Photo Across the Ocean

How a Picture Travels Under the Sea | Level C2 | EnglishBridges.com

Before You Read

Discuss these questions with a partner.

1. Who do you send photos to most often, and how far away are they?
2. What do you imagine happens between the moment you tap send and the moment a friend sees your photo?
3. How might the experience of sending messages abroad differ between countries, generations, or types of phone network?

Reading: Photo Across the Ocean

Sending a photo from Seoul to New York feels **mundane**, but a lot happens in a second or so. First, the messaging app compresses the photo, often to about two megabytes, or some 16 million bits. Many apps then encrypt it, so anyone who manages to **intercept** it sees only **gibberish**. Once the file is encrypted, it is chopped into packets of up to about 1,500 bytes. Each packet carries a label with its destination and its place in the sequence.

As soon as the packets leave the phone, they travel as radio waves to a nearby cell tower or Wi-Fi router. There, the signal becomes pulses of laser light in fiber-optic cable. Inside glass, light travels at about 200,000 kilometers per second. Fiber carries huge amounts of data with little loss, so it forms the **backbone** of the internet.

No single machine plans the route. Each router reads the address and passes the packet to a neighbor that is likely to bring it closer. If a link is **congested** or broken, the router sends the packet another way. This **decentralized** design makes the network **resilient**. Packets from the same photo can even take different paths.

To cross the Pacific, the data travels on cables that **come ashore** near Busan or connect through Japan. On the deep seabed, these cables are **slender**, about as thick as a garden hose. Undersea cables carry around 99 percent of the data that crosses oceans. Satellites carry only a small **fraction**. Along the way, each repeater **boosts** the fading light.

The packets arrive **jumbled**, and a few are lost. The receiving device **reassembles** the packets in order and asks for the missing ones again. The photo does not appear until every piece is in place. A round trip between Seoul and New York typically takes about 180 milliseconds. Most of that **latency** comes from distance and routing. Each year there are about 150 to 200 cable faults, mostly when fishing gear or ship anchors **snag** cables.

Vocabulary: Fill in the Blank

Complete each sentence with a word or phrase from the box. Use each one once.

jumbled	**gibberish**	**slender**	**come ashore**	**boosts**	**backbone**	**decentralized**	**intercept**
congested	**latency**	**resilient**	**mundane**	**fraction**	**reassembles**		

1. After a week of exciting travel, going back to my _____ routine felt strange.
2. The police managed to _____ the stolen goods before they left the port.
3. My little brother was so sleepy that he was talking complete _____.
4. Volunteers are the _____ of the festival; without them it could not run.
5. The city center is badly _____ during the morning rush hour.
6. In a _____ system, many local offices share the power to decide.
7. Small businesses that adapted quickly proved surprisingly _____ during the crisis.
8. Turtles _____ on this beach every summer to lay their eggs.
9. The _____ tower looked as if the wind might bend it.
10. Only a tiny _____ of the visitors stayed longer than an hour.
11. A cup of coffee _____ my concentration for about an hour.
12. The letters of the word were _____, so we had to put them in order.
13. The mechanic takes the engine apart, cleans it, and _____ it.
14. Gamers hate high _____ because their actions appear on screen too late.

Word Partners: Collocations and Word Families

Part A. Collocations

Match the two halves to make common phrases. Write the letter on the line.

1. mundane	_____	**a.** backbone of the internet
2. intercept	_____	**b.** your confidence
3. talk complete	_____	**c.** of a second
4. form the	_____	**d.** a message
5. heavily congested	_____	**e.** gibberish
6. remarkably	_____	**f.** roads
7. in a fraction	_____	**g.** resilient
8. boost	_____	**h.** chores

Now choose three of the phrases and write your own sentences.

Part B. Word families

Complete each sentence with the correct form of the word in brackets.

1. Each repeater gives the fading signal a _____. (*boosts*)
2. Traffic _____ is worst in the evening, when everyone is streaming video. (*congested*)
3. Some governments want more _____ of power to cities and regions. (*decentralized*)
4. Her _____ after the accident surprised everyone. (*resilient*)
5. The drawer was a _____ of old cables and chargers. (*jumbled*)
6. The police _____ of the message stopped the plan. (*intercept*)

Comprehension Questions

Answer in full sentences.

