Coursebook Designed by

Dr Revelation Samuel

# Contents


..... 1

**Timetable – Tutorials** ..... 3

**Timetable – Homework Assignments** ..... 3

**Assignment Submission – Lateness and Plagiarism** ..... 3

**Uni Pathways launch event** ..... 4

Baseline Assignment (essay based): Pupil Feedback Report ..... 11

Final Assignment (essay based): Pupil Feedback Report ..... 12

**What is the Purpose of Tutorial 1?** ..... 15

**What is the Purpose of Tutorial 2?** ..... 17

Schematic representation of a control volume within a vertical pipe and the forces acting on it ..... 20

**What is the Purpose of Tutorial 3?** ..... 20

**What is the Purpose of Tutorial 4?** ..... 24

**What is the Purpose of Tutorial 5?** ..... 25

**What is the Purpose of Tutorial 6?** ..... 28

**Final assignment feedback from your Uni Pathways Teacher** ..... 28

**What is the Purpose of Tutorial 7?** ..... 30

**Final assignment feedback from my Uni Pathways Teacher** ..... 30

**University** ..... 31

**Reflecting on Uni Pathways** ..... 31

**What is a reference?** ..... 32

**Why should I reference?** ..... 32

**When should I use a reference?** ..... 32

**How do I reference?** ..... 33

# Timetable and Assignment Submission

## Timetable – Tutorials

| Tutorial | Date | Time | Location |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 (Feedback) | | | |
| 7 (Feedback) | | | |

## Timetable – Homework Assignments

| Homework Assignment | Description | Due Date |
|---|---|---|
| Tutorial 1 | Baseline assignment | |
| Tutorial 2 | Glass research | |
| Tutorial 3 | Pipes | |
| Tutorial 4 | Journal reading | |
| Tutorial 5 | Final assignment | |

## Assignment Submission – Lateness and Plagiarism

| Lateness | |
|---|---|
| Submission after midnight on the due date | 10 marks deducted |
| **Plagiarism** | |
| Some plagiarism | 10 marks deducted |
| Moderate plagiarism | 20 marks deducted |
| Extreme plagiarism | Automatic fail |

# Uni Pathways launch event

Welcome to Uni Pathways! We are delighted to be able to launch the Uni Pathways programme with you. We hope that you are ready to embark on your Uni Pathways journey and that you enjoy the video.
You will be asked to pause the video at times to complete some work in this workbook, so make sure you have a pen / pencil to hand when you start the video.

By the end of the video, you will have

- Learnt about what studying at university means
- Learnt about some of the skills that you will develop during Uni Pathways
- Heard from pupils who have participated in Uni Pathways or The Scholars Programme (which is the same programme!)
- Heard from current university students talking about what life is like at university

If you are in school your teacher will play the video. If you are at home and logged in to a session with your teacher, your teacher will play the video and show it to you. If you are participating independently your teacher will email you the link to the video or the video file. There are opportunities for you to answer some questions, and you will be told when to pause the video to answer them.

**Introduction to Uni Pathways**

1. Write down what you think a supra-activity is

_____
_____
_____

2. Independent learning is

_____
_____
_____

3. Write down in your own words what resilience means, and come up with a different example to the one mentioned in the PowerPoint.

_____
_____
_____
_____

4. Why do you think analysis and evaluation skills are useful in your academic career? _____
_____
_____
_____
_____
_____

5. Why do you think analysis and evaluation skills are useful in life in general? _____
_____
_____
_____

6. What are the different types of learning that university students do?

**Pupils' experience of Uni Pathways**

You will now watch some pupils talk about their experience of learning a PhD topic and producing a final assignment. Some may refer to The Scholars Programme rather than Uni Pathways. As you heard in the introduction PowerPoint, The Scholars Programme is a very similar programme to Uni Pathways. Listen carefully and then respond to the questions below. Be prepared to share some of your responses with your peers.

1. How did the pupils describe talking about writing a long essay for their final assignment?

2. Write down something that one of the pupils mentioned was particularly interesting in their course.

3. What were some challenges that the pupils met?

**Virtual campus tours**

You will now go on a virtual tour of some universities! Once you have seen some of the university campuses, respond to the questions below.
Note down something that you liked out of any of the campus tours you saw. It may be a particular building, space, city etc.

1. Were there any similarities between the different university campuses? If so, what are the similarities?

2. If you had to pick one of those universities to go and visit in person, which one would it be and why?

3. Note down some of the societies that you could join at different universities

**Meet university students!**
You are about to virtually meet or hear from some current university students.
If you are virtually meeting them, think about what questions you would like to ask the students, share your questions with a partner and note those questions down in the space below.

If you are not meeting them but watching some videos that they have made, use the space below to note down what else you would like to find out about university. You can then ask your teacher during Uni Pathways tutorials!

**Reflection**
Congratulations on completing the launch of the Uni Pathways programme. Before you go, take some time to reflect on what you have learnt by answering the following questions:

1. Are there any aspects of university style learning that you would look forward to? If so, what are they?

2. What challenges do you think students face when learning at university? How would you try to overcome these challenges?

3. What skills do you hope to develop during your Uni Pathways course?

4. What part of Uni Pathways seems the most challenging for you?

5. What are you most looking forward to about Uni Pathways?

## Course Rationale

The Intergovernmental Panel on Climate Change IPCC identified carbon dioxide ($CO_2$) emissions as a major contributor to climate change (global warming). The Panel in its previous publications in (2014) concluded that "warming of the climate system is unequivocal and that increased emission in greenhouse gases, particularly $CO_2$ in the atmosphere have been accompanied by warming of the atmosphere and oceans, reducing snow and ice, ocean acidification and sea level rise". The Panel concludes that "there is an immediate need for implementation of various actions to reduce $CO_2$ emissions to mitigate these changes, including increased energy supply from renewable and nuclear sources, increased energy efficiency and moving to fossil-fuel based power with carbon capture and storage (CCS).

This course introduces the concept of mathematical modelling as a useful and unique tool in the fight against climate change. Think of taking out the excess carbon dioxide (CO2) from the atmosphere, wouldn't that minimise the global warming issue? But how can the excess CO2 be removed and where will it be stored? These questions will be answered in this course.

We will develop a simple mathematical model that describes the technique for storing CO2 in underground sites. We will discuss how safe it is to store CO2 underground and future uses of the stored CO2. Student will work on a simplified mathematical model that predicts this engineering concept of injecting CO2 into a selected underground site using Microsoft Excel. The model output will be interpreted in graphical images and a technical report discussing the result application will be produced.

