STEM from HOME

Cyber security

Cyber security is the way in which people or businesses protect their personal information and other data from being stolen by cyber criminals.

Cyber security protects the devices that we use such as phones and laptops through securities that include software and passwords. It also protects the services that we access online such as social media and online banking, preventing unauthorised access. From making pictures on Instagram private, to keeping emails secure, cyber security has become a huge part of modern life and it is important that we all understand and use it correctly.

With more than 1,700 cyber security experts, CGI certainly knows a thing or two about staying safe online!

Cyber coding

Secret agent chat

In this activity, you will learn how to create and use an encryption technique known as the 'one-time pad'. This method of encryption will allow you to send secret messages to your friends.

Secret messages

In this activity, you will learn how to make your own encryption program, to send and receive secret messages with a friend. This project introduces iteration (looping) over a text string.

Password generator

It is important to protect your personal information online, and in this project you'll create a program to generate passwords for you. The passwords will be random, so no one will be able to guess them!

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Cyber research project

This research project looks at the different types of cyber threats, the types of cyber security that work to protect against them and some actions that you can take to stay cyber safe!

What are the biggest cyber threats that we face? Read through a few examples below and fill in the blanks:

Threat	Description
Social engineering	Cyber criminals convince people to give away information, often through scam emails
APTs (advanced persistent threats)	
Malware	Software that is designed to damage or gain access to a computer system
Ransomware	

Can you name five more cyber threats?

Threat	Description

There are many types of cyber security that work to protect against cyber threats. Can you match the threats below with their descriptions?:

Threat	Description
Critical infrastructure security	Protection of physical and digital data from unauthorised access and use
Network security	A good way to ensure that everyone operates safely online is through education! Users need to be made aware of what the threats are and how to protect against them
Application security	Software that protects and monitors data that is based in the cloud
Information security	Cyber-physical systems protecting important infrastructure such as electricity grids and water purification systems
Cloud security	Use of hardware and software to defend against external threats, examples include antivirus programmes, firewalls and encryption
Data loss prevention	Protects internal networks from intruders, this is often done through two-factor authentication and use of strong passwords
End-user education	Developing policies and processes for handling and preventing the loss of data

What can I do to protect against these cyber threats?

Regularly back up your files
If you need to wipe your device clean in the event of a cyber-attack, you will still have access to your files, stored separately in a safe place.

Only use trusted websites
Only use trusted websites when providing personal information. Even then, ask yourself, do I need to be giving out this information? If a site includes ‘https://’ then it is a secure site.

Do not open attachments or links from unknown senders
One of the most common ways for users and networks to become exposed is through malware and viruses being sent in emails. Only open links in emails from known contacts.

Keep your devices updated with the latest software
Always having the latest software updates will ensure that you are protected against the latest threats. Cyber criminals often target outdated devices.

