Why does it always rain on me?

Key Stage 4 Programme

Pupil Name	
Handbook Designed by	Dr Wright

Timetable and Assignment Submission

Timetable – Tutorials

1			
2			
3			
4			
5			
6 (Feedback)			

Timetable – Homework Assignments

Tutorial 1		
Tutorial 2		
Tutorial 3		
Tutorial 4		
Tutorial 5		

Assignment Submission – Lateness and Plagiarism

Lateness	
Submission after midnight on 9th August	10 marks deducted
Plagiarism	
Some plagiarism	10 marks deducted
Moderate plagiarism	20 marks deducted
Extreme plagiarism	Automatic fail

The Brilliant Club KS4 Programme – Pupil Feedback Report

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

Name of PhD Tutor			
Title of Assignment			
Name of Pupil			
Name of School			
ORIGINAL MARK / 100		FINAL MARK / 100	
DEDUCTED MARKS		FINAL GRADE	

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

Learning Feedback Comment 1 – *Enter Key Learning Priority Here*	
What you did in relation to this Key Learning Priority	How you could improve in the future
Learning Feedback Comment 2 – *Enter Key Learning Priority Here*	
What you did in relation to this Key Learning Priority	How you could improve in the future
Learning Feedback Comment 3 – *Enter Key Learning Priority Here*	
What you did in relation to this Key Learning Priority	How you could improve in the future
Resilience Comment	
How you showed learning resilience during the course	How you could build learning resilience in the future

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Course Rationale

What is weather? Weather is the state of the atmosphere at any given time. There are some places on Earth that see very little change in the weather from day-to-day; how boring is that? We are lucky in the UK that our weather can change from heavy rain to glorious sunshine in a matter of a couple of hours. The weather of any given area is important as it has a considerable impact on the water, sunlight and temperature of the environment. These factors play a serious role by influencing the types of plants and animal wildlife that can survive in the area.

A meteorologist will describe the weather in terms of accurate measurements of temperature, humidity, rainfall, pressure and many others. This course will provide you with background knowledge of each of these and help you understand the difference between weather and climate. Furthermore, you will gain an understanding of the importance and formation of clouds and weather forecasts. You will also delve into why the UK weather is so unique.

The final assignment of this course is aimed at providing you with an insight into how to present work at a university level. You will gain knowledge on how to write an abstract for a scientific presentation and get the opportunity to work as a group to present the presentation at a mini scientific style conference. You will also develop the skills needed to be able to write a scientific document, including references and captioning. As well as increasing your scientific understanding of the weather, this course will also help you to improve skills such as, presentation, communication and scientific writing. These transferable skills will not only help you gain a greater understanding of the topic but will also help you on your path through further education.

Course Objectives

The overarching objectives of this Meteorology course are:

- To understand the mechanisms for cloud formation,
- To gain an understanding of the generation of a weather forecast,
- To understand the different weather phenomena of the UK,
- To gain an understanding of practical development,
- To be able to present in a scientific manner.

Mark Scheme Table

	Skills	1st (70-100)	2:1 (60-69)	2:2 (50-59)
Subject knowledge	Knowledge and Understanding	o All content included is relevant to the general topic and to the specific question/title o Good understanding of all the relevant topics. o Scientific terms are defined and used accurately throughout o Clear justification on how the content included is related to the specific issues that are the focus of the assignment	o Most of the content included is relevant to the general topic and to the specific question/title o Good understanding of most the relevant topics o Scientific terms are used accurately but not always clearly defined. o Adequate justification on how the content included is related to the specific issues that are the focus of the assignment	o Some of the content included is relevant to the general topic and to the specific question/title o Good understanding on some of the relevant topics but occasional confusion on others. o Scientific terms are used mostly accurately with occasional confusion and often not defined. o Some justification on how the content included is related to the specific issues that are the focus of the assignment
Critical thinking	Research and Evidence	o Inclusion of rich sources of research findings, data, quotations or other sourced material as evidence for the claims/ ideas o Use evidence/calculations to support claims/assertions /ideas, consistently clearly and convincingly o Evidence of further reading beyond materials provided which were used in an appropriate context o Data is effectively analysed and appropriate assumptions/conclusions are reached	o Inclusion of adequate sources of research findings, data, quotations or other sourced material as evidence for the claims/ ideas o Use evidence/calculations to support claims/assertions/ideas, mostly clearly and convincingly o Evidence of further reading beyond materials provided o Data is analysed and the assumptions/conclusions that are reached are mostly appropriate	o Inclusion of some sources of research findings, data, quotations or other sourced material as evidence for the claims/ ideas o Use evidence/calculations to support claims/assertions/ideas, at times clearly and convincingly o Limited evidence of further reading beyond materials provided o There is an attempt to analyse data is and draw assumptions/conclusions
	Developing an Argument	o A point of view or position in relation to the title or question is	o A point of view or position in relation to the title or question is	o A point of view or position in relation to the title or question is

