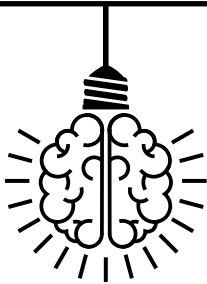




# Learning notes

Explore three of the key stories



Discover ideas, activities and opportunities to learn more about the science and technology covered in this edition of Catalyst magazine.

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**GENERATION LOGISTICS™**



## Learning notes

For Students

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### Careers logistics and developing key skills

Linked Article: **All articles**

This edition of Catalyst Magazine looks at the use of logistics within big businesses - the technology and skills that are needed to ensure the successful outcome of customer satisfaction. So what do we mean by 'logistics' and how does it relate to STEM subjects and associated careers?

Logistics is about getting the right things to the right place at the right time, and at the right price. As such, effective logistics professionals are adept at planning, flexibility and problem solving, which are assets in any career. Monitoring the supply chain from start to finish, calculating risks, and problem solving throughout the process is essential – and requires many roles with various entry points to make this feat successful.

To provide an example that will be familiar to many: clothing. Planning, sourcing, making and delivering are the primary stages of the logistics process – and yet customers often only consider that end stage, when our garment reaches the store or our door. Roles in engineering, technology, that use maths and geography and more are in abundance in this often-hidden sector. The considerations of sustainability and innovation are increasingly prominent, making logistics a sector in which the next generation can really make a change.

#### Learning Task:

Develop your logistical planning skills.

Start by thinking about how you spend your time over the course of a day and then a week. Make a note of the main aspects, the time you spend on each and the resources needed to ensure each task is successfully achieved.

Your task is to plan how your time will be spent over the next two weeks.

1. Create a digital method to monitor the logistics of your life. This could be a Gantt chart, Excel spreadsheet, Word table, phone app etc.
2. Define key topic areas and allocate aspects within them, such as: Education - lessons, homework, after school clubs, study periods; Entertainment - music, reading, gaming, tv; Social interaction – family, friends, work; Personal - eating, hygiene, sleeping; Travel - purpose, method, resources (e.g. car and driver) etc.
3. Consider the resources needed to support each aspect. Is there a financial commitment required by you or the resource? How does the loss or unavailability of a resource impact, and what alternatives can be used?
4. Allocate expected time spent and include a section for actual time spent.
5. Monitor over the course of the first week, noting when tasks required more or less time than anticipated, when an aspect didn't go to plan and the solution you applied.
6. Adjust the second week based on your knowledge from week one.

Reflect on the two weeks - did anything surprise you, what would you do differently, how much of your life impacts and is influenced by others? Consider how the

planning and logistical skills can be used to support your education and future career path. Can you use your knowledge to support your life so that you are in control, know what you want to achieve and can plan accordingly?

### **Take your learning further:**

Research logistics and planning skills and find ways to enhance your skills. Are there courses or resources that can help you develop them? Practice by planning small aspects of your life, working towards the bigger ones, make it part of your daily life so it is natural to you. Whether you intend to go to university, do an apprenticeship or seek employment, knowing how to plan your time and be resilient to change will ensure a successful outcome whatever path you take.

Explore career opportunities, research what an employer seeks in their employees, and what skills and personal attitude they are looking for. Can you develop the skills they need and highlight your use of them? Every industry, role, job, and career use logistics, so being well versed in effective planning, and understanding not only the concept but the ramifications, will support you throughout your chosen career.

Work individually or in teams to create an amazing 'Party in the Park' for you and friends. Explore the logistical issues to consider and create the perfect event: <https://educationhub.generationlogistics.org/resources/>

The following sites have great careers information:

- For students - [Generation Logistics Careers Information](#)
- For teachers - find excellent curriculum-relevant lesson plans and activities at: [Generation Logistics Education Hub](#)

- <https://www.youthemployment.org.uk/careers-hub-sector/transport-logistics-jobs/>
- <https://ciltuk.org.uk/Careers/Careers-Information/Career-Profiles>
- <https://www.careerpilot.org.uk/job-sectors/logistics/useful-links>

### **Find out more:**

Visit the following career links:

- [Careers with Asda](#)
- [Careers with CEVA Logistics](#)
- [Careers with DHL](#)
- [Careers with GXO](#)
- [Careers with Maersk](#)
- [Careers with Marshall Fleet Solutions](#)
- [Careers with Prologis](#)
- [Careers with Wincanton](#)





## Learning notes

For Teachers

2

### Life cycle assessments

Linked Article: **All articles**

Road transport of raw materials, and the product that is made from it, can be an important consideration when doing a Life Cycle Assessment (LCA) on a product.

