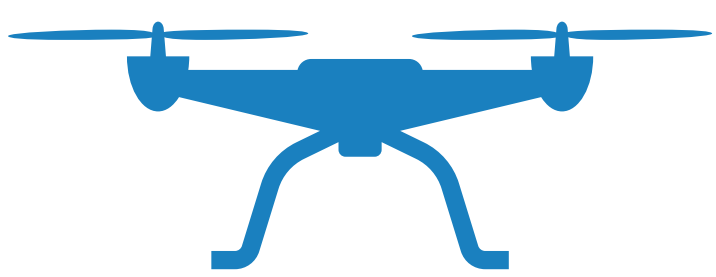


Drones

What Is It?

A drone, or unmanned aerial vehicle (UAV), is a remote-controlled device or remote-piloted aircraft. Drones can also take the form of autonomous vehicles used on land or water. Most often, drones refer to small flying devices with varying degrees of autonomy, either fixed-wing or **rotary**.



How Is It Powered?

Most drones run on electric charge. Batteries in drones vary in size and charge time in order to maintain the drone's light weight.



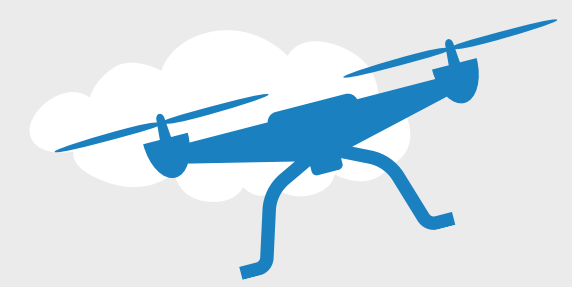
What Does It Cost?

Due to innovation in both drone size and commercial usage, prices range from palm-sized drones for as little as \$20 to precision-engineered professional and industrial drones upwards of \$50,000. Use of drones can save costs for other projects by replacing large equipment, human operators or field personnel, and employing artificial intelligence.



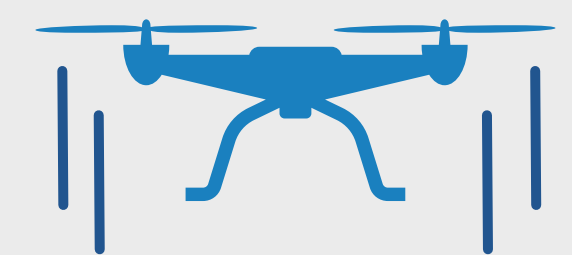
How Does It Work?

1. Commercial drones run on battery power that can be charged through any electrical socket.



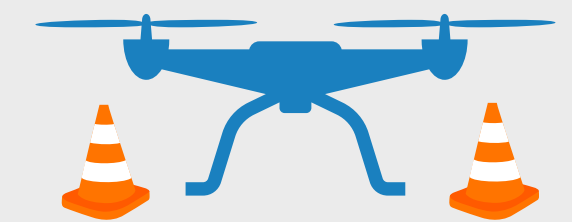
2. Drones are turned on and connected to a remote control or operating equipment through a wireless signal in radio waves.

3. Most commercial drones rely on throttle controls to first rotate their rotors to generate lift.

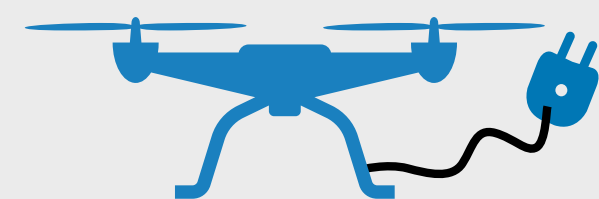


4. Drones can pivot to change their direction or turn 360 degrees to maximize maneuverability.

5. Pilots can adjust the view of their drones from third-person to first-person to best utilize the drone's cameras and other tools.



6. Most drones have a maximum range that it can travel away from the pilot before losing the wireless signal. Many also alert pilots if the drone strays too far away.



What's Their Use?

Drones have been utilized for tasks ranging from photography to topographical mapping. Other commercial uses include filmmaking, package delivery, agricultural applications, emergency or disaster response, and surveying or inspections.



Point

- Commercial drone applications can improve local economies and streamline efficiency through package delivery, roof inspections, traffic reporting, and more.
- High-quality cameras can generate accurate imaging for art, reporting, inspections, surveying, and more.
- Drones can be substituted into jobs that are dangerous to humans or costly to conduct in-person, like surveying disaster areas.
- Drones can be equipped with cameras, artificial intelligence, and other innovative tools.
- Drones can be used for security monitoring or to monitor at-risk wilderness areas, animal populations, or conservation efforts.



Counterpoint

- Local and federal regulations set boundaries for what airspace drones may occupy, limiting disruptions to airports, traffic, and more.
- Privacy laws sometimes inhibit users' ability to monitor certain areas with drones.
- Drones may be vulnerable to adverse weather conditions and lack the capabilities of on-site personnel.
- Drones may be susceptible to hacking or other criminal sabotage.
- Collisions with birds or animals can harm wildlife, while battery range and technical limitations can impact time, scope, and scale of monitoring.

Did You Know?

Innovative "ambulance drones" carry medical supplies and are equipped with both a camera and a speaker so that it can reach an injured person and tell them what to do.

What's Next?

Innovation in drones has decreased costs and increased applications, making them a standard tool in virtually every industry. For example, drones in agriculture have the ability to carry large amounts of seeds to cover more acres for farmers, deliver larger packages to homes or businesses, and monitor areas prone to natural disasters using longer-lasting batteries.