# Uni Pathways Mark Scheme 2020 – maths-based assignments

| | Subject Knowledge | Critical Thinking | Written Communication |
|---|---|---|---|
| 1st | The work shows a depth of knowledge and understanding of key concepts and mathematical methods, drawing on sources of evidence where appropriate.<br>Knowledge is used to build and support highly effective mathematical arguments and explanations. | Analyses the available data/evidence and identifies all the relevant mathematical information.<br>Identifies and critically evaluates available mathematical approaches and evidence, deciding on their credibility, strength and relative significance.<br>Makes connections between different pieces of information and puts them together to form accurate solutions and verify answers and assumptions. | Mathematical arguments are complete, and the reasoning behind each step has been clearly communicated to the reader.<br>The work has a coherent flow and is well structured.<br>The writing style is appropriate; mathematical language and key mathematical terms are used accurately and effectively to support the arguments and explanations made.<br>There are no, or very few, errors in spelling or grammar.<br>Consistent referencing, appropriate paragraphing and use of correctly labelled tables and figures; matching the style taught in the course. |
| 2:1 | The work shows an understanding of key concepts and mathematical methods, drawing on sources of evidence where appropriate.<br>Knowledge is used to build and support effective mathematical arguments and explanations. | Analyses the available data/evidence and identifies all the relevant mathematical information.<br>Engages with multiple approaches and critically evaluates their utility, forming judgements and using reasoning and evidence to inform problem solving strategy.<br>Shows some understanding of the relative value of evidence and data. | Mathematical arguments are clearly made, with few gaps in logical reasoning.<br>The work is well-structured.<br>The writing style is appropriate; mathematical language and key terms are used correctly.<br>There are few errors in spelling or grammar.<br>Mostly consistent referencing and use of tables and figures; matching the style taught in the course. |
| 2:2 | The work shows an understanding of key concepts and mathematical methods, with no major misconceptions.<br>Beginning to apply this knowledge to build and support effective mathematical arguments and explanations. | Identifies and uses basic mathematical evidence and reasoning.<br>Evaluates the quality of mathematical reasoning and evidence, forming judgements.<br>Not yet showing understanding of the relative value of evidence and reasoning. | Mathematical arguments have been constructed, but there is little explanation from step to step.<br>The work has some structure.<br>The writing style can sometimes be informal; occasionally key terms are not used when it would be appropriate to do so.<br>There are some errors in |

| | | | |
|---|---|---|---|
| | | | grammar and spelling, but these do not get in the way of communicating the content.<br>Referencing has some consistency; matching the style taught in the course. Limited use of tables and figures. |
| 3rd | Shows a developing understanding of key concepts and mathematical methods, with some misconceptions.<br>Not yet applying this knowledge to build and support mathematical arguments and explanations. | Beginning to analysis mathematical evidence and reasoning.<br>Describes or attempts to solve the problem without any/or little evaluation of whether the approach was reasonable or accurate. | Mathematical arguments to solve problems are poorly sequenced, with little or no explanation.<br>The grammar, spelling, style, and structure of the work need improving in order to communicate ideas to the reader.<br>Key terms are not always used correctly.<br>Limited, or no use of referencing, tables and figures. |

# Baseline Assignment (essay based): Pupil Feedback Report

| | |
|---|---|
| Name of Pupil | |
| Name of School | Malcolm Arnold Academy |
| Name of RIS teacher | Dr Revelation Samuel |
| Title of Assignment | |

How your assignment is graded:

| Grade | Marks | What this means |
|---|---|---|
| 1st | 70+ | Performing to an excellent standard at A-level |
| 2:1 | 60-69 | Performing to a good standard at A-level |
| 2:2 | 50-59 | Performing to an excellent standard at GCSE |
| 3rd | 40-49 | Performing to a good standard at GCSE |
| Working towards a pass | 0-39 | Performing below a good standard at GCSE |
| Did not submit | DNS | No assignment received by The Brilliant Club |

| Lateness | |
|---|---|
| Any lateness | 10 marks deducted |
| **Plagiarism** | |
| Some plagiarism | 10 marks deducted |
| Moderate plagiarism | 20 marks deducted |
| Extreme plagiarism | Automatic fail |

Marks

| | | | |
|---|---|---|---|
| OVERALL MARK / 100 | | FINAL MARK / 100 (including any deductions) | |
| DEDUCTED MARKS | | FINAL GRADE | |

If marks have been deducted (e.g. late submission, plagiarism) the teacher should give an explanation in this section:

Mark Breakdown and Feedback

| Subject knowledge | |
|---|---|
| | *mark* |
| | |
| | |
| **Critical thinking** | |
| | *mark* |
| | |
| | |
| **Written communication** | |
| | *mark* |
| | |
| | |

# Final Assignment (essay based): Pupil Feedback Report

| | |
|---|---|
| Name of Pupil | |
| Name of School | Malcolm Arnold Academy |
| Name of RIS teacher | Dr Revelation Samuel |
| Title of Assignment | |

How your assignment is graded:

| Grade | Marks | What this means |
|---|---|---|
| 1st | 70+ | Performing to an excellent standard at A-level |
| 2:1 | 60-69 | Performing to a good standard at A-level |
| 2:2 | 50-59 | Performing to an excellent standard at GCSE |
| 3rd | 40-49 | Performing to a good standard at GCSE |
| Working towards a pass | 0-39 | Performing below a good standard at GCSE |
| Did not submit | DNS | No assignment received by The Brilliant Club |

| Lateness | |
|---|---|
| Any lateness | 10 marks deducted |
| **Plagiarism** | |
| Some plagiarism | 10 marks deducted |
| Moderate plagiarism | 20 marks deducted |
| Extreme plagiarism | Automatic fail |

Marks

| | | | |
|---|---|---|---|
| OVERALL MARK / 100 | | FINAL MARK / 100 (including any deductions) | |
| DEDUCTED MARKS | | FINAL GRADE | |

If marks have been deducted (e.g. late submission, plagiarism) the teacher should give an explanation in this section:

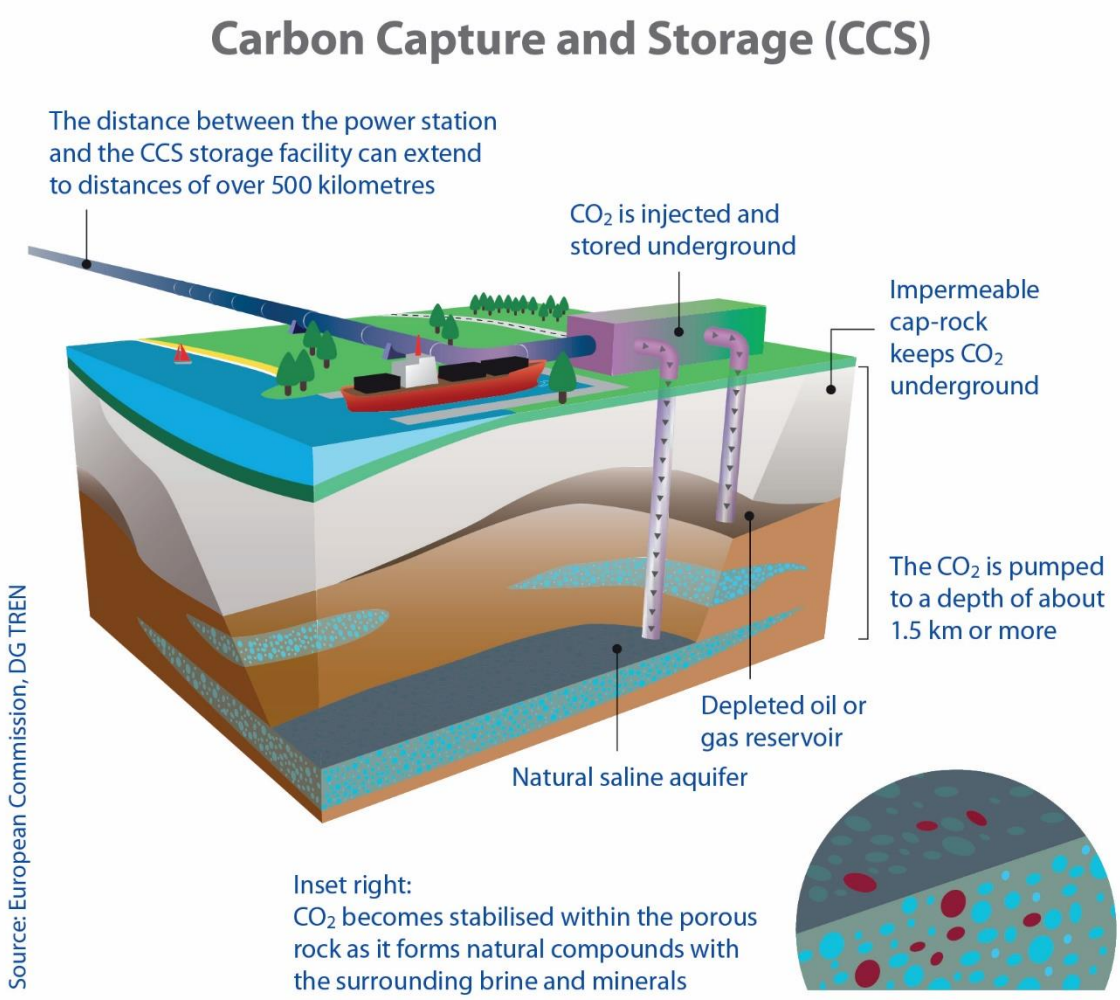
Mark Breakdown and Feedback

| Subject knowledge | |
|---|---|
| | *mark* |
| | |
| | |
| **Critical thinking** | |
| | *mark* |
| | |
| | |
| **Written communication** | |
| | *mark* |
| | |
| | |

# Subject Vocabulary

| Word | Definition | In a sentence |
|---|---|---|
| Climate change | describes a change in the average conditions such as temperature and rainfall in a region over a long period of time | |
| Emission | the release of greenhouse gases into the atmosphere over a specified area and period of time | |
| Greenhouse gas | Are Water vapour, Carbon dioxide, Methane, Ozone, Nitrous oxide and Chlorofluorocarbons | |
| CCS | Carbon capture and storage technology | |
| Model | The representation of a system expressed in mathematical language | |
| Phase diagram | is a graphical representation of the physical states of a substance under different conditions of temperature and pressure | |
| CO2 Injection | The act of pumping CO2 into an underground storage | |
| Transient flow | Describes an unsteady (changing) fluid flow with respect to time | |
| Homogeneous | Denotes a process involving substances in the same phase (solid, liquid, or gas). | |
| Simulation | the production of a computer model for the purpose of study | |
| Mass/material balance | Describes an application of conservation of mass to the analysis of physical systems. | |

# Tutorial 1 – Introduction to CCS and Mathematical Modelling



## What is the Purpose of Tutorial 1?

By the end of the tutorial, pupils will:

1. Rate activities that contribute to the global climate change
2. Have an understanding of the carbon capture and storage engineering concept
3. Know the meaning of mathematical modelling
4. Rehearse 3 applications of mathematical models

### I. Activity 1

Individual task
Arrange the following activities on a scale 1 to 10 based on how you suppose each one promotes climate change (More likely 1 – 10 Less likely).

| **Activity** | **Scale** |
|---|---|
| Using a fossil fuel (E.g. Petrol/Diesel) engine cars | |
| Cycling and use of electric cars | |
| Electricity generation from coal or natural gas | |
| Cutting more trees than planting | |
| Printing electronic documentations into hard copies and disposing them | |
| Nuclear power plant generating electricity | |
| Using a gas cooker at home | |
| Removing the excess Carbon dioxide from the atmosphere | |
| Construction of more roads, bridges and houses | |
| Charcoal home heating | |

Group task
Now rank them again in your pairs.

| **Activity** | **Scale** |
|---|---|
| Using a fossil fuel (E.g. Petrol/Diesel) engine cars | |
| Cycling and use of electric cars | |
| Electricity generation from coal or natural gas | |
| Cutting more trees than planting | |
| Printing electronic documentations into hard copies and disposing them | |
| Nuclear power plant generating electricity | |
| Using a gas cooker at home | |
| Removing the excess Carbon dioxide from the atmosphere | |
| Construction of more roads, bridges and houses | |
| Charcoal home heating | |

Now let's compare our rankings

| Individual rankings | Pair rankings | Expert rankings |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| | | |
| | | |

**II. Activity 2**

CCS video clips: Define the following.

