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**Academic Research Competition**

**Student Workbook**

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# Introduction

We would like you to complete a piece of independent research on a STEM-related topic and then record your research as a voiceover for an information video.

THIS IS A COMPETITION!

Winning students will have their voiceover added to a STEM subject video to be shared with your school!

# Quiz: What is it like to study STEM subjects at A Level?

|  |  |  |
| --- | --- | --- |
| **Question** | | **Answer** |
| **1.** | **You might choose to study this subject if:**   * You’re interested in the world, plants, animals and people around you * You enjoy finding out how things work * You enjoy conducting research and carrying out experiments * You enjoy problem solving * You have strong mathematical and analytical skills * You might also choose to study this subject if you’re considering a career in healthcare, medicine or jobs involving plants or animals. |  |
| **2.** | **Which subject is this?**  This is the study of matter, its properties, how and why substances combine or separate to form other substances, and how substances interact with energy.  It is sometimes called “the central science” because it bridges physics with other natural sciences, such as geology and biology.  Experts in this field conduct experiments to study how elements work in different conditions, test how they mix, and work out what they are made up of right down to the tiniest particle. They use their experiments and knowledge to develop medicines, foods, fabrics and other materials, from neon lights to shatterproof glass.  They also use it to understand the world around us, from why leaves change colour to discovering invisible pollutants in the air. |  |
| **3.** | **You might choose to study this subject because:**   * You are interested in learning how computers work * You enjoy problem solving and using logical reasoning * You have strong mathematical skills * You enjoy thinking creatively and innovatively |  |
| **4.** | **Which subject is this?**  This is the study of numbers, shapes, space and measurement, and numerical systems, symbols and rules.  Studying this subject will help us find patterns and structure in our lives. It helps us put a price on things, create graphics, build websites, build skyscrapers and generally understand how things work or predict how they might change over time and under different conditions. |  |
| **5.** | **You might choose to study this subject if:**   * You enjoy problem-solving * You have good analytical skills, and you like to question and investigate other people’s theories * You enjoy maths and have good mathematical skills * You enjoy asking big questions such as: * How did the universe begin? * How will the universe change in the future? * How does the sun keep on shining? * What are the basic building blocks of matter?   You might also choose to study this subject if you are thinking of studying Physics or Engineering at university |  |
| **6.** | **Which subject is this?**  This is the scientific study of the mind and how it dictates and influences our behaviour, from communication and memory to thought and emotion. It’s about understanding what makes people tick and how this understanding can help address many of the problems and issues in society today.  You will gain knowledge and understanding of psychological concepts, theories, research and ethical issues and you will learn to critically analyse evidence. |  |
| **7.** | **If you choose to study this subject at A Level you will:**   * Use your creativity and imagination to develop and modify designs. * Learn to identify market needs and opportunities for new products and develop design solutions * Experiment, make and test your own products * Learn how a product can be developed through the stages of prototyping, realisation and commercial manufacture.   You will also develop an in-depth knowledge of materials, components and processes needed to make products and you will learn to work safely and skillfully to design and make your own products that solve real world problems. |  |

# Independent research topics

1. Choose a STEM subject you are interested in from the list below.
2. Click on the links to download a selection of resources about a specific topic for you to investigate.
3. Use the information in the resource pack to find out more about this topic.
4. Answer the questions in the pack.

**EXTENSION: you can do your own additional wider research if you wish.**

|  |  |
| --- | --- |
| **STEM Subject** | **Resource Pack Links** |
| Biology | [Biology Resource Pack.docx](https://heaccess-my.sharepoint.com/:w:/g/personal/katie_buckingham_hean_org_uk/ESluGCl-kndGlpPkobRn7_0BQIRTO2LwySsEzPI2ylYHLg?e=FRncbk) |
| Chemistry | [Chemistry Resource Pack .docx](https://heaccess-my.sharepoint.com/:w:/g/personal/katie_buckingham_hean_org_uk/Ecx6YN4P3uVDrA6_XXXyMyoBrpbvBT_A4QG7Od3E3DuQSg?e=uIZ5O2) |
| Physics | [Physics Resource Pack.docx](https://heaccess-my.sharepoint.com/:w:/g/personal/katie_buckingham_hean_org_uk/EXuPbICFoPNAj9g5moXw7o4BQA6RsYu-Zomy8zAxHMM-9A?e=3aX15a) |
| Maths | [Maths Resource Pack.docx](https://heaccess-my.sharepoint.com/:w:/g/personal/katie_buckingham_hean_org_uk/EQlA0blQMnZPvUCrZSK7E1wBLWCbdrv7A8pmk53zpzV6PQ?e=QXfemF) |
| Psychology | [Psychology Resource Pack.docx](https://heaccess-my.sharepoint.com/:w:/g/personal/katie_buckingham_hean_org_uk/ERLdn-QMmaZIvaNN7mt2PoMBDPgWnNcZxNfCK4oBkVrwZg?e=iUu3Ky) |
| Computer Science | [Computer Science Resource Pack.docx](https://heaccess-my.sharepoint.com/:w:/g/personal/katie_buckingham_hean_org_uk/EbROa12yiIFCkb2Xjwf9vRcBN4ssoRQ0g2usULvFugPEKg?e=RcqHOL) |
| Design & Technology | [Design & Technology Resource Pack.docx](https://heaccess-my.sharepoint.com/:w:/g/personal/katie_buckingham_hean_org_uk/EaGI5zsaX1NCon73CR8DG0QBArfLbQhzhLKDQo7HmE3xXA?e=vQ8Qhh) |

