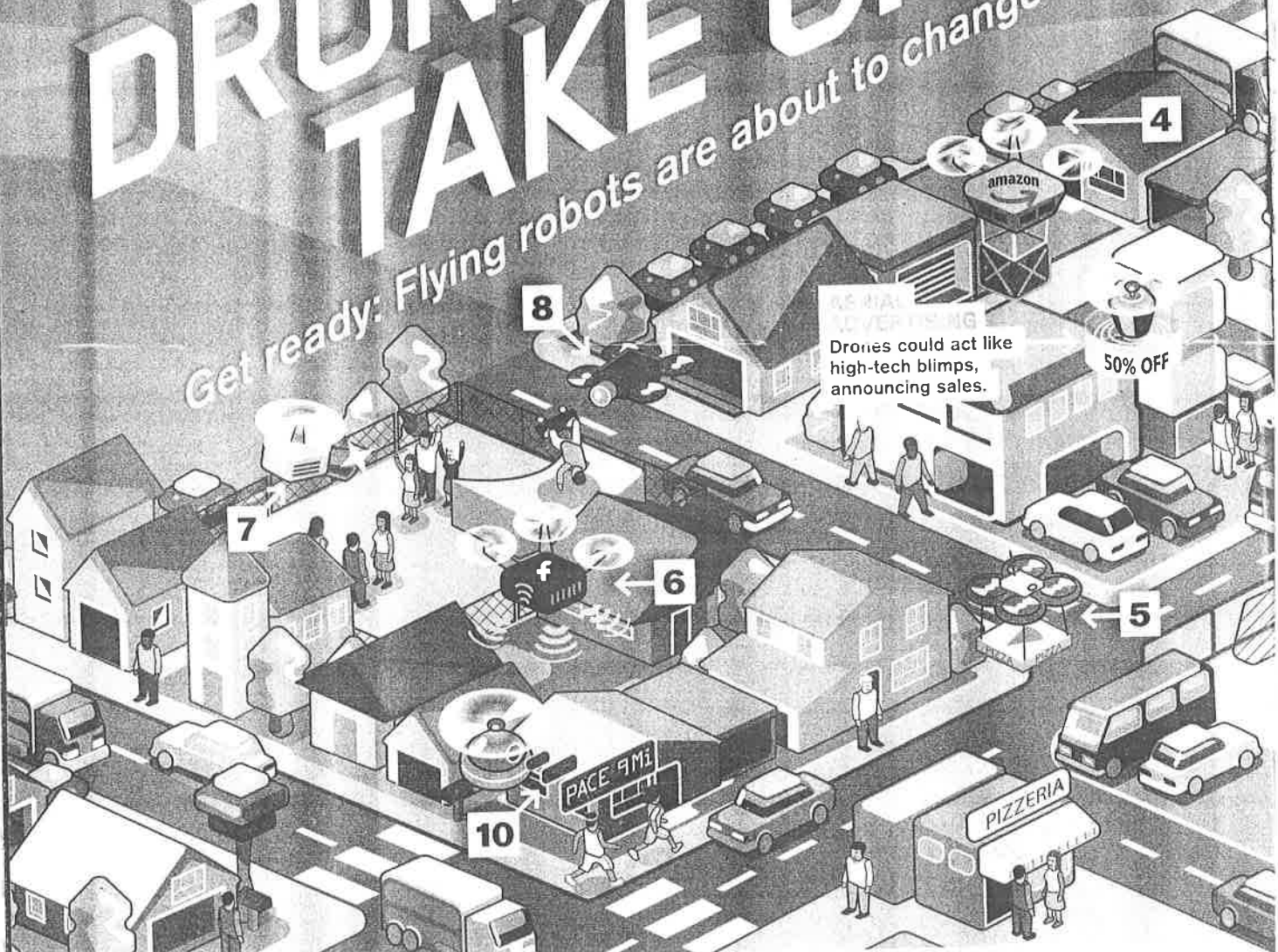
on the article's proof, and by the way it evaluated its own assertion in the conclusion of the article. Look for the following when determining this:

- ✓ Did the writer use credible sources, and document those sources accurately?
  - ✓ Did the writer fully, and without bias, present the information or prove the argument?
  - ✓ Did the writer have ethos? (Did the writer establish him or herself as an expert, or as a person knowledgeable enough to be able to present a credible argument. Is this person regarded as enough of an expert on the topic to convince or inform you?)
- 
- When critiquing an article, it is especially important to make sure to evaluate the source of the information, especially if the article came from the internet.
  - The range of information available, especially from Wiki sources, or .com sources is mind boggling, and it could have inaccurate or biased information. Thus, make sure the article you are reading comes from a credible writer and publisher.
- 
- Finally, one way to critique the effectiveness of an article is to determine whether or not the article gave enough information or proved its claim adequately enough for you to use the information to:
    - ✓ Inform another person about the article or claim
    - ✓ To take action if a "call to action" was proposed
    - ✓ To use or apply the information to your own life or to another situation
    - ✓ Interpret the information and discover beyond the text, such that you will do further investigation and research on the topic
  - Did the article interest, inspire, or convince you enough based on the proof, the purpose, the logos, and the rhetorical strategies used? Was the article or argument effective???

Did the article take you BEYOND the text into a new way of seeing, knowing, or understanding?????

# DRONES TAKE OFF

Get ready: Flying robots are about to change our lives



DRONES  
IN THE SKY  
Drones could act like high-tech blimps, announcing sales.

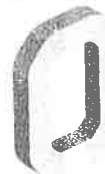
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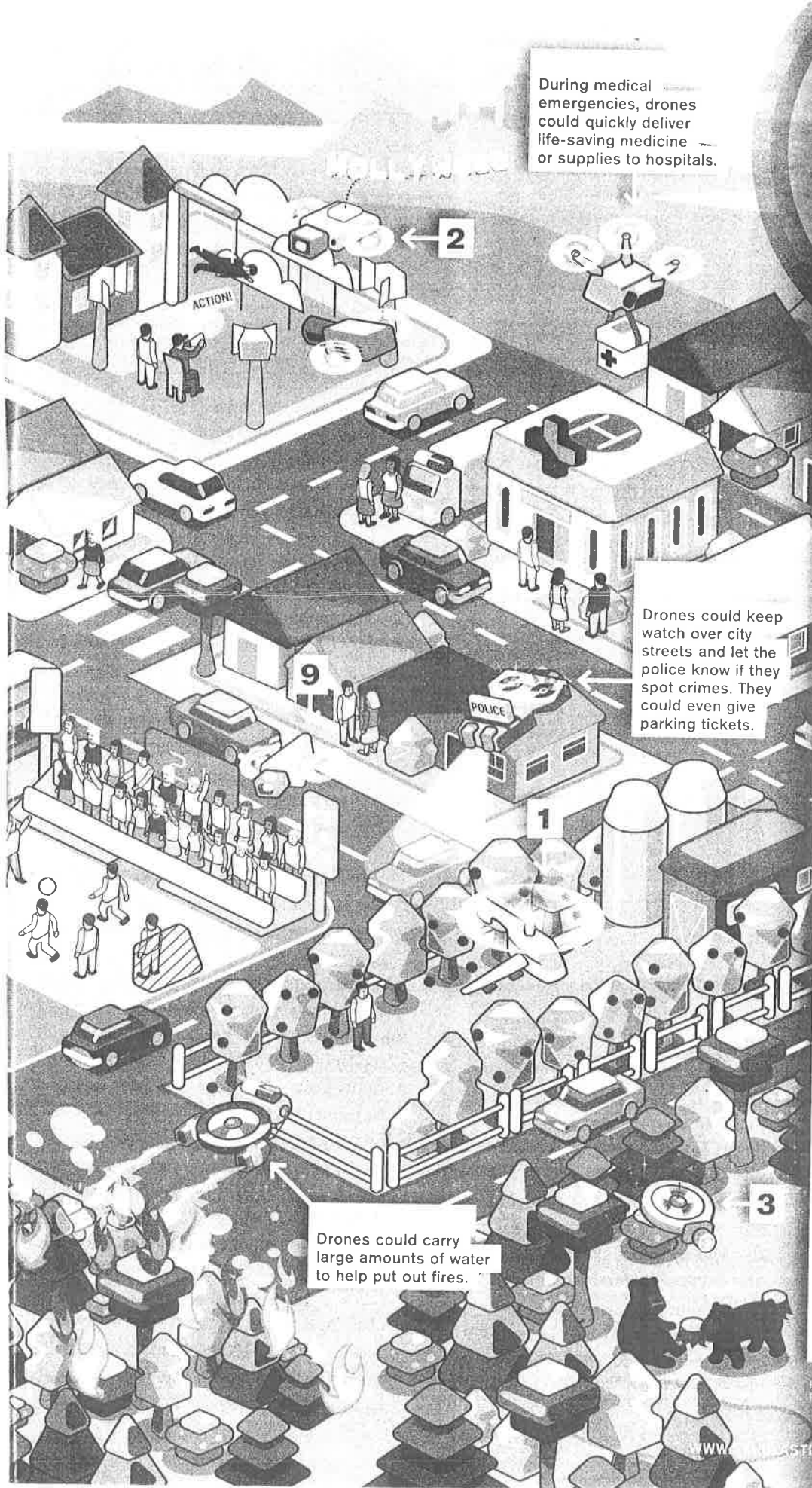
One day in the not-so-distant future, an unmanned aerial vehicle, also known as a *drone*, flies over an apple orchard.