Carbon capture and storage process is
……
……

Pre-combustion process is
……
……

Post-combustion process is
……
……

Oxyfuel process is
……
……

The main stages of CCS are
……
……
……
……

**III. Activity 3**

Presentation on mathematical modelling

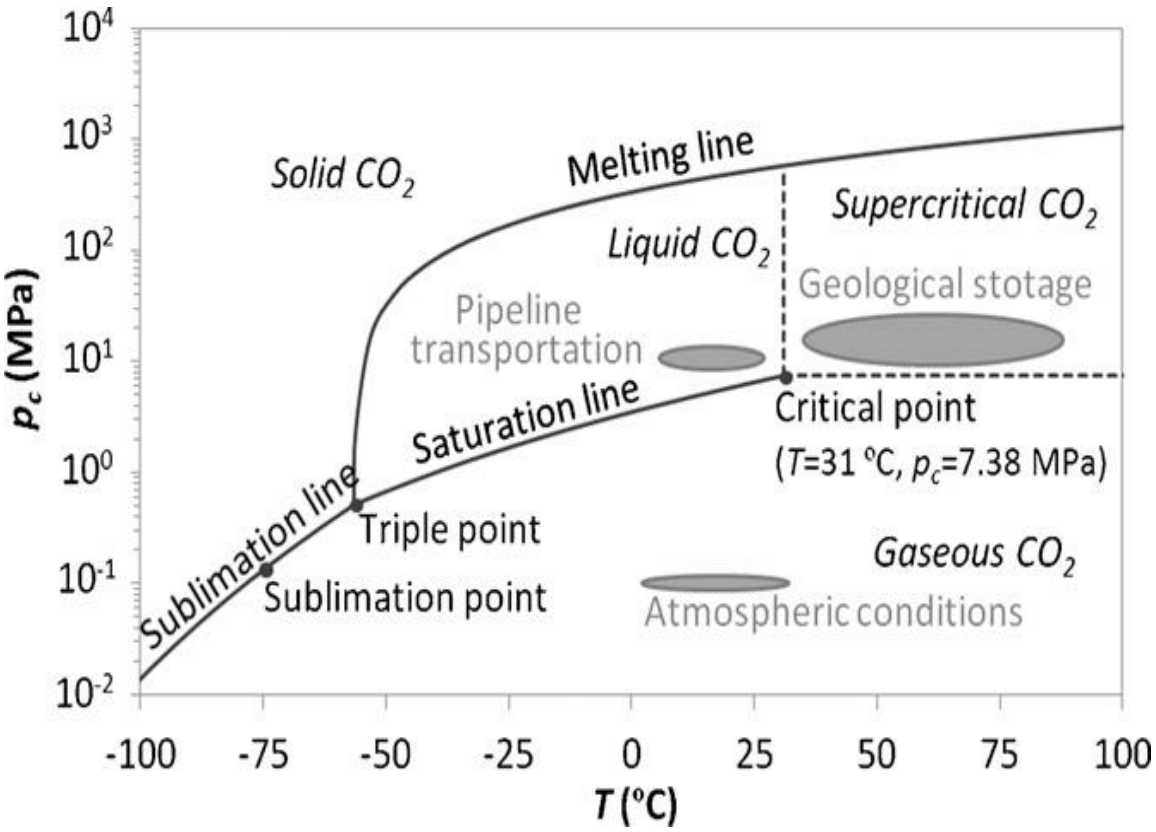
Mathematical modelling is
……
……

Three applications of mathematical modelling are
……
……
……
……
……
……

**Homework: Baseline assignment**

Using a poster discuss the engineering concept of carbon capture and storage (CCS) in relation to CO2 emissions reduction.
The poster should have appropriate diagrams showing the main ideas of carbon capture, compression, pipeline transportation and injection connected in such coherent manner including a brief explanation of the various stages of CCS.

## Tutorial 2 – The Phase Diagram




$CO_2$ phase diagram showing various regions (Oldenburg, 2007)

## What is the Purpose of Tutorial 2?

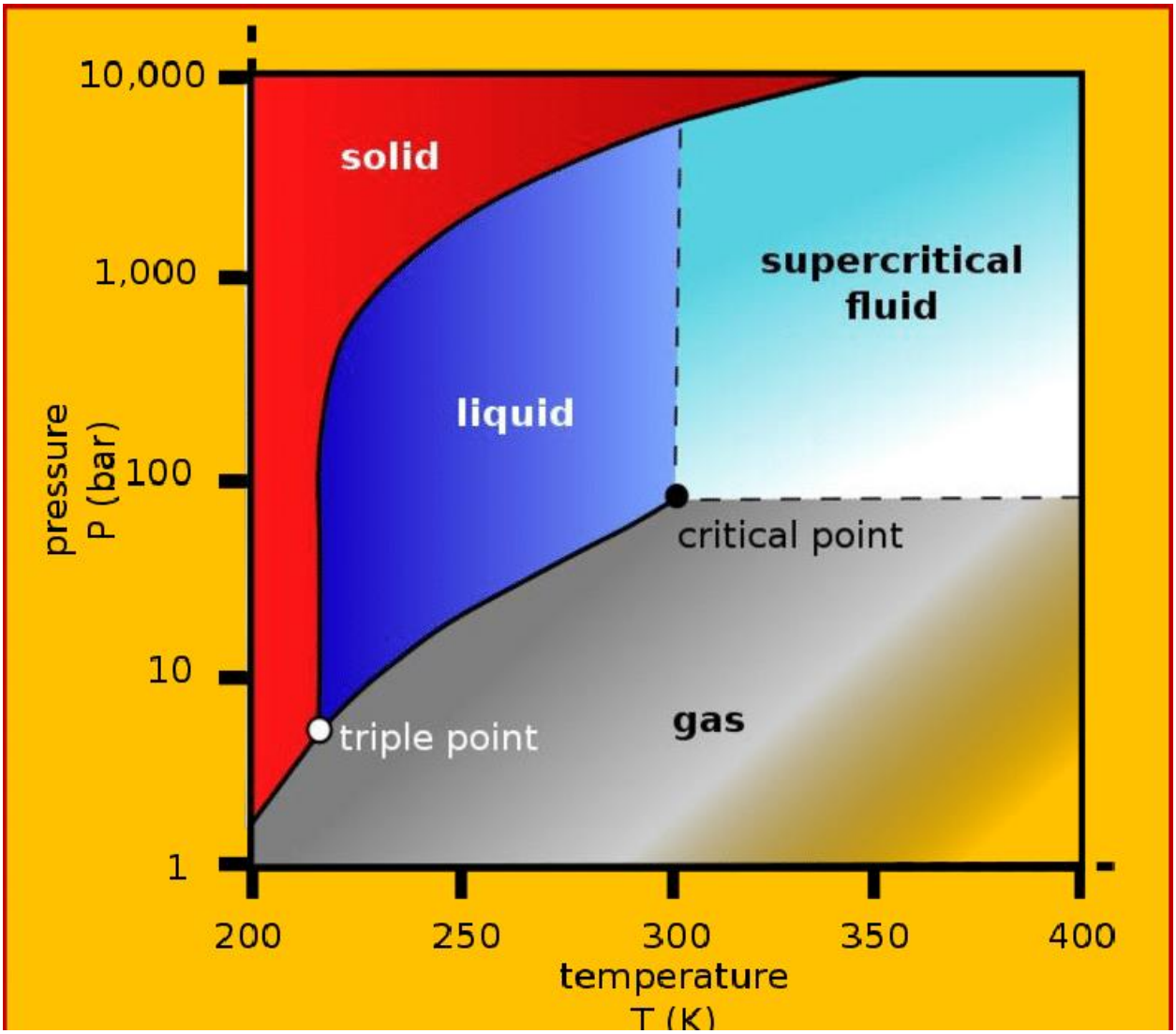
- Pupils will understand and interpret the CO2 phase diagram
- Pupils will know the CO2 optimum injection pressure and temperature range and why
- Pupil will understand the meaning of transient homogeneous flow modelling