# Academic Word Lists

**List 1**

|  |  |  |  |
| --- | --- | --- | --- |
| access | adequate | annual | apparent |
| approximated | attitudes | attributed | civil |
| code | commitment | communication | concentration |
| conference | contrast | cycle | debate |
| despite | dimensions | domestic | emerged |
| error | ethnic | goals | granted |
| hence | hypothesis | implementation | implications |
| imposed | integration | internal | investigation |
| job | label | mechanism | obvious |
| occupational | option | output | overall |
| parallel | parameters | phase | predicted |
| principal | prior | professional | project |
| promote | regime | resolution | retained |
| series | statistics | status | stress |
| subsequent | sum | summary | undertaken |

1. Choose a few words from the list that you would choose to use in your writing. Think of some examples to show how you would use these words in a sentence.

2. Choose a few words that you would not choose to use. Why did you discard these words?

**List 2**

|  |  |  |  |
| --- | --- | --- | --- |
| academic | adjustment | alter | amendment |
| aware | capacity | challenge | clause |
| compounds | conflict | consultation | contact |
| decline | discretion | draft | enable |
| energy | enforcement | entities | equivalent |
| evolution | expansion | exposure | external |
| facilitate | fundamental | generated | generation |
| image | liberal | licence | logic |
| marginal | medical | mental | modified |
| monitoring | network | notion | objective |
| orientation | perspective | precise | prime |
| psychology | pursue | ratio | rejected |
| revenue | stability | styles | substitution |
| sustainable | symbolic | target | transition |
| trend | version | welfare | whereas |

1. Choose a few words from the list that you would choose to use in your writing. Think of some examples to show how you would use these words in a sentence.

2. Choose a few words that you would not choose to use. Why did you discard these words?

**List 3**

|  |  |  |  |
| --- | --- | --- | --- |
| abstract | accurate | acknowledged | aggregate |
| allocation | assigned | attached | author |
| bond | brief | capable | cited |
| cooperative | discrimination | display | diversity |
| domain | edition | enhanced | estate |
| exceed | expert | explicit | federal |
| fees | flexibility | furthermore | gender |
| ignored | incentive | incidence | incorporated |
| index | inhibition | initiatives | input |
| instructions | intelligence | interval | lecture |
| migration | minimum | ministry | motivation |
| neutral | nevertheless | overseas | preceding |
| presumption | rational | recovery | revealed |
| scope | subsidiary | tapes | trace |
| transformation | transport | underlying | utility |

1. Choose a few words from the list that you would choose to use in your writing. Think of some examples to show how you would use these words in a sentence.

2. Choose a few words that you would not choose to use. Why did you discard these words?

# A close up of a logo Description automatically generatedAcademic Writing

**Write a short text in the box below, summarising your research topic.**

* Use the answers you have written in your booklet
* Select and summarise the most important points
* Make sure your text gives the reader/listener a clear and accurate summary of your research topic.

# Editing Checklist

* **Read your text out loud**
* **Does it make sense?**
* **Does your text give the reader/listener a clear and accurate summary of your research topic?**
* **Are there any spelling/grammar mistakes that need correcting?**
* **Have you used between 5 and 10 words from the ‘Academic Word List’**
* **Is your text no more than 300 words?**

# Recording your voiceover

**Step 1: Preparation**

1. Practise reading your text out loud again
2. Time yourself – is it long enough to fill 60 seconds if you read it aloud?
3. Record yourself reading your text out loud

**Step 2: Recording**

**A picture containing clock

Description automatically generated**

**Mobile phone/tablet:** If you have access to a mobile phone or tablet you could record your voiceover clip using the “voice memo” tool.

**Computer/laptop:** If you have access to a desktop computer or laptop you may have a voice recorder app.

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Description automatically generated

**What if I can’t record myself?**

Don’t worry! You can still enter the competition.

You can send your written research to us and we will record the voiceover for you.

**Step 3: Send us your work**

Please send your work to the Causeway Team email address: [info@causeway.education](mailto:info@causeway.education)

If you have recorded a voiceover, **please send us the** **audio clip file attached to an email.**

If you have not been able to record your own voiceover, **please send us the text you have written about your research attached to an email.**

**If your research paragraph or voiceover is chosen by us, we will add it to our videos, credit you for your work (by including your name and school) and share the final video with your school.**

Good Luck!