If a product is an awkward size or made of a very heavy material like glass, this may mean it is more difficult to transport large amounts easily, meaning more vehicles, and therefore fuel, used. If a raw material is made or processed far away from where the product is produced this can add an environmental impact through transporting the materials to the factories where they are needed. Most lorries still use diesel from crude oil sources as their main fuel, which has an impact on the environment.

#### Learning Task:

This task should be sequenced after covering the environmental effects of key pollutant gases such as carbon dioxide, sulfur dioxide and nitrogen oxides in the GCSE chemistry curriculum.

1. Using the materials from 'Death to Diesel' downloadable from: <https://www.stem.org.uk/rxesq9>, investigate the products of combustion of diesel on health.
2. Ask students to include information on effects to the environment and then rank how serious those issues are for each category e.g. one gas could not have a major impact on health, so is the number 5 health concern, but has a very major impact on the environment, so is number 1 for this area. The vlog

can then include both aspects of the environment (included in LCAs) and health (not included in LCAs). It is important to stress at this point that we are concentrating on the environmental impact as cost is not a consideration in life cycle assessments.

#### Take your learning further:

GCSE CHEMISTRY - What is Biodiesel? - What are the Advantages of Biodiesel? - What are the Disadvantages of Biodiesel? - GCSE SCIENCE.

Encourage the students to look up further information and use their research to consider the following questions to provide a considered case for increasing the use of biofuel or alternative methods to aid in the transport of goods:

- Would this improve the environmental impact of the lorries that are used?
- How are the gases different?
- What other forms of viable fuel sources are there? Are there any emerging fuel sources that may revolutionise transport in the next 30 years with minimal impact on the environment?

Ask the students to produce a new ranking for biodiesel and compare with diesel from crude oil.

## Find out more:

- This video has some interesting work from scientists looking at the production of biofuels: <https://www.stem.org.uk/rx329f>
- This video from Twig World explores using vegetable oils as fuel: <https://www.stem.org.uk/rx34c9>
- This collection of resources explores fuel cells and biofuels: <https://www.stem.org.uk/resources/community/collection/16151/fuel-cells-and-biofuels>
- This report from the House of Commons looks at the recommendations for fuelling the future: <https://publications.parliament.uk/pa/cm5803/cmselect/cmtrans/159/report.html>
- The European Union has the following information on alternative fuels: <https://alternative-fuels-observatory.ec.europa.eu/general-information/alternative-fuels>
- The US Department of Energy has useful information on alternative fuel sources used in transport: <https://afdc.energy.gov/fuels/>
- Fuelmate: <https://fuelmate.co.uk/alternative-fuels-for-vehicles/>



## Learning notes

For Teachers

3

### Deal or no deal?

Linked Article: **All articles /Inside Black Friday**

Is Black Friday an opportunity to save money or a clever marketing trick?

With the help of AI, chaotic scenes of people scrambling for goods in-store might just be a thing of the past, but Black Friday might not be the cheapest time to grab a bargain.

How can you be sure that when you are buying a product you are getting good value for money?

#### Learning Task:

Ask students to find the value of one item, if:

- 5 apples cost £1.50 (30p each)
- 6 bananas costs £1.20 (20p each)
- 3 cucumbers £2.25 (75p each)

Then ask which of the following options is the best value for money:

- Shop A: 1kg of apples for £3.34
- Shop B: 700g for £2.20

Discuss which is the better value and how they know this. Discuss how they found their answer - is there more than one way? Either method – either by calculating the cost per gram (or kg), or alternatively finding the amount of apple per pound (A is 299g/£, B 318g/£ (to 3s.f.) – will work. Which do they prefer?