As it zips around, it snaps high-definition photos and runs them through software that analyzes the crops' health. The software homes in on a corner of the field that doesn't look so good: Insects are attacking the apples. The drone turns and heads toward the area. Sprayers on its

wings dispense pesticide, killing the insects that are harming the trees. Then the drone returns to its patrol (see 1 in illustration).

Weeks later, an apple from that same orchard arrives at a grocery warehouse near you. From your cell phone, you add it to your cart and click "deliver." Twenty minutes later, you hear a whirring noise outside. A different drone lands on your doorstep. It sets your apple down and zips away.

*Continued on page 16*



During medical emergencies, drones could quickly deliver life-saving medicine or supplies to hospitals.

## ↑ DRONES AT WAR

Drones are playing an increasingly important role in warfare around the world. In fact, nearly one in three American military aircraft are drones. And not all of them are the size of model airplanes—the U.S. Air Force's MQ-9 Reaper can carry 1,360 kilograms (3,000 pounds) of weaponry.

Other countries, including China, Italy, and Turkey, have military drones too. Although the numbers are classified, the U.S. appears to use them the most. The targets mostly seem to be the extremist groups Al Qaeda and the Taliban, in Pakistan and neighboring Afghanistan. The U.S. and its allies have been at war in Afghanistan since 2001.

The benefit of drones is that because they're operated remotely, soldiers can be kept out of danger. But concerns have been raised about the military's use of drones: Do they make it easier to fight because the operator generally doesn't have to head into battle zones? Do drones make war seem more like video games than life-or-death struggles?

Whatever the pros and cons of drones in warfare, they're likely to play a bigger role on battlefields around the world in years ahead.

Drones could keep watch over city streets and let the police know if they spot crimes. They could even give parking tickets.

Drones could carry large amounts of water to help put out fires.

ILLUSTRATIONS: BERNESE KUSTIK  
PHOTO: ERIC DE CASTRO/AGE FODER



This scenario sounds like science fiction. But scientists think it could become a reality—and probably sooner than you think. From moviemakers to animal conservationists, people are already finding ways to use drones.

