


**TOPIC: Fundamentals of cyber security: Methods to detect and prevent cyber security threats**

**LEARNING OBJECTIVES:**

- What is a security measure?
- CAPTCHA
- Biometric security measures
- Password systems
- Automatic software updates

	<b>Teacher Activity</b>	<b>Pupil Activity</b>
<b>Starter activity</b>  (5-10 mins) [individual/ paired or group]	What is a security measure?  Types of security measures	Discuss (individual/ paired or group)  What is a security measure?  Name types of security measures


<p><b>Main activity one</b> (15 mins)</p>	<p><b>CAPTCHA</b></p> <p>What is CAPTCHA? What does CAPTCHA stand for?</p>  <p><i>Stands for <b>Completely Automated Public Turing Test To Tell Computers and Humans Apart</b></i></p> <ul style="list-style-type: none"> <li>• <i>Humans can read disfigured words and character, computers cannot.</i></li> <li>• <b>What is it?</b> CAPTCHA is a program that challenges a user's response to determine if they are human or computer.</li> <li>• <b>What is it used for?</b> This protects against malicious activity caused by automated programs accessing a site. Unless you can enter the text from the picture/ carry out an action, you are unable to access the website.</li> <li>• <b>What types of programs use it?</b> Security checks for most websites, banks, social networking, and ballots.</li> </ul> <p><i>Why is this good security?</i></p> <ul style="list-style-type: none"> <li>• Computer programs can't pass it</li> <li>• You can bombard a site (attacks) by spam</li> </ul> <p><i>Negative points?</i></p> <ul style="list-style-type: none"> <li>• <i>Makes it longer for you to get on a site (annoying)</i></li> <li>• <i>People with visibility problems might not be able to see</i></li> </ul> <p><b>Email confirmation</b></p> <p><i>Did you receive an email to confirm that was your real email address?</i></p> <p><b>What is it?</b> <i>It's a security measure to confirm someone's identity to confirm an account.</i></p> <p><b>What's it's used for?</b> <i>To ensure you are who you say you are, a real person and stop fraud, form of verification</i></p> <p><b>What programs use it?</b> <i>Anything where you would create an account online that has personal information and put in an email address.</i></p> <p><b>Activity</b></p> <p><i>Watch a video of someone verifying there account</i></p> <p><a href="https://www.youtube.com/watch?v=2C3ZjqnqJ_w">https://www.youtube.com/watch?v=2C3ZjqnqJ_w</a></p>	<p>Discuss (individual/ paired or group)</p> <p>What is CAPTCHA? What does CAPTCHA stand for?</p> <p>Where have you seen CAPTCHA's?</p> <p>Discuss the good and negative aspects of CAPTCHA's</p> <p><b>Practical activity</b></p> <p>To try out a CAPTCHA</p> <p><a href="https://www.funcaptcha.com/demo/">https://www.funcaptcha.com/demo/</a></p> <p><b>Questions for discussion?</b></p> <p>Have you signed up for anything online (social networks? Anything with an account)?</p> <p>Did you have to use an email address?</p> <p>Did you receive an email to confirm that was your real email address?</p>
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<p><b>Plenary one</b> (5-10 mins)</p>	<p><i>Assess learning against the learning objectives</i></p> <ul style="list-style-type: none"><li>• <i>This is an open activity whereby the teacher will decide on the best approach to do this based on the pedagogical approach your school takes on assessment.</i></li></ul>	<p><b>For example:</b></p> <ul style="list-style-type: none"><li>• 5 minute timed writing exercise on what has been learned so far</li><li>• Fill in class notes</li><li>• Have a discussion</li><li>• Answer open questions</li><li>• Answer directed questions</li></ul> <p>On: CAPTCHA and Email confirmation</p>
