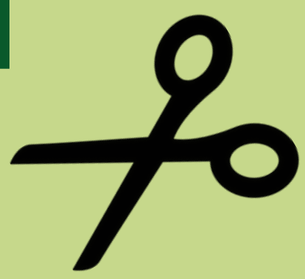
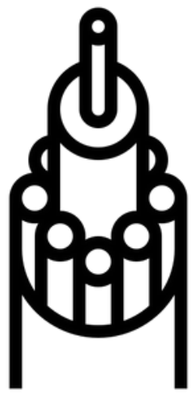
MAPPING DIGITAL TECHNOLOGY

HOW DOES THE INTERNET WORK?



Cut out the boxes and **play pairs** with the internet terms!
Then put them on the world map and explain them.
What do these terms have to do with the global Internet?

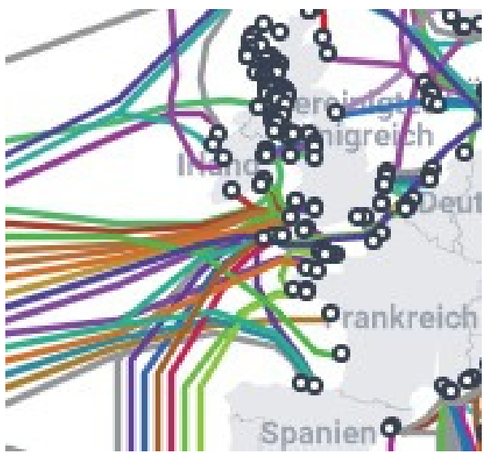




fibre optic cable



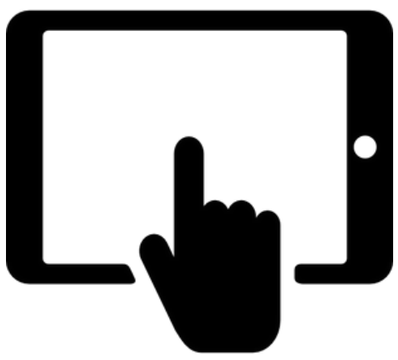
wireless router



submarine cable map



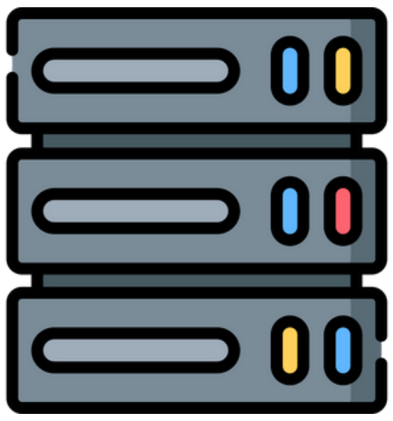
mobile tower



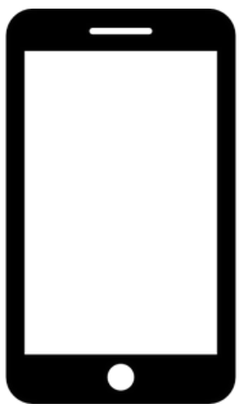
tablet



live streaming



server



phone

Co-funded by the European Union
Author: Petra Szucsich, Picture: www.submarinecablemap.com
Icons: www.flaticon.com (Freepik /Fibre optic cable by Chattapat) / Mascot "SAM" by Judith Neuthard

MAPPING DIGITAL TECHNOLOGY

HOW DOES THE INTERNET WORK?

What happens when you stream a video?

Okay, imagine you have a very special TV, but instead of getting all your shows and movies from a DVD or a TV station, you get them instantly, like from a “magic source”! That's what we call "streaming".