We will look at CO2 behaviour in varying phases focusing on understanding the optimum pressure and temperature range for injection into the underground reservoir. The optimum CO2 flow phase will be established.

**Starter task:**

**Attempt to locate each letters a – h at a region or line in the diagram below: Do it individually first and then in pairs compare your choices**

a) Ice CO2
b) Wet CO2
c) CO2 in Air
d) Supersaturated CO2
e) Combination of (a) and (b)
f) Combination of (b) and (c)
g) Combination of (a), (b) and (c)
h) Combination of (b), (c) and (d)




The CO2 pressure-temperature phase diagram shows the various phases (solid, liquid, gas and supercritical) and transition points (triple point and critical point).

**I. Activity 1**

**Presentation on CO2 phase behaviour**

Write down the definition of these key terms.

Phase diagram is
……
……

Sublimation line is
……
……

Triple point is
……
……

Saturation line is
……
……

Melting line is
……
……

Critical point is
……
……

Why is CO2 best injected underground in supercritical phase?
……
……

Which CO2 phase is most preferable for pipeline transportation?
……
……

**II. Activity 2**

Discover the optimum and understanding the flow phase

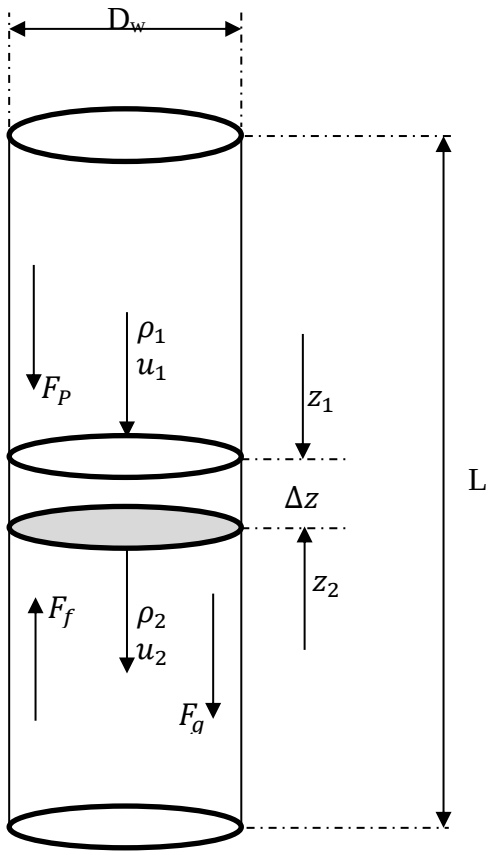
The optimum CO2 injection pressure and temperature ranges are:
……
……

Transient homogeneous flow is
……
……
……
……
……
……

**Homework: Tutorial 2**

Carry out a quick research to find out the raw materials required for the manufacture of glasses. Explore various types of glass finished products.
Make a list of all the raw materials and we will use the list to write an algebraic equation in the next tutorial.

# Tutorial 3 – Developing a mathematical model




Schematic representation of a control volume within a vertical pipe and the forces acting on it

## What is the Purpose of Tutorial 3?

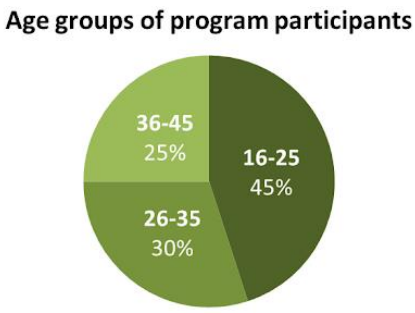
- Pupil will have an understanding of the key elements in developing a mathematical model
- Pupil will know how mathematical models are developed
- Pupil will understand how to algebraically simplified a mathematical model

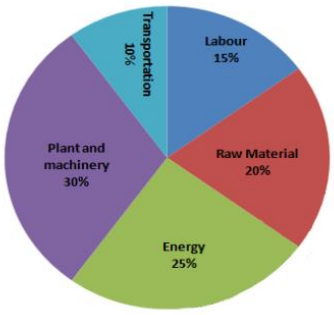
We will cover the key elements for developing a mathematical model. We will then develop a model for the manufacture of glass. Write the model in simplified algebra. Pupils will work in pairs to develop a model for delivering water to 5 homes.

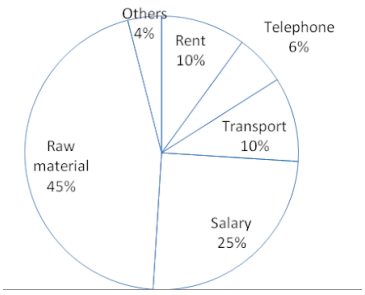
**Starter task:**

**Write simple equations to represent the information on each pie chart. Work in pairs please**

a) Total participants =
b) Total expenses =
c) Total expenses =




a b c

Now workout the numbers for each portion using the total figures reported below and check with your equations.

a) 200 participants
b) $5000 annual expenses
c) $10,000 annual expenses

## I. Activity 1

**Presentation on the development of mathematical model**

Write down 3 key elements of mathematical modelling

……
……
……

**Steps in developing mathematical modelling**

Step 1: Equate the materials in and out of the system

……

Step 2: Simplify the terms algebraically

……

Step 3: Write a model equation for simulation

……..

## II. Activity 2

**Class exercise in pairs:**

Write a volumetric mathematical model for supplying water to 5 homes. Starting with $V_T$ as total volume of water and $A_T$ as area of the main distribution pipe. Use $V_1 – V_5$ and $A_1 – A_5$ for volumes of water and areas of the 5 distribution pipes respectively.