Other examples include:

**Toilet roll:**

9 pack - £4.68

4 pack - £2.32

#### Milk

1 pint - 90p

4 pints - £1.45

6 pints - £2.15

More questions of this kind can be found below.

Discussion: why can “bulk buying” often be cheaper? Are there examples when you wouldn’t purchase the ‘best buy’ option? Why?

Extension puzzle: In a sale, there is 10% off all items. You also have a member discount card which gives you 15% off all purchases. At the till, the cashier asks which discount you would like to be applied first. What do you say?

#### Take your learning further:

Work out which are the best buys for items sold in different-sized packs at different prices with this resource from our Nuffield Mathematics collection (<https://www.stem.org.uk/rxfz8>).

More money management resources – covering content that is roughly equivalent to Foundation Level GCSE or Level 1 Functional Mathematics – from the Nuffield Foundation (including invoices, interest, VAT and bank balances) can be found here: <https://www.stem.org.uk/cxg28d>

## Take your learning further still:

Explore this 'Value for money' collection from dy/dan that bring mathematical storytelling to the classroom through real-world examples.

Each lesson idea includes three acts:

- Act One: a video or photograph to provide a 'hook'
- Act Two: further relevant information to help solve the problem
- Act Three: a further video, graph or photograph that resolves the problem

Explore rip-off petrol stations, pain relief, showers vs baths and more here: <https://www.stem.org.uk/cxexrd>

## To find out more:

There is a wealth of support and guidance for young people and teachers interested in money and finance education. Try these:

- Young Enterprise <https://www.young-enterprise.org.uk/teachers-hub/financial-education/financial-education-programmes/>
- Barclays Life Skills <https://barclayslifeskills.com/help-others/blog/building-financial-literacy/>
- The Careers and Enterprise Company <https://resources.careersandenterprise.co.uk/resources/financial-education-guidance-schools-england-and-scotland>
- Money Saving Expert - Your Money Matters textbook <https://www.moneysavingexpert.com/family/financial-education/>



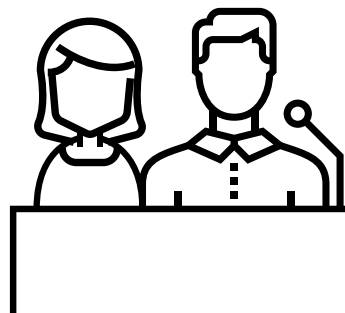
## Meet our authors and 1000's of inspiring STEM role models like them!

Many of the Catalyst authors are volunteers in the STEM Ambassadors programme.

STEM Ambassadors are inspiring volunteers from industry and university, situated across the UK who can support young people and educators by providing talks, mentoring and engaging STEM activities.

For example, you could request a STEM Ambassador to:

- Provide an online talk for your class
- Judge a STEM competition in your school or college
- Attend a parents evening and talk about careers linked to STEM subjects



- Run a practical activity for a STEM subject club

Bring the power and inspiration of STEM Ambassadors to your classroom, free of charge:

- Visit the STEM Ambassador website ([www.stem.org.uk/about-us/our-network/sah](http://www.stem.org.uk/about-us/our-network/sah))
- Use the STEM Ambassador app (search STEM Teacher on your app store).



You can reach out to our STEM Ambassador Partners across the UK: [www.stem.org.uk/about-us/our-network/sah](http://www.stem.org.uk/about-us/our-network/sah)

The Generation Logistics Ambassador Network is a collective of passionate employees who help to enthuse the next generation of logistics recruits by sharing their stories and the opportunities they took advantage of. Ambassadors spread the logistics message across schools and colleges, through careers talks, site visits, classroom activities and more. For more information, or to request engagement from the Generation Logistics Ambassador Network, please contact:

[generationlogistics@logistics.org.uk](mailto:generationlogistics@logistics.org.uk)

## GENERATION LOGISTICS™

## Thank you

We hope you enjoyed Catalyst, and matching learning notes. If you have any feedback, or ideas for topics you'd like to see covered in future editions, please email:

[catalyst@stem.org.uk](mailto:catalyst@stem.org.uk)



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