### TODAY'S DRONES

Drones were first built in the early 1900s for military pilots and gunners to use as target practice. Today the military remains the leading user of drones (*see Drones at War, p. 15*). But as drones have become smaller and more affordable, people outside the military have begun to use them.

"The thing that really surprised me when I started working with drones is that there are so many applications right off the bat," says Christopher Vo, director of education for the DC Area Drone User Group in Washington, D.C.

Today, the hottest application for

drones is in Hollywood (2). Filmmakers are using drones equipped with cameras to capture footage that would otherwise be dangerous and expensive to shoot. Action scenes, for example, have traditionally been filmed using helicopters. To capture the shot, the crew sometimes performs risky maneuvers, flying very low and close to the subject being filmed. The helicopters are also expensive to rent: They can cost \$10,000 per day.

Camera drones, by contrast, can get close to the action without endangering lives. And they're far less expensive than helicopters: A state-of-the-art camera drone costs about \$25,000 and can be used over and over again.

Drones are also being used in the new field of *precision agriculture*, like the high-tech apple orchard you read about earlier. Today's farms can span as many as 10,000 acres. With all that land to monitor, farmers rely on technology to help them keep an eye on their crops. To do that, they currently purchase photographs taken by satellites.

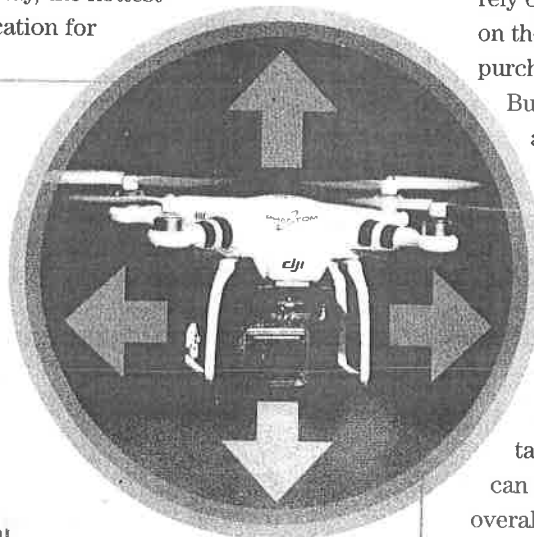
But these images are expensive to buy, and since they're taken from space, they don't show fine detail.

So farmers are starting to turn to drones. Drones' relatively low cost means they can be out over the fields every day, monitoring the crops and alerting the farmer when an area looks like it needs more attention. Because that lets farmers target spots that need treatment, they can use less water, fertilizer, and pesticides overall, which saves money and is better for the environment. Brian Taylor, director of the University of Minnesota Uninhabited Aerial Vehicle Laboratory, estimates that most farmers in the U.S. will use drones within five years.

### TOMORROW'S DRONES

In 2012, the World Wildlife Fund (WWF) got a \$5 million grant from Google to come up with new ways to end wildlife crime in Africa and Asia. The solution: camera drones.

This year, the animal conservation group will launch drones to watch over rhinos, elephants, and tigers. The drones will help scientists track down poachers who hunt



## HOW CAMERA DRONES WORK

Flying robots can capture the action at sporting events, take photos of wildlife, or conduct spy missions.



#### FLIGHT CONTROL

Software determines if the motors need more or less power to keep the drone steady.



#### RADIO CONTROL

Controllers tell the drone what to do via radio signal. The drone can be told to fly faster, descend, etc.