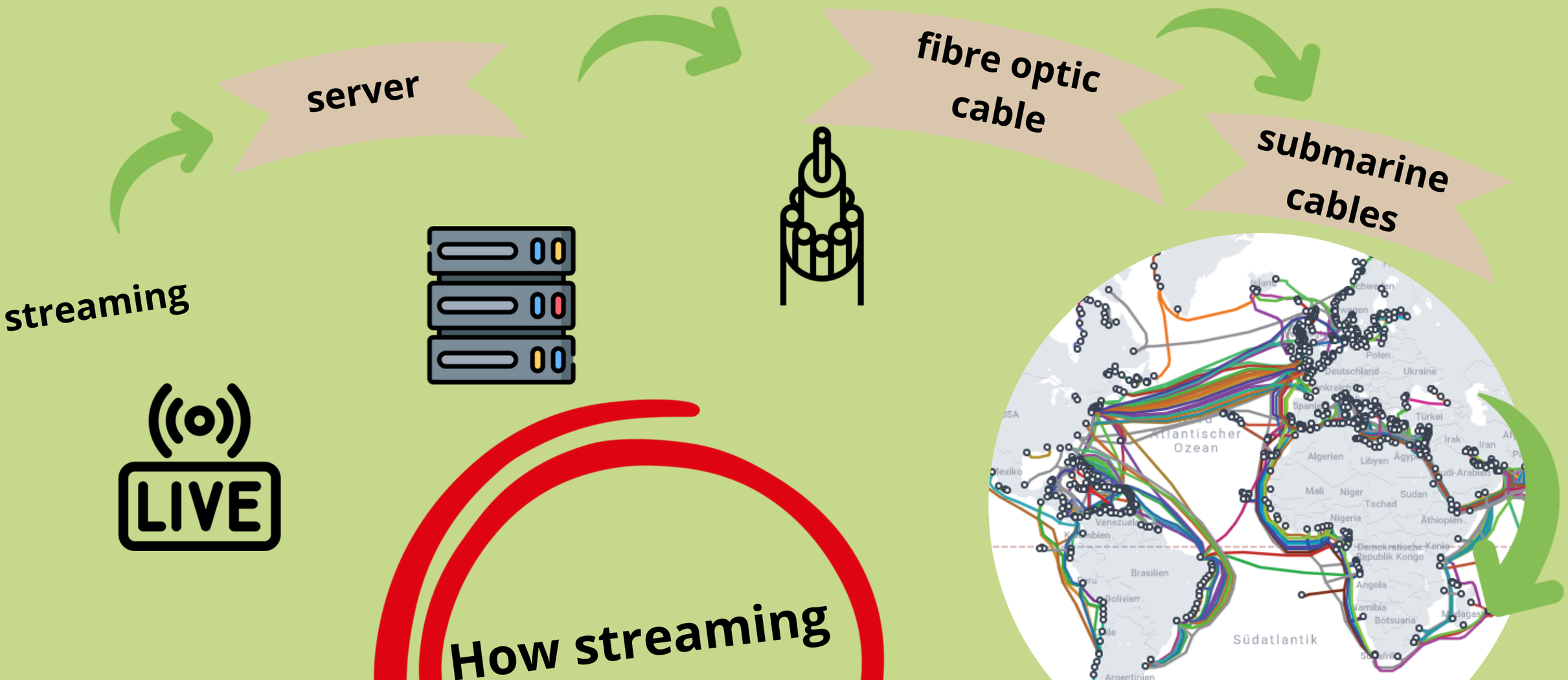
1. Your **tablet or phone**: Picture your device as your TV on which you want to watch a fun video.

2. The **video** you want to watch: Think of your favorite show or movie. Instead of waiting for it to come to you on a DVD, it's like asking a friend to show you a video immediately.

3. The **Internet Highway:** To watch that video, you need to travel on the "Internet Highway." It's like a superfast road that connects you to where the story is kept. This road is made up of **cables, routers, and servers**.

4. The magical video source, the **server**: Imagine there's a place, like a magical library, where all the videos (shows and movies) are kept. This is called a "server". It's like the place where your friend keeps all the exciting videos.

5. **Streaming**: When you say, "I want to watch this," your friend (the server) quickly sends the story to your device through the internet highway. You don't have to wait for the whole video to arrive; it comes bit by bit, just enough for you to watch and enjoy. Cool, right? 😊✨



Co-funded by the European Union
Authors: Martin Sankofi, Petra Szucsich Picture: www.submarinecablemap.com / circle by Freepik
Icons: www.flaticon.com (by Freepik / Banner by Dooder) / Fibre optic cable by Chattapat, Arrows by Creative Stall Premium