1. What does the messaging app do to a photo before it leaves the phone?

2. Why does encryption matter if someone intercepts the data?
3. What two pieces of information does each packet carry?
4. How do the packets get from the phone to the fiber-optic network?
5. Explain how routers move packets without a central plan.
6. Why is the network described as resilient?
7. Why are satellites less important than many people think?
8. What problem does the receiving device have to solve, and how does it solve it?
9. Why does the writer end with cable faults? What do they reveal about the internet?
10. **True, False, or Not Given:** *"Satellites carry most of the data that crosses oceans."* Explain your answer using the reading.
11. **Yes, No, or Not Given:** *"The writer suggests that one broken link can stop all internet traffic."* Explain your answer using the reading.
12. **Author's purpose:** Why does the writer say the cables are "about as thick as a garden hose"? Is it (a) to help readers picture how surprisingly thin they are, (b) to explain how the cables are cleaned, or (c) to compare them with water pipes in cities?

True or False

Circle T (true) or F (false). Be ready to correct the false sentences.

1. Many messaging apps compress a photo before sending it. **T / F**
2. A two-megabyte photo is usually sent as a single packet. **T / F**
3. Light in glass fiber travels at about 20,000 kilometers per second. **T / F**
4. One central computer plans the full route for every packet. **T / F**
5. Packets from the same photo can take different paths. **T / F**
6. In the deep ocean, a submarine cable is about as thick as a garden hose. **T / F**
7. Satellites carry most of the data that crosses oceans. **T / F**
8. Some packets can be lost on the way and sent again. **T / F**
9. A round trip between Seoul and New York typically takes around 180 milliseconds. **T / F**
10. Most cable faults are caused by deliberate attacks. **T / F**

Language Focus: Time Clauses (once, as soon as, until, by the time)

A **time clause** begins with **once, as soon as, when, after, before, until** or **by the time** and tells us *when* the main action happens.

For the future or a general process, use a **present tense** in the time clause, not *will*: *As soon as I get home, I'll call you.* (not *will get*)

Use the **present perfect** to stress that one step is finished first: *You can leave once you have finished.*

From the reading:

"**Once** the file **is** encrypted, it is chopped into packets of up to about 1,500 bytes."

"The photo does not appear **until** every piece **is** in place."

Tip: *By the time* often pairs with the future perfect in the main clause: *By the time you read this, I will have left.*

Part A. Sentence starters

Finish each sentence so that it is true for you. Keep the time clause in a present tense.

Plans and the future

1. As soon as I get home today, I _____
2. Once I have saved enough money, I _____
3. By the time I am forty, I _____

Habits and routines

4. I never check my messages until _____
5. When I travel abroad, I always _____

Part B. Questions

Answer each question in a full sentence. Try to answer using a time clause with once, as soon as, until, or by the time. *Then ask a partner.*

6. What is the first thing you do when you wake up?
7. What will you do as soon as this class ends?
8. How long do you usually wait before you reply to a message from a friend?
9. What do you want to have done by the time you graduate or retire?
10. When will you feel confident enough to give a presentation in English?

Discussion Questions

Discuss with a partner or in a small group. Give reasons and examples.

1. How many photos or messages do you think you send in a typical day? Who receives most of them?
2. Before reading, did you think satellites or cables carried most international data? Where did that idea come from?
3. Which step in the photo's journey surprised you most, and why?
4. How do you feel when a message takes longer than usual to send? What do you assume has gone wrong?
5. Have you ever had a slow or broken internet connection at an important moment? What happened?
6. Why do you think so few people know how the internet physically works?
7. Encryption is meant to keep data safe. How much do you trust tech companies with your private pictures?
8. Is it better for a system to be decentralized, like the internet, or controlled from one center? Think of examples beyond technology.
9. The word resilient is used for networks, people, and cities. What makes a person or a community resilient?
10. A few hundred cables connect the continents. Should countries treat them as critical infrastructure, and what would that mean in practice?
11. Who should pay to protect and repair undersea cables: governments, telecom companies, tech firms, or users?
12. How has the speed of communication changed relationships between people who live far apart?
13. Is instant global communication always a benefit? What might we lose when everything arrives within a second?
14. Some countries have only one or two cables linking them to the rest of the world. How might that affect their economy and politics?

Online Practice

Scan the code or visit **englishbridges.com/lessons/photo-across-the-ocean** for the full reading, vocabulary activities, the Speed Challenge, typing practice, and AI conversation prompts.