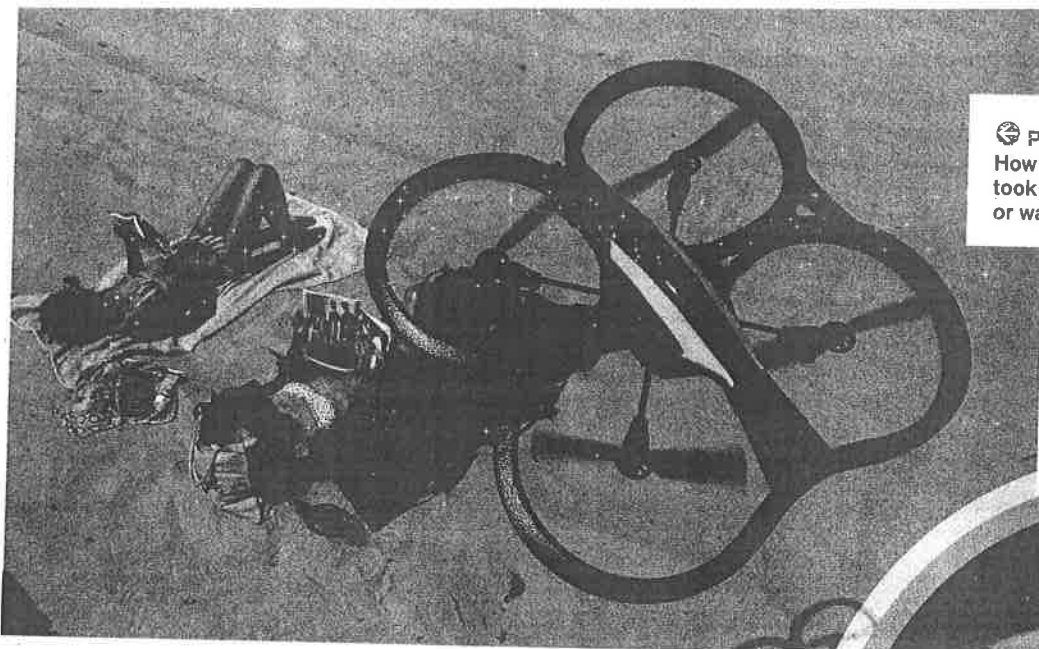
#### NAVIGATION

GPS and a *barometer*, which measures atmospheric pressure, tell the flight control software where the drone is located and how it can return to home base.



#### CAMERA

A camera can record and send video. The camera stays focused on the target while the drone flies.



### 📷 PRIVACY INVASION?

How would you feel if a drone took a photo of you sunbathing or walking home from school?

the endangered animals and illegally sell their horns, tusks, and eyes to be used in everything from carved trinkets to traditional Chinese medicines.

In the U.S., Mark Ditmer and John Vincent, biologists at the University of Minnesota, hope to use drone technology to study American black bears (3). The bears live in dense forest vegetation, which makes them hard to find, and they often flee when they sense humans nearby. Even if scientists manage to get close, their presence can change the bears' behavior. Ditmer and Vincent hope to use camera drones to solve both problems.

The pair want to test their idea on black bears that have already been implanted with devices that measure their heart rates. Data from those devices will tell Ditmer and Vincent if the drones stress the bears. If not, scientists may be able to use drones to study all kinds of animals in their natural habitats.

### FLIGHT DELAY

The bear project is on hold as Ditmer and Vincent wait for approval from the Federal Aviation Administration (FAA). The government agency is currently facing a debate about privacy and safety issues.

The public is concerned that camera drones could be used to peer into windows and spy on people. And since drones don't have flight guidelines, critics worry that they could crash into

buildings, people, and other drones. Before drones can be flown over populated areas, says Taylor, rules are needed about who can fly them, and when and where.