		consistently clear ○ Argument/proof exceptionally well-developed and well-justified ○ A position is clearly established in relation to the question, and is developed effectively and consistently throughout the essay ○ Makes links effectively between subjects that have not previously been associated ○ Uses concepts from the tutorials in an unfamiliar context, and does so accurately and confidently. ○ Content is analysed effectively to support the argument	adequately clear ○ Argument/proof clear and well-developed and position justified ○ A position is established in relation to the question, and is well-developed in most of the essay ○ Some evidence of linking subjects that have not previously been associated ○ Use some concepts from the tutorials in an unfamiliar context, but not always accurate ○ Analysis of content to support the argument	somewhat clear ○ Argument/proof clear but not well-developed ○ A position is established in relation to the question, and is well-developed in parts of the essay ○ Limited evidence of linking subjects that have not previously been associated ○ Limited use of concepts from the tutorials in other contexts ○ Some analysis of content to support the argument
	Critical Evaluation	○ Moved beyond description to an assessment of the value or significance of what is described ○ Evaluative points are consistently explicit/systematic/reasoned/justified ○ Effective critiques on the reliability of sources provided	○ Mostly description but some assessment of the value or significance of what is described ○ Evaluative points are mostly explicit/systematic/reasoned/justified ○ Some evidence of critiques on the reliability of sources provided	○ Only description with minimal assessment of the value or significance of what is described ○ Evaluative points are at times explicit/systematic/reasoned/justified ○ Limited evidence of critiques on the reliability of sources provided
Written communication	Structure and Presentation	○ Ideas are presented in paragraphs and arranged in a logical structure that is appropriate for the assignment ○ The introduction clearly outlines how the essay/report will deal with the issues ○ The conclusion summarises all the main points clearly and concisely	○ Ideas are presented in paragraphs and arranged in a structure that is mostly appropriate for the assignment ○ The introduction adequately describes how the essay/report will deal with the issues ○ The conclusion summarises most of the main points clearly ○ Calculations,	○ Ideas are presented in paragraphs and arranged in a structure ○ The introduction mentions how the essay/report will deal with the issues ○ The conclusion summarises some of the main points clearly ○ Calculations, formulas and methods are not always structured, clear to follow

		○ All calculations, formulas and methods are clearly structured, clear to follow and correct ○ Tables and graphs are effectively constructed including appropriate headings, units and scales. ○ All sources are referenced correctly in an agreed format	formulas and methods are mostly structured, clear to follow and correct ○ Most tables and graphs are well constructed ○ Most sources are referenced correctly in an agreed format	and correct. ○ Some tables and graphs are well constructed but contains some errors ○ Some sources are referenced correctly in the agreed format with occasional errors
	Language and Style	○ No spelling, grammar or punctuation errors ○ Units and significant figures are presented accurately throughout ○ Writing style consistently clear, appropriate for scientific documents and easy to follow ○ Accurate and consistent use of technical language and vocabulary	○ Minimal spelling, grammar or punctuation errors ○ Units and significant figures are presented accurately throughout ○ Writing style mostly clear, appropriate for scientific documents and easy to follow ○ Some attempts of using technical language and vocab alary, but not always accurate	○ Some spelling, grammar or punctuation errors ○ Units and significant figures are presented accurately throughout with occasional errors ○ Writing style moderately clear, appropriate for scientific documents and easy to follow ○ Use of simple language and vocabulary effectively but struggles to use technical language

Glossary of Keywords