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<p><b>Main activity</b> two (15 mins)</p>	<p><b>Biometric security measures:</b></p> <p><b>What is it? Biometric security</b> devices <b>measure</b> unique characteristics of a person. With <b>biometrics</b>, it can make it extremely difficult for someone to break into a system.</p> <p>Examples of unique characteristics of a person:</p> <ul style="list-style-type: none"> <li>• Voice pattern</li> <li>• The iris or retina pattern of the eye</li> <li>• Finger print patterns.</li> </ul> <p><b>What is it used for?</b></p> <ul style="list-style-type: none"> <li>• Mobile phone entry e.g. iPhone</li> <li>• Building access</li> </ul> <p><b>Bank account access</b></p> <p><b>Resources:</b></p> <ul style="list-style-type: none"> <li>• Video on ePassport facial recognition gates at airports (<a href="https://www.youtube.com/watch?v=i6AVF0GhxNk">https://www.youtube.com/watch?v=i6AVF0GhxNk</a>)</li> <li>• <a href="https://www.nidirect.gov.uk/articles/using-epassport-gates-airport-border-control">https://www.nidirect.gov.uk/articles/using-epassport-gates-airport-border-control</a></li> </ul> <p><b>Password systems</b></p> <p><b>What are they?</b></p> <p>A password is a secret word or phrase that must be used to gain admission to a place. Passwords are considerably harder to crack if they are not words from the dictionary and have a sizeable length.</p> <p><b>What are they used for?</b></p> <p>Password systems are implemented in nearly all devices/buildings/software tech to enable a particular person to gain access.</p> <p><b>Automatic software updates</b></p> <p><b>What is it?</b></p> <p>Where your computer automatically checks for and updates its software to latest version.</p> <p><b>Why is it important?</b></p> <p>Where viruses and attack methods are always evolving it is incredibly important to have your software applications updating as these recent update may contain new bits of code which can defend against the new viruses of today. Not having your software updated means that it may be vulnerable to weaknesses that have been patched by updates</p>	<p>Discuss (individual/paired or group)</p> <p>What is biometric security measures?</p> <p>Mix and match security measures and if they are biometric or other.</p> <p><b>Practical activity:</b></p> <ul style="list-style-type: none"> <li>• Setting up fingerprint access on a phone with the class (for multiple users).</li> </ul> <p><b>Practical activity:</b></p> <ul style="list-style-type: none"> <li>• Visit to the network manager talking about password management.</li> </ul> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Go around asking what software you have that could be vulnerable because you have not updated.</li> </ul>
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<p><b>Plenary two</b> (5-10 mins)</p>	<p><i>Assess learning against the learning objectives</i></p> <p><i>This is an open activity whereby the teacher will decide on the best approach to do this based on the pedagogical approach your school takes on assessment.</i></p>	<p><b>For example:</b></p> <p>5 minute timed writing exercise on what has been learned so far</p> <ul style="list-style-type: none"> <li>• Fill in class notes</li> <li>• Have a discussion</li> <li>• Answer open questions</li> <li>• Answer directed questions</li> </ul> <p>On: Biometric security measures, password systems and automatic software updates</p>
<p><b>Homework (optional)</b></p>	<p><i>Teacher choice based on homework policy of school.</i></p>	<p><b>For example:</b></p> <p>Find a site with a CAPTCHA on and then explain what happens (used screen shots)</p> <p>See above</p>

Key Terms:	
<p><b>CAPTCHA</b></p>	<p>Stands for <i>Completely Automated Public Turing Test To Tell Computers and Humans Apart</i></p> <ul style="list-style-type: none"> <li>• Humans can read disfigured words and character, computers cannot.</li> <li>• <b>What is it?</b> CAPTCHA is a program that challenges a user's response to determine if they are human or computer.</li> <li>• <b>What is it used for?</b> This protects against malicious activity caused by automated programs accessing a site. Unless you can enter the text from the picture/ carry out an action, you are unable to access the website.</li> </ul> <div>  </div> <ul style="list-style-type: none"> <li>• <b>What types of programs use it?</b> Security checks for most websites, banks, social networking, and ballots.</li> </ul>
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