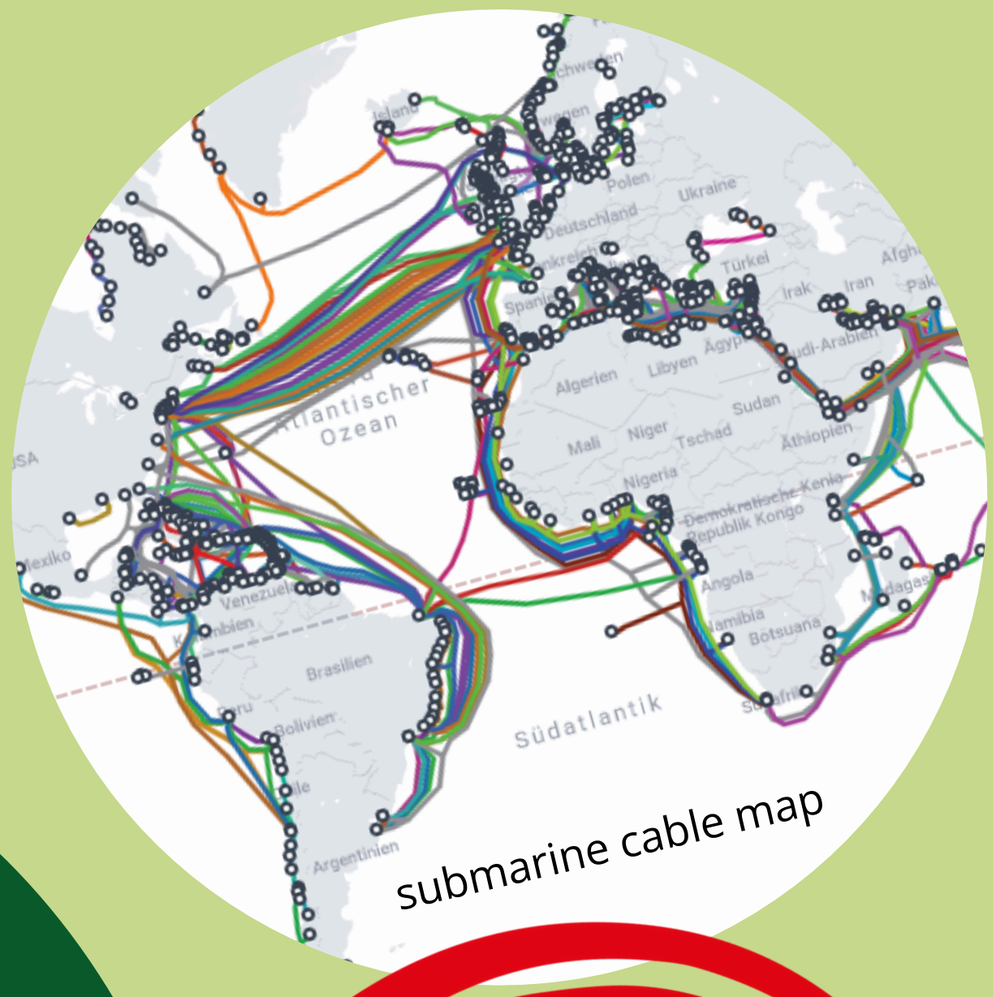
MAPPING DIGITAL TECHNOLOGY

SUBMARINE CABLES, DATA CENTRES & E-WASTE

Submarine Cable

A submarine cable is laid in the sea or in waterways. Usually these cables either carry electricity or are used for telecommunications. When you use the internet, information is usually sent through such cables.

As of early 2024, there are about **600 active and planned submarine cables**. This number is constantly changing as new cables are laid out and old ones are taken from the net.



submarine cable map

Use threads to show the cables!

Find out more about submarine cables:

Watch the short video about submarine cables.

Use the website about submarine cables to find out about how the Internet connects computers across the world.

