



Gallery overview

Teacher briefing notes

Welcome to **Web Lab**. This is the place to discover the power of the web and explore the possibilities of sharing a space with the worldwide online community.

Web Lab contains five experiments that users can physically interact with at the Science Museum as well as engage with online.

The five experiments are:

Universal Orchestra – Play musical instruments with people across the globe. Students explore how the modern web allows for real-time collaborations and interaction.

Teleporter – Students look into a viewer and see a live video stream showing a 360° view of a location somewhere else in the world. Because the video is compressed it's able to travel to you extremely quickly.

Sketchbots – Students have their photo taken, then their portrait is drawn by a robot. A computer turns the photographs into information that can be understood by the robot.

Data Tracer – Students perform an image search and follow their search's journey across the globe. They see where the image is stored and how long it takes a data packet to travel to the remote computer.

Lab Tag Explorer – Students collect their Lab Tag to store their artefacts. They can use their Lab Tag to access and download the things they did in Web Lab.

Overall learning outcomes

- Deeper understanding and appreciation of the power and possibilities of the modern web and how an exhibition or other product can have both a physical and an online presence.
- Awareness of some of the technology that makes the modern web work.
- Increased confidence and motivation to learn more about computer science.

What do I do?

As your students enter **Web Lab** they'll get a Lab Tag with a unique pictogram (see 'Lab Tag Explorer' resource). With this Lab Tag they can collect their creations – we call them artefacts – from each experiment and investigate them further at home or at school. There are a number of artefacts, such as pictures, videos and sounds, to collect from each of the five experiments within **Web Lab**. When the students get home or back to school they simply need to visit the website **chromeweblab.com** and hold their Lab Tag up to their webcam or enter their unique code. They'll then be able to access all of their personalised artefacts.

What can we discuss?

- You are an inventor; you have just invented the internet. How would you sell your idea?
- How has web technology affected our lives? What would change in your life if all web technology were taken away?
- Create your own 'smart' appliances. What object in your house would you like to connect to the internet and how would this change how you could use it?
- What will the internet look like in 50 years' time?
- Write your own guide for someone who doesn't know how to use the internet.
- Each day 620 million people (that's 10 times the population of the UK) visit Google. Could the internet become its own country? How would it be run? Who would be in charge?
- What other things have you come across bar codes, QR codes that are like Lab Tags? Why are they so useful?

Web Lab Museum links

Punch card office

Computing and Mathematics, second floor

This machine was designed to make calculations for accounts easier by doing them automatically. The machine reads the pattern of holes in the punch cards to transfer accounting data.

Computers today use a similar system of languages and protocols to send information or data.

Phillips economics analogue computer

Computing and Mathematics, second floor

In a computer data moves around a system. In this system the data is made of water rather than electronic signals.

Cooke and Wheatstone's double-needle telegraph

Telecommunications, first floor

This telegraph was one of the first ways that people communicated with each other using machines connected by a cable.

With a telegraph like this you could either send or receive a message, but not do both at once. Nowadays web sockets allow us to send and receive messages at the same time.

Three-ringed Enigma cipher machine

Codebreaker: Alan Turing's Life and Legacy, ground floor mezzanine (until July 2013)

This machine took messages and encrypted them so they could not be read by anyone who didn't know the code.

Computers also encode or encrypt the information they work with, though not always to be secretive. Sometimes it's just because computers are better at handling some types of information than others.

Atari home computer

The Secret Life of the Home, basement

Old computers weren't as good at dealing with graphics as today's models, that's why the graphics on this computer look very basic.

To send high-quality files and photos over the internet we've learnt how to compress files so they still contain great amounts of detail but aren't so large and difficult to move around.

Codebreaker: Alan Turing's Life and Legacy

(until July 2013)

Codebreaker is an exhibition developed by the Science Museum to celebrate the centenary of the birth of Alan Turing, a British mathematician and computing pioneer.

Alan Turing is most widely known for his critical involvement in the codebreaking at Bletchley Park during the Second World War.

Museum web links

chromeweblab.com

Use this site to find out more information about the gallery and to access the artefacts your students collected on gallery.

sciencemuseum.org.uk/visitmuseum/galleries/turing.aspx

This site accompanies the Science Museum's *Codebreaker* exhibition about Alan Turing.

sciencemuseum.org.uk/weblab

On gallery there are several animations used to introduce data packets, databases, web sockets, languages, protocols and compression. These videos are available for use in the classroom.

External web links

khanacademy.org

Video lessons covering many computer science topics.

codecademy.com

A set of exercises which act as an introduction to coding.

bbc.co.uk/schools/gcsebitesize/ict

A series of revision topics and activities related to the internet and networks.