……
……
……

**Homework: Tutorial 3**

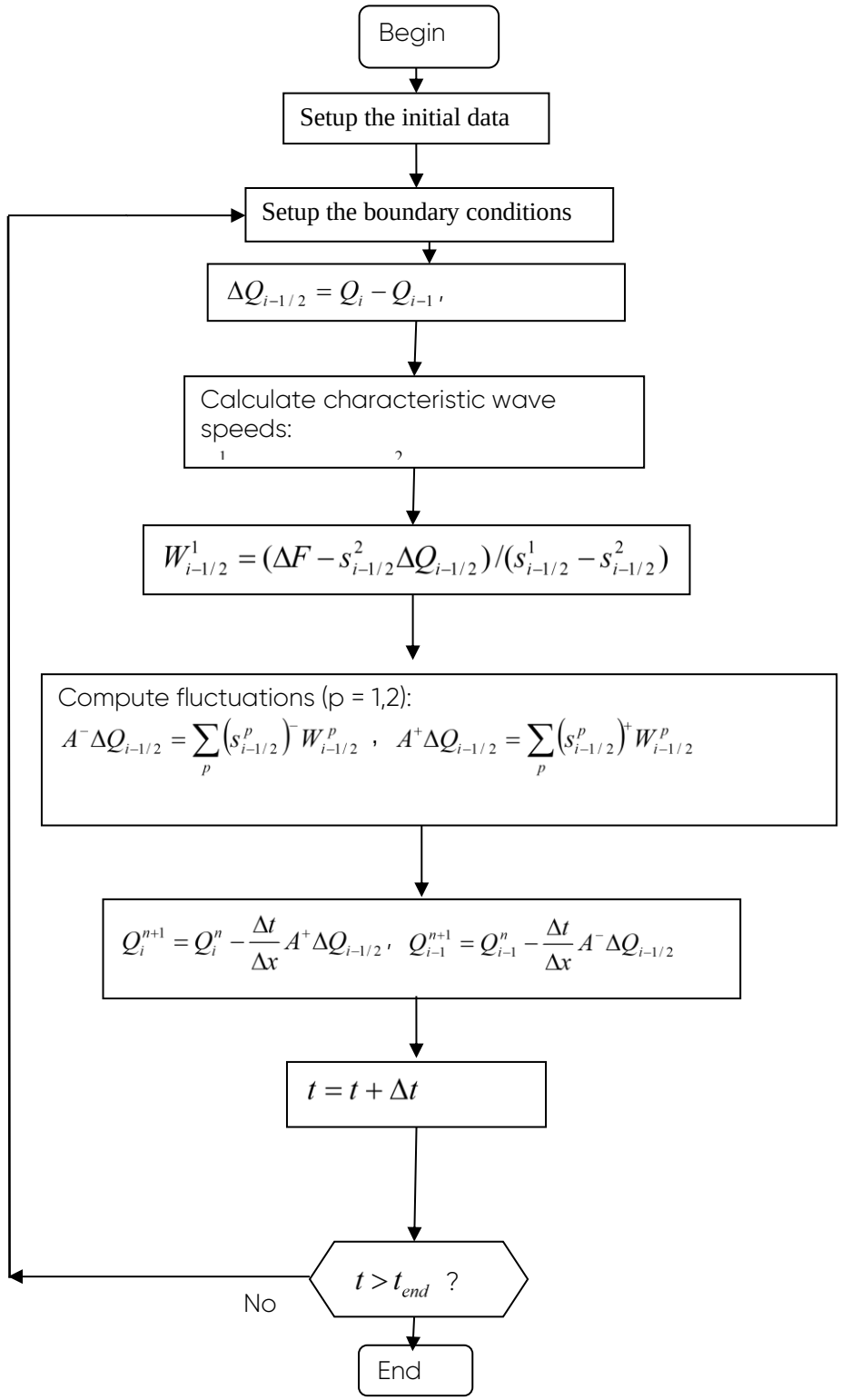
The table below contains information regarding supply of water to 5 homes through a main supply pipe. Complete the table and use the information to answer the questions below.

| Home | Volume ($m^3$) | Area (m) | Vol x Area |
|---|---|---|---|
| 1 | | 2.5 | 250 |
| 2 | 120 | | 240 |
| 3 | 90 | 3.5 | |
| 4 | | 6 | 300 |
| 5 | 150 | | 350 |
| **Total** | | | |

i. Work out the total volume and area of the main supply pipe.

ii. Work out the flowrate (F = Mass/Volume) of the main supply pipe if the mass of water is 18 kg.

# Tutorial 4 – Excel model simulation




A sample simulation model

## What is the Purpose of Tutorial 4?

- Pupils will utilise Microsoft Excel to execute a basic model simulation
- Pupils will generate plots of key variables such as Pressure versus Flowrate and Temperature versus Flowrate

We will cover utilising Excel for solving the model equations previously developed in Tutorial 3. The goal is getting pupils to know how/what to plot that explain result of the simple simulation.

**Starter task:**

Open MS Excel and enter the completed table from your tutorial 3 homework. Attempt to write a formula that automatically evaluates the total volume and area of the main supply pipe.

### I. Activity 1

Given the model equations for pressure and temperature of a CO2 injection system

$P=(m*F+t/\lambda)K$

$T=(m*F+t)K/\alpha$

Where
P (bar) is pressure of the system
T (K) is temperature of the system
m (kg) is mass of the CO2
F ($m^3kg^{-1}$) is flowrate of the CO2
t (s) is time
K is site specific constant
$\lambda$ (0.03) is pressure constant
$\alpha$ (0.05)is temperature constant

Select a site below and generate a sample data for pressure and temperature by varying the flowrate from 10 to 100 $m^3kg^{-1}$.
CO2 injection site constants

| | |
|---|---|
| Depleted oil field | 0.02 |
| Depleted gas field | 0.015 |
| Saline aquifer | 0.15 |
| Coal seams | 0.125 |