### AIR DELIVERY

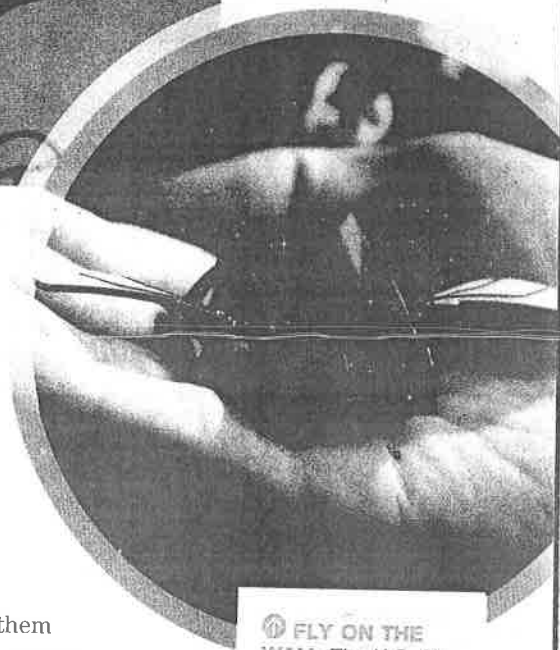
Some companies aren't letting these hurdles stop them from investigating uses for drones. Amazon says it intends to start a new service called Prime Air (4) as early as 2015. It says it will be able to deliver packages via drone in under 30 minutes. Pizza deliveries could follow (5).

Drones might even deliver Internet access. Facebook is working on a project that would launch drones that broadcast Internet signals to parts of the world that aren't connected (6).

FAA guidelines could help clear the way for personal drones too. Already, anyone can go online and buy a camera drone for a few hundred dollars. In the near future, people could use drones to snap selfies from the perfect vantage point (7) or record footage as people skateboard (8) or play soccer (9). Someday, personal drones could even race you during your workout (10).

Experts say that once we figure out the rules, the sky is—literally—the limit. ✨

—Stephanie Warren



📷 FLY ON THE WALL: The U.S. Air Force aims to make drones so tiny that they resemble small birds and insects.

### 📌 CORE QUESTION

Use the text to cite two jobs drones could perform in the near future. What are some of the pros and cons of using drones?



## These drones are for the birds

*Scientists flew robots at our feathered friends to see how close they could get*

By Bethany Brookshire 8:00am, February 13, 2015



Drones like this one — called a quadcopter — can get close to wild populations of birds, a new study shows. This could be a great thing for bird research.

Cyleone

Could flying drones near birds make them flighty? To find out, a group of researchers has just flown a robot at hundreds of birds. To their great surprise, those drones usually don't ruffle a bird's feathers at all.

The results show that drones could help scientists get a close up view of birds — without ever setting foot near their nests.

*Drones*— aircraft that carry no pilots — are more than the little robots delivering your future Amazon package. Scientists use them to count animal populations, “sniff” for sulfur near volcanoes and even to deter poachers.

The robots present a great opportunity for bird researchers and for at-home drone pilots. “They can reach areas such as wetlands or mountains or cliffs,” explains David Gremillet. “That’s a real bonus.” Gremillet is an ecologist at the Center for Ecology and Functional Evolution in Marseilles, France. But as these little flying machines get more popular, scientists have worried about how animals might react to being spied on from the sky.

Watching a squirrel steal a GoPro or a nest of owls discover one of these small cameras in front of their nest is fun. It might inspire people with cameras or drones to try getting a rise out of other wildlife. But you can't just fly a drone up to a bird. "You may harass birds if you get too close," Gremillet warns. "You could chase them away from feeding or breeding grounds, and increase their stress." And of course, scientists want data from birds that are behaving naturally, not birds on the run. But no one knew just how close you could fly a drone without disturbing a bird.



This is a common greenshank. These wading birds are usually quite easily startled, but they had no problem with drones flying as close as four meters (13 feet).

JJ Harrison ([jjharrison89@facebook.com](https://www.facebook.com/jjharrison89))/Wikimedia Commons

That's why Gremillet and his group of researchers flew a *quadcopter drone* at more than 200 birds. This is a small robot with four sets of helicopter blades on the top. Those blades allow it to hover in the air.