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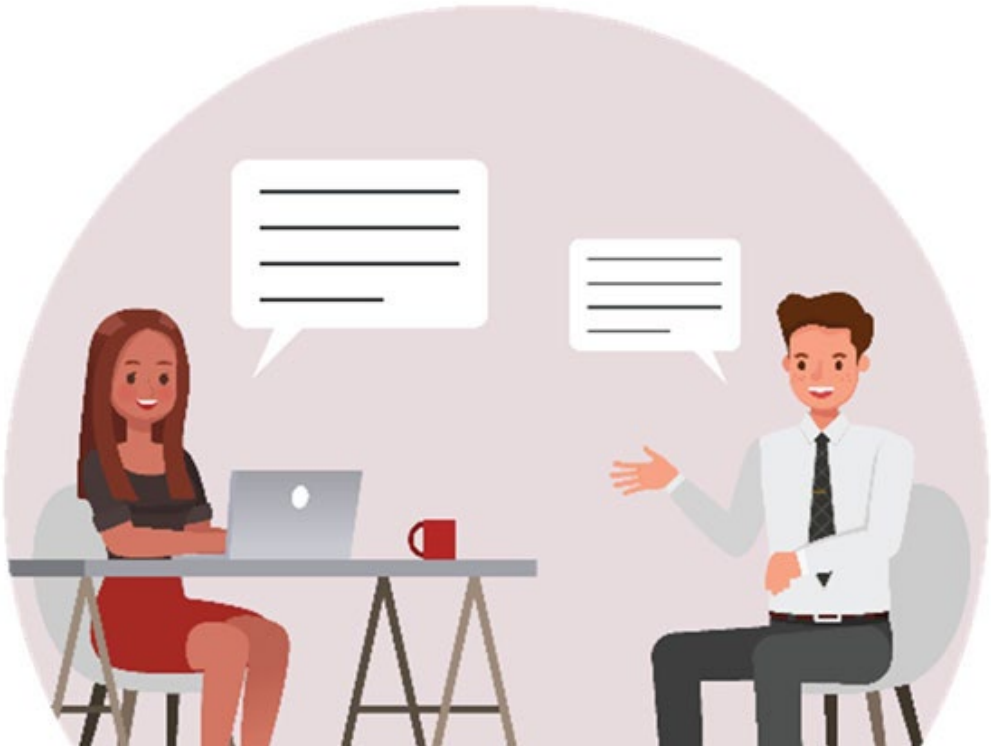
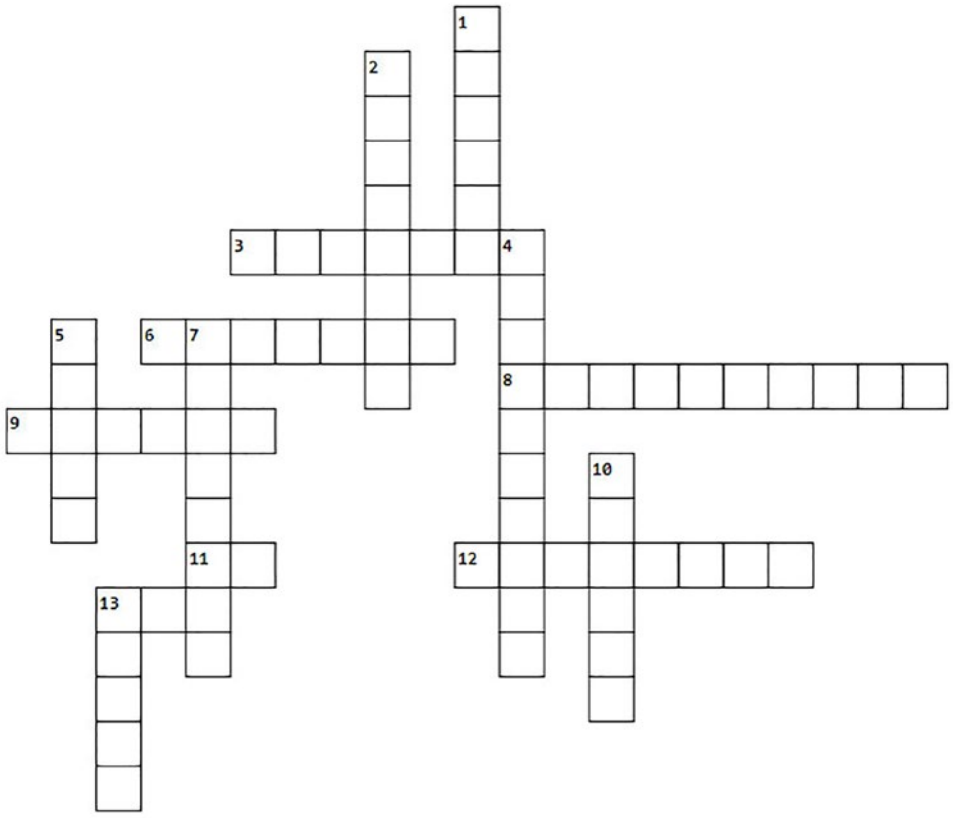


Cyber crossword

Learn the meaning of some key cyber security terms with this cyber crossword! Use a combination of your existing knowledge and research to crack this task.

Across	Down
3. Software that is designed to disrupt, damage or gain unauthorised access to a computer system	**1.** An individual that uses computers to gain unauthorised access to data or systems
6. A type of malware designed for spying on user activity without their knowledge	**2.** A set of programs that tell a computer to perform a task
8. A form of malware that holds data hostage, typically encrypting files and demanding that a ransom be paid so that the data can be recovered	**4.** The process of encoding data to prevent theft, making it only accessible with a key
9. A group of computers, printers and other devices that are interconnected and governed as a whole	**5.** Technology that allows you to access files and services through the internet from anywhere in the world
11. An internet address for your computer, which is identified when communicating over a network	**7.** A technique used by hackers to try and obtain sensitive information, often through emails
12. A defensive technology designed to prevent unauthorised access to a network or system	**10.** The moment a hacker successfully gains access to a computer or other device
13. A tool that allows users to remain anonymous while using the internet by masking their location and encrypting traffic	**13.** A type of malware that aims to corrupt a computer before spreading to others



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CGI's top cyber security tips

Be unique

Create distinctive online passwords, start with numbers and use characters. Hackers expect passwords to start with a capital letter! Never share your password or store it on your device. Use different passwords for different websites and apps.

Stranger danger

People online are not always who they say they are. Do not share information with someone online if you would not tell a stranger on the street. This includes sharing details that might reveal where you live.

Picture perfect

It's great to share photos with friends and family. Make sure your privacy settings are high to limit them to your chosen audience. Remember, once a picture is online, it's not just yours anymore, so think about what and how you post.

Think before you click

It's easy to get caught out by links or attachments, some of which may use your real contact information, or appear to be sent from friends. Think carefully before reacting to links, unexpected emails or requests for information.

Download carefully

A top goal of cyber criminals is to trick you into downloading malware, programs or apps that carry malware or try to steal information. Only download programs or content from trusted sources.

Trust your instincts

If you see something online, are asked for information, or to behave in a way that makes you feel uncomfortable, unsafe or worried, leave the website and tell someone you trust.

Create your own online safety poster

Now that you are a cyber security expert, use what you have learned so far and your own research to design a poster to let children know your top tips for staying safe online!

You can hand-make your poster or create it virtually using Word or Raspberry Pi's 'wanted' activity.

Be sure to include at least 5 tips, adding images and plenty of colour!

Ask your parent/guardian to upload pictures of your STEM creations to **Twitter**, **LinkedIn** or **Facebook** using **#STEMfromHome** and **#ExperienceCGI**, remember to tag us!

For more information or additional support with STEM activities when working remotely, contact **enquiry.uk@cgi.com**