### II. Activity 2

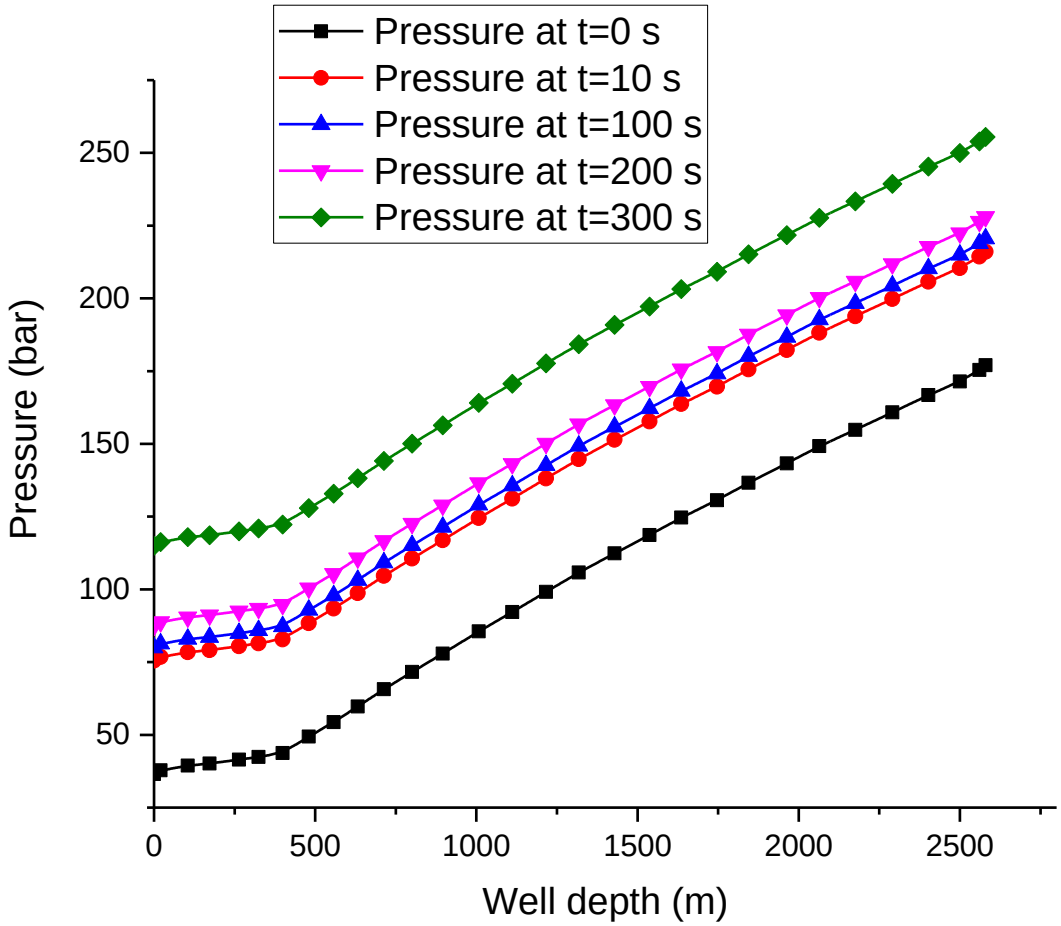
a) Plot pressure versus flowrate for the data generated above in Activity 1

b) Plot temperature versus flowrate for the data generated above in Activity 1

**Homework: Tutorial 4**

Read the result discussion session of the following journal (https://discovery.ucl.ac.uk/id/eprint/10080137/). Write down the summary of any two plots in the journal. Then write a brief discussion of the two plots from Activity 2.

## Tutorial 5 – Analysing simulation results




Example of plot generated from a mathematical model result showing CO2 injection well pressure changes at varying times.

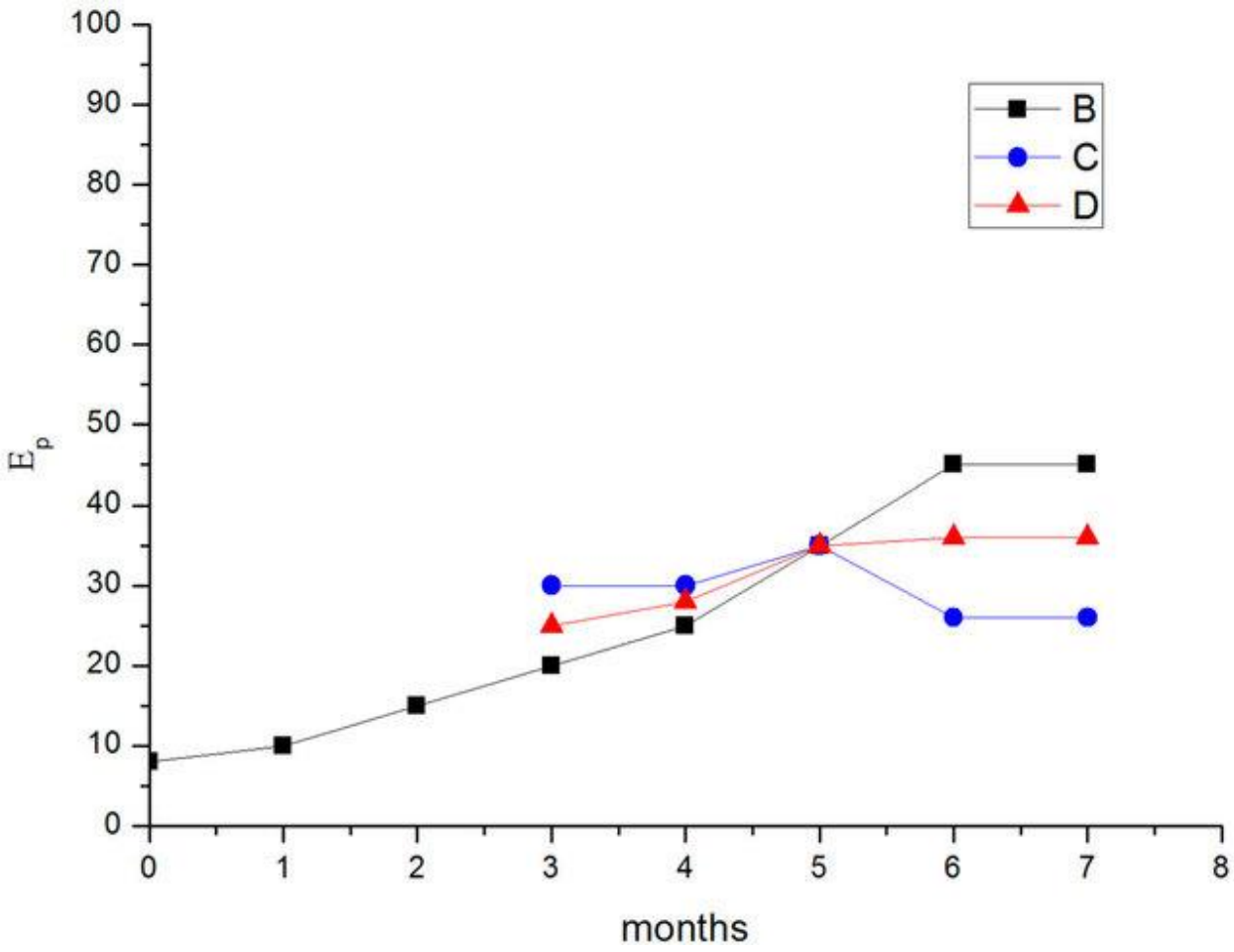
### What is the Purpose of Tutorial 5?