The scientists used the drone to sneak up on three different species. First, they approached mallard ducks in a local zoo. Then they flew the robot toward groups of wild greenshanks — a wading bird that prefers wetlands — and a wild flamingos in the Camargue wetland. (This is an area south of Arles in France, where the Rhone River flows toward the Mediterranean Sea.)

For each flight, a trained drone pilot carefully took up position between 50 and 100 meters (164 to 328 feet) from a group of birds. The pilot directed the copter, equipped with a camera, toward the birds. One time the drone approached quickly. Another time it would zoom over slowly. The scientists also experimented with angle. The drone might approach from near eye level. Other times it would come in from higher. It might even drop down from directly over the birds' heads.

Each time, the scientists watched carefully from a distance to observe how the birds reacted. If the flying robot did not bother the birds, the animals wouldn't move. But when the drone got too close, the birds might move their heads and tails, eventually walking off or swimming away. And if the machine was too disturbing, the birds just took flight.

In fact, most times the birds largely ignored the robots. Four times in every five, the drones could fly to within four meters without the birds flicking a feather. Wild birds are very nervous. So Gremillet said his team was extremely surprised to get as close as it did.

The birds were most likely to stay calm when the drones approached the birds at eye level or from an angle. Approaching from directly above the birds disturbed them most. Gremillet says that this might be because an object coming in from directly above looks more like a predator.

Getting an aerial robot even four meters (13 feet) away is very exciting, says Juan Jose Negro. He's an evolutionary biologist who directs the Doñana Biological Station in Seville, Spain. "It's like Big Brother; you're right there," he says. "If you use a camera and sensors you could take images, test the temperature and the air pressure." Equipped with microphones, drones could even record sounds the birds make. With these spy technologies, he says, "It's just like being in the middle of the flock. I've never been that close."

The next step is to study how birds react to different drones and in different situations. The machine the scientists used for this study was very quiet. The sound of its motor, about 60 decibels, was as loud as a normal conversation. The birds might not have tolerated noisier drones getting as close to them.

Shape also might be important. The quadcopter is boxy. Fixed-wing drones look more like



airplanes — and like other birds. This could present problems, Gremillet notes. “Fixed-wing drones make less noise,” he says. “But their shape might remind some birds of predators. It’s important to test their impact.”

While the birds appeared to tolerate a visiting drone, this should not give people license to start flying their favorite robots towards animals for fun. Studies like these help scientists figure out how we can best use aerial machines to watch wildlife *without* disturbing their normal behavior.

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## Power Words

(for more about Power Words, click [here](#))

**aerial** Of or taking place in the air.

**autonomous** Acting independently. Autonomous vehicles, for instance, pilot themselves based on instructions that have been programmed into their computer guidance system

**drone** A aircraft or missile that carries no pilot aboard. A drone may fly autonomously, along a preprogrammed path or under the control of a pilot on the ground. A drone also may be called an unmanned aerial vehicle (UAV).

**ecology** A branch of biology that deals with the relations of organisms to one another and to their physical surroundings. A scientist who works in this field is called an ecologist.

**fixed wing** The term for a type of aircraft whose wings generate lift without having to move. Most jets and passenger planes fall into this category.

**poach** (in ecology) To illegally hunt and take a wild animal. People who do this are referred to as poachers.

**population** A group of individuals from the same species that lives in the same area.

**predator** (adjective: predatory) A creature that preys on other animals for most or all of its food.

**stress** (in biology) A factor, such as unusual temperatures, moisture or pollution, that affects the health of a species or ecosystem. (in physics) Pressure or tension exerted on a material object.

**surveillance** A term for watching or keeping track of the behavior of others, usually in a stealthy manner or from a distance.

**thermal** Of or relating to heat.

**wetland** A low-lying area of land either soaked or covered with water. It hosts plants and animals adapted to live in, on or near water.

**Readability Score: 6.4**

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## Further Reading

S. Ornes “[Drones put spying eyes in the sky.](#)” *Science News for Students*. November 6, 2014.