3.6 Fundamentals of cyber security

3.6.1 Cyber security threats

Lesson plan and printable activities

Materials needed

1. 3.6.1 Lesson PowerPoint.
2. Starter activity cards.
3. Cyber security threat worksheet.

Starter activity (~5 minutes)

1. Slide 2: Activity – Silent card sort
   Students are divided into pairs – cards should be cut up before hand. In silence they should rearrange the words into the correct order to create a definition of cyber security.
   
   Differentiation: Students could be given the start of the definition or part of the sentence and fill in the missing words as an easier alternative.
   
   Extension: If students finish early, get them to mind map ideas they have for cyber security threats.

2. Slide 3: Answer to silent card sort.

3. Slide 4: Discussion and questions leading into the topic.

Main activities

1. Slide 5: Introduction to the objectives of the lesson.
   
   Slide 6: Cyber security threats that students need to know about are listed. There is a breakdown of the threats in the notes section of the PowerPoint, with some supporting links.
   
   Alternatives: Depending on ability of class, the teacher may wish to discuss the threats with the class, or get them to independently research them – completing the Cyber security threats worksheet on slide 10. They may also complete aspects of it during the activity on slide 8.

2. Slide 7: Video on cyber security www.youtube.com/watch?v=sdpxddDzXfE

3. Slide 8: Link to a game about cyber security following on from the video.
   www.pbs.org/wgbh/nova/labs/lab/cyber/
   
   Assessment opportunity: Differentiated levels to work through in the interactive game. Gives an example of defending a company against cyber criminals and attacks. Students can log in to this site, so it is possible for them to work further on it at home/outside of the lesson if so desired.
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4. **Slide 9**: Information on penetration testing.

5. **Slide 10: Cyber security threats worksheet**

   Depending on class ability and teacher preference, students can record findings from the game – as stated above, it could be introduced at slide 6, or they could research and complete independently.

   **Alternative**: the worksheet could be completed as a homework task to consolidate the learning.

**Plenary (5 minutes)**

1. **Slide 11: Activity - 3,2,1**

   This can be done in groups or individually:

   - Identify:
     - 3 categories of cyber security threats
     - 2 examples of cyber security threats
     - 1 reason for penetration testing.
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3.6.1 Cyber security threats

Lesson

Start

Start activity

In pairs...
- Using the cards, arrange the words into a definition of ‘cyber security’.
- You have three minutes to complete the task, but you must not speak to your partner!

TIME UP

Start activity: Answer

Cyber security is:

Protecting networks, computers, programs and data from attack, damage or unauthorised access through the use of technologies, processes and practices.

Discussion

- Did you guess correctly?
- What threats would organisations have to protect themselves from?
- Can you think of examples of cyber security threats?
- In what ways could cyber security threats be eliminated or reduced?

Objectives

Understand and be able to explain cyber security threats.

Explain what penetration testing is and what it is used for.

Cyber security threats

- Social engineering techniques
- Malicious code
- Weak and default passwords
- Misconfigured access rights
- Removable media
- Unpatched and/or outdated software

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Penetration testing

A company will identify weaknesses in their computer systems by attempting to hack into it as if they were a real cyber criminal. This can also include checking for threats from use inside of the company.

It allows a company to prevent loss and identify potential exploitation before it happens for real.

Activity

Complete the cyber security threats worksheet.

Plenary

3,2,1

Identify:
• 3 categories of cyber security threats
• 2 examples of cyber security threats
• 1 reason for penetration testing.
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#### Starter activity cards

<table>
<thead>
<tr>
<th>Protecting</th>
<th>networks,</th>
<th>computers,</th>
<th>programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>and</td>
<td>data</td>
<td>from</td>
<td>attack,</td>
</tr>
<tr>
<td>damage</td>
<td>or</td>
<td>unauthorised access</td>
<td>through</td>
</tr>
<tr>
<td>the</td>
<td>use</td>
<td>of</td>
<td>technologies</td>
</tr>
<tr>
<td>processes</td>
<td>and</td>
<td>practices.</td>
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</tr>
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</table>
### Cyber security threats worksheet

<table>
<thead>
<tr>
<th>Cyber security threat</th>
<th>Explain the threat</th>
<th>Example of the threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social engineering techniques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malicious code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak and default passwords</td>
<td></td>
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</tr>
<tr>
<td>Misconfigured access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removable media</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unpatched and/or outdated software</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### What is penetration testing?

- **What is it used for?**

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