- Pupils will technically analyse and evaluate the model results by comparing and contrasting the varying outcomes
- Pupil will learn how to write a scientific/engineering technical report

We will learn how to technically analyse the plots from Tutorial 4. We will also go through how to write a scientific/engineering report.

**Starter task:**

The Figure below shows Year 9 students Performance (Ep) by month. Graph B represents classroom data, C the post-instructional assessments and D represents the average of B and C.
Technically discuss the graph in your pairs by writing out two key conclusions you can draw from the graph.




## I. Activity 1

Technical report writing presentation

What should we look out for in a scientific technical report?

……

……

# Final Assignment

**What important role can mathematical modelling play in the global fight against climate change?**

Produce a report (maximum 2000 words) that answers the above question. Your report should include the following sections:

- Abstract: A summary of the main learning points during this Uni Pathways course. Complete the rest of the report before writing the abstract. See the abstract on the journal in homework 4.
- Introduction/Literature survey: An introduction to how CO2 emission affects the Earth's climate. How can CO2 emissions reduction through CCS help limit this effect?
- Model development: The core part of your report: an in-depth description of mathematical modelling for CO2 storage that follow the example from Tutorial 3
- Results and Conclusion: A brief description and analysis of a modified version of the mathematical model for CO2 storage and simulation using Microsoft Excel. Include clear plots of your results and some evaluation of these plots. Draw clear conclusions and state the limitations of your solution.

Tips:

1. Your baseline assignment, homework and group posters should help you to form this report.
2. Make sure your report is coherent (each section should lead into the next).
3. Remember you will also be marked on your spelling, punctuation, grammar and the correct use of subject vocabulary and referencing.
4. Referencing style: Harvard (Author Name, Year) or using a numbering system[1]

## Tutorial 6 – Feedback tutorial

## What is the Purpose of Tutorial 6?

- To receive feedback on your final assignment
- To respond to the feedback from your Uni Pathways teacher
- To write targets for improvement on your final assignment

## Final assignment feedback from your Uni Pathways Teacher

(Remember to look at the mark scheme to help you understand what you have done well so far, and how you can do even better in your final assignment)

| Here are three things that my Uni Pathways Teacher thought I did well in my draft assignment |
| --- |
| • <br><br>• <br><br>• |

| Here are three things that my Uni Pathways Teacher thinks that I could do to get a higher mark in my final assignment |
| --- |
| • <br><br>• <br><br>• |

| Tasks from my Uni Pathways Teacher to do during the feedback tutorial to help me improve |
| --- |
| • <br><br>• <br><br>• |
| My response: |

| Actions I will take to improve my final assignment after this tutorial… |
| --- |
| • <br><br>• <br><br>• |

| Hand in date for my final assignment: | |
| --- | --- |

## Tutorial 7 – Final tutorial

## What is the Purpose of Tutorial 7?

- To receive feedback and a grade on your final assignment.
- To reflect on the programme including what you enjoyed and what was challenging.
- To ask any questions you may have about university.

## Final assignment feedback from my Uni Pathways Teacher

| Final mark: | University style grade: |
|---|---|
| Feedback: Here are three things that my Uni Pathways teacher thought I did well in my final assignment<br>•<br>•<br>• | |

| Here are three things that my Uni Pathways teacher thinks I should remember for when I am doing this kind of study in the future |
|---|
| •<br>•<br>• |

## University

| What questions do you still have about University after taking part in Uni Pathways? |
| --- |
| • <br>• <br>• |

## Reflecting on Uni Pathways

| What did you most enjoy about Uni Pathways? |
| --- |
| • <br>• <br>• |

| What did you find challenging about the programme? | How did you overcome these challenges? |
| --- | --- |
| • <br>• <br>• | • <br>• <br>• |

# Appendix 1 – Referencing correctly

When you get to university, you will need to include references in the assignments that you write, so we would like you to start getting into the habit of referencing in your Brilliant Club assignment. This is really important, because it will help you to avoid plagiarism. Plagiarism is when you take someone else's work or ideas and pass them off as your own. Whether plagiarism is deliberate or accidental, the consequences can be severe. In order to avoid losing marks in your final assignment, or even failing, you must be careful to reference your sources correctly.

## What is a reference?

A reference is just a note in your assignment which says if you have referred to or been influenced by another source such as book, website or article. For example, if you use the internet to research a particular subject, and you want to include a specific piece of information from this website, you will need to reference it.

## Why should I reference?

Referencing is important in your work for the following reasons:

- It gives credit to the authors of any sources you have referred to or been influenced by.
- It supports the arguments you make in your assignments.
- It demonstrates the variety of sources you have used.
- It helps to prevent you losing marks, or failing, due to plagiarism.

## When should I use a reference?

You should use a reference when you:

- Quote directly from another source.
- Summarise or rephrase another piece of work.
- Include a specific statistic or fact from a source.

## How do I reference?

There are a number of different ways of referencing, and these often vary depending on what subject you are studying. The most important to thing is to be consistent. This means that you need to stick to the same system throughout your whole assignment. Here is a basic system of referencing that you can use, which consists of the following two parts:

1. **A marker in your assignment**: After you have used a reference in your assignment (you have read something and included it in your work as a quote, or re-written it your own words) you should mark this is in your text with a number, e.g. [1]. The next time you use a reference you should use the next number, e.g. [2].
2. **Bibliography**: This is just a list of the references you have used in your assignment. In the bibliography, you list your references by the numbers you have used, and include as much information as you have about the reference. The list below gives what should be included for different sources.

    a. **Websites** – Author (if possible), title of the web page, website address, [date you accessed it, in square brackets].

    E.g. Dan Snow, 'How did so many soldiers survive the trenches?', http://www.bbc.co.uk/guides/z3kgjxs#zg2dtfr [11 July 2014].

    b. **Books** – Author, date published, title of book (in italics), pages where the information came from.

    E.g. S. Dubner and S. Levitt, (2006) *Freakonomics*, 7-9.

    c. **Articles** – Author, 'title of the article' (with quotation marks), *where the article comes from* (newspaper, journal etc.), date of the article.

    E.g. Maev Kennedy, 'The lights to go out across the UK to mark First World War's centenary', Guardian, 10 July 2014.

# Notes

# Notes

# Notes

UNI PATHWAYS

UNI PATHWAYS

researchersinschools.org