




Networked systems

	Age group	13 and above
	Time	30 - 60 mins
	Subject	Computing



National Curriculum links

This activity would suit KS4 students or the top end of KS3.

The national curriculum for computing for key stages 3 and 4 aims to ensure that all pupils “*can analyse problems in computational terms*” and “*are responsible, competent, confident and creative users of information and communication technology.*”

England Key stage 3 subject content

Pupils should be taught to:

- understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems

England Key stage 4 subject content

Pupils should be taught to:

- develop their capability, creativity and knowledge in computer science, digital media and information technology

Learning outcomes

Pupils should be able to:

- Describe how to improve the digital infrastructure for a business.
- Describe the digital security threats to a company and how these can be reduced.
- Consider the impact on staff when introducing new digital infrastructure to a business.

Skills developed

- **Decomposition:** Breaking a bigger problem down into smaller more manageable sections.
- **Abstraction:** Removing unnecessary details to focus on the key parts.
- **Communication:** Sharing thoughts with others on how they arrived at their solution.
- **Collaboration:** Working with others to discuss the problem.

Requirements

Students will need access to computers and the internet to complete this task.

Overview of 'Networked systems'

This task can be used as a real-world example to help learners understand the different hardware components needed to develop a networked system and the associated security implications. It also asks learners to consider the impact of technological change on company employees.

Logistics companies are moving towards using technology in all areas to streamline processes and improve customer service. This will improve a company's productivity and profitability. Information technology (IT) or digital manager roles can vary. In some cases, an IT manager will be responsible for the initial set up of digital systems. In other roles they may have to manage and maintain digital systems after they have been installed.

Most companies have a plan for the integration or development of IT systems and technology which is drawn up after the initial assessment of the company's needs. In this scenario learners are introduced to an IT plan for a logistics company.

Resource Overview

This resource includes these items:

- Teacher notes.
- Student activity sheet setting out the task and giving the information required for the students. This includes separate sheets containing the information needed by each group.
- Exemplar responses which teachers may use to support groups of students who need some scaffolding to get started.
- Presentation slides to help explain the tasks.

The context

Simone has started as an IT manager at a logistics company. Her role is to manage the digital systems in the company.

Currently the company has stand-alone computers in each of the offices and uses paper for inventories and deliveries.

Simone has developed a digital improvement plan and now needs to investigate how she can implement it.

Simone's IT improvement plan:

- connect all the computers to create a network
- use barcodes and barcode readers to track stock movements in and out of the warehouse
- set up a central database of stock items
- install a wireless network connection in the company's building so additional devices can connect to the network
- ensure the IT system is secure

The task

Split the class into 5 groups. Each group is allocated one of the areas listed below to research. Each group uses a provided worksheet with questions they need to answer and useful websites to help with the research. Finally, each group will feed back their findings to the wider group.

The areas to be researched are:

1. Creating a network of computers
2. Using barcodes and barcode scanners
3. Installing a wireless network
4. Network security
5. Considering the staff

Supporting notes

Give each group a copy of page 1 of the student activity sheet and the relevant allocated group task.

Useful websites

Networks:

- [BBC Bitesize – Introduction to networks](#)
- [BBC Bitesize – Computer networks and topologies](#)

- [Isaac computer science – network basics](#)
- [Isaac computer science – network topologies](#)
- [Isaac computer science – network hardware](#)

Barcodes and scanners:

- [BBC Bitesize – Inventory management](#)
- [BBC Bitesize – Barcode reader](#)
- [Isaac Computer Science – Input devices](#)

Installing a wireless network:

- [Isaac Computer Science – Wired and wireless networks](#)
- [BBC Bitesize – Wired and wireless networks](#)

Network Security:

- [Isaac Computer Science – Network security](#)
- [BBC Bitesize – Network security](#)
- [BBC Bitesize – Network security - Forms of attack](#)

Considering the staff:

- [BBC Bitesize – Impact of digital technology on employment](#)

(Please note - to use the free Isaac Computer science website, users need to register:

<https://isaaccomputerscience.org/>)

Generation Logistics Education Hub

This resource is one of the many engaging resources available from Generation Logistics on their Education Hub. For more details go to: www.educationhub.generationlogistics.org/