






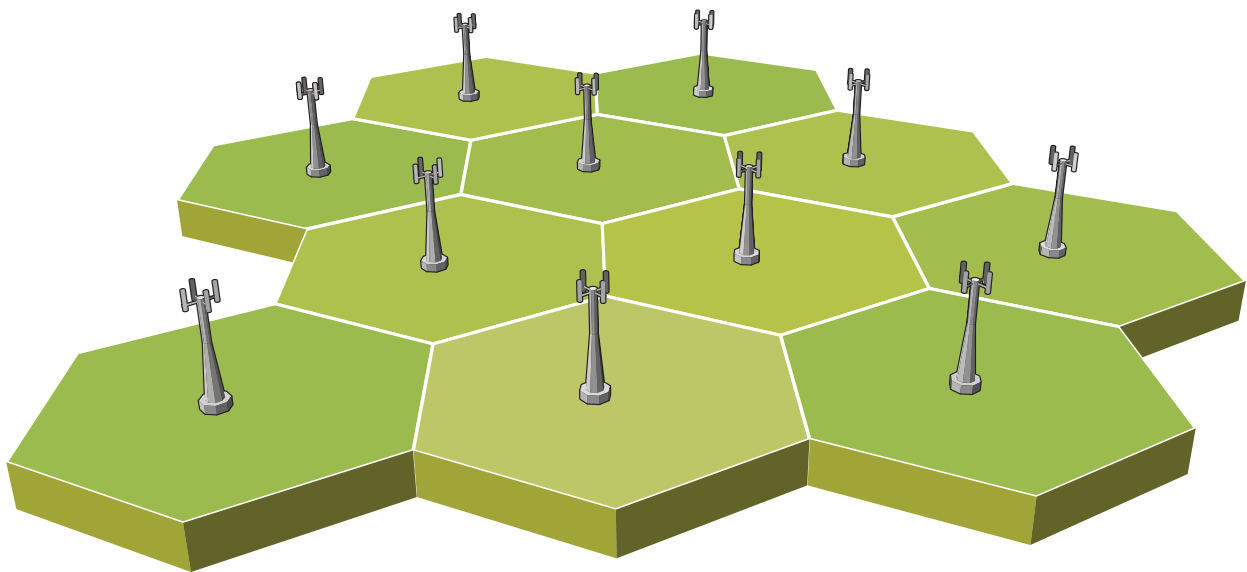
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## How Cell Phones Work

Not long ago, few people had even heard of **cell phones**. If you wanted to make a call from outside, you needed a pocket full of change and a pay phone. Now people of all ages are talking on devices small enough to fit in your back pocket. With technology moving so quickly, our world is changing at full speed. When it comes to **communication**, cell phones are a great advancement of the modern age.

You know that we use cell phones to talk **remotely**. Have you ever wondered why they are called cell phones? Cell phones are named after their service areas. Service areas are split into many **cells**. Each cell has six sides and a tower in its center.



Now you know how cell phones got their name. The real fun lies in learning how they work. Calls move through the air on electricity. They move like radio signals. They travel from tower to tower. If something gets in the way, the call is blocked. Weather, trees, hills, and even large buildings can cause problems.

# The Birth and Growth of Wireless Transmission

Where did cell phones come from? Cell phone history began over 150 years ago. A British scientist by the name of Michael Faraday studied electricity. He wondered if it could travel through the air. The answer was yes! The **transmission** of electricity without wires is the starting point for **wireless** communication today.

The next step in cell phone history came in 1866. That year, Dr. Mahlon Loomis claimed to have been the first person to send signals without wires. He said he sent the signals between two mountaintops, several miles apart. Like Benjamin Franklin, he may have used kites!

In 1947, Bell Labs introduced cell phones for police cars. However, these early cell phones were big. They could not be carried easily, but they did work in a moving car.

Then another new phone came along in 1973. Martin Cooper invented a phone that could be carried. Cooper began to test cell phones in Chicago. He had 2,000 customers in 1977. The first **portable** cell phone was sold to the public in 1983.

Soon there were too many users! The airways became too crowded. By 1987, there were over one million cell phone users. The cell phone industry had to come up with new technology. It created the **digital** wireless systems that we use today.



Martin Cooper and the 1983 Motorola DynaTAC. It was 13 inches tall, weighed about two pounds, took 10 hours to charge, and cost \$3,995.

## Landline or Cell Phone?

Today many people are giving up their **landline phones**. Landline phones use signals that travel through metal wire or **fiber optics**. One in four U.S. homes uses cell phones only. There are reasons why some people keep their landlines. Let's take a look at some of the advantages for both kinds of phones.



### Advantages of Landlines

- 1 One phone number for many users. Callers can reach everyone in your house by dialing one number.
- 2 Many phones. You can have a phone in every room. You don't need to carry your phone.
- 3 Better signal. Landlines don't depend on wireless signal strength. Cell phones can drop calls where connection is poor. Voice quality on landlines is usually better.
- 4 Power. Cell phones must be charged. Otherwise, you may miss calls or be unable to make calls. Corded landlines work during power outages.
- 5 911 calls. Emergency services can automatically locate callers who use landlines. In large emergencies, such as earthquakes, cellular systems are often overloaded.



## Advantages of Cell Phones

- 1 Mobility.** Cell phone users can receive and make calls from almost anywhere. Landlines are limited to home or office use.
- 2 Safety.** Cell phones add to your safety. You can call in case of emergency.
- 3 Features.** Cell phones have more options than landline phones. These options include built-in cameras, Internet access, and texting. **Smartphones** now function like small computers.
- 4 Power.** Cordless telephones connected to landlines lose power during power outages. Their battery life is often shorter.
- 5 Ease.** You can call ahead to let someone know you're late. You can call for directions when you're lost.





## Chapter Four

# The Future of Cell Phones

Today the total world population is nearly seven billion people. About 5.3 billion of those people are cell phone users. This means 80 percent of the world has technology at their fingertips!

Over time, we have watched the cell phone change in many ways. People use cell phones for more than just talk. Each year, over four trillion text messages are sent. Most cell phones also have Internet access.

Cell phones cannot work in train stations now. Soon that may be possible. Communication is moving at super speed. Maybe one day, the cell phone will be as small as a button. Where do YOU think cell phone technology will go next?



## Glossary

**cell:** wireless phone service area.

**cell phone:** cordless phone that can be used in different service areas.

**communication:** to share thoughts, feelings, or information.

**digital:** relating to information in the form of numbers (digits).

**fiber optics:** flexible thin glass fibers used to send information using light.

**landline phone:** phone that uses signals that travel through wires.

**mobility:** ability to move or be moved.

**portable:** able to be carried by hand.

**remotely:** located far away, from a distant place.

**smartphone:** cell phone with advanced computer functions.

**transmission:** process of sending signals.

**wireless:** without wires.