TASK

Click on the cables to find out more about them.
Find the following and put threads on the map:

- a particularly long one
- a particularly short one
- one that is currently being constructed
- the one closest to your home country
- an area where there are a lot of cables

Submarine Cable Map

TeleGeography's comprehensive and regularly updated interactive map of the world's major submarine cable systems and landing stations.

submarinecablemap.com

https://www.submarinecablemap.com

submarine cable map

SCAN

video

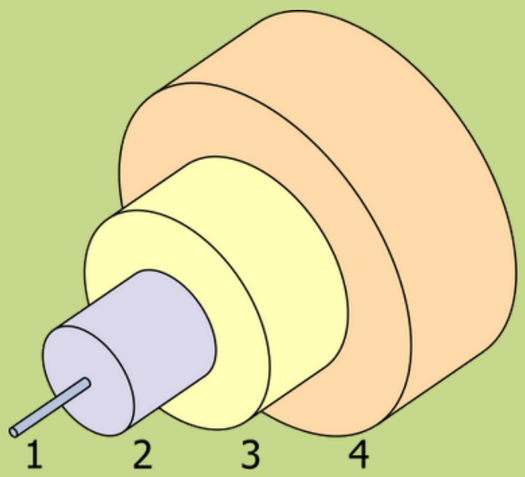


Diagram of a single mode (SM) optical fiber. 1.- Core 8-10 µm 2.- Cladding 125 µm 3.- Buffer 250 µm 4.- Jacket

Co-funded by the European Union

Pictures: www.submarinecablemap.com / circle by Freepik / Author: MartinSankofi
Icons: www.flaticon.com (by Freepik, fibre optic cable by Kiddle.co cc by 3.0)

MAPPING DIGITAL TECHNOLOGY

SUBMARINE CABLES, DATA CENTRES & E-WASTE

Data centres and server farms

Imagine **data centers** as big digital warehouses where all our online files are stored. These centers need **lots of electricity (energy)** to keep our emails, videos, and games safe and cool. This energy often comes from fossil fuels like coal and natural gas, which release carbon dioxide (CO_2) and **make our planet warmer**.

Think of data centers as factories that produce **invisible pollution.** More people using the internet means we need even more data centers. It's like inviting more friends to a party – you need more space and energy!

Scientists are working to make **data centers "greener"** by using **wind and solar power**. We can also help by using the internet wisely and turning off devices when we are done.



TASK

- Use the **links below** to find out where major **data centres and server farms** are located **around the world.**

- Then take the **wooden cubes** provided and place them on the countries and continents that have the largest data centres and server farms.

Data centre map:

- https://www.datacentermap.com/
  You have to click "Explore Map".

Google also has data centers in various places. Find out where they are:

- https://www.google.com/about/datacenters/locations/

data centre map

SCAN

Google data centres



Co-funded by the European Union

Teacher Academy Project TEACHING SUSTAINABILITY

Author: Petra Szucsich

Icons: www.flaticon.com (by Freepik and manshagraphics) / Picture: Wikimedia Commons

MAPPING DIGITAL TECHNOLOGY

SUBMARINE CABLES, DATA CENTRES & E-WASTE

Global E-Waste

E-waste (electronic waste) includes anything with plugs, wires and electronic components. Common sources of e-waste include computers, mobile phones, televisions and all kinds of household appliances, from hair dryers to lamps and toys.

When broken or unwanted electronics are dumped in landfills, **toxic substances** can leach into soil and water. Electronics also contain **valuable non-renewable resources** such as gold, silver, copper, platinum, aluminium and cobalt.

In some places in Africa, people burn e-waste to get valuable metals like copper. But burning is a big problem! It makes **dangerous smoke** that can harm our planet and our health!

So it is very important to **dispose of e-waste correctly**!









global
waste map

TASK

Look at the following link:
https://globalewaste.org/map/



- Find out which countries produce a lot of e-waste and which don't.
- Which European countries produce the most electronic waste? Which countries on other continents?
- Write the kilograms of e-waste per capita (=per person) on about **10 sticky notes** and find the countries on the map.
- Stick the notes to the appropriate countries **on the world map** and add some of the **e-waste samples** provided.



Co-funded by the European Union
Author: Petra Szucsich
Icons: www.flaticon.com (by Freepik and Muhammad Usman / Picture: Wikimedia Commons

MAPPING DIGITAL TECHNOLOGY

THINK ABOUT THE INTERNET

QUESTIONS FOR DISCUSSION

- How does the internet work in your home and in your town/village?

- Why is your signal sometimes very fast and sometimes very slow?

- Where can we find big server farms?

- Why are big server farms not good for our climate?

- Where can we find lots of submarine cables? Where just a few? Why?

- Why do you think some countries have better internet access than others?

- What are the drawbacks of a bad internet connection?

- Has your view of the digital network on the globe changed?

CC BY NC

Author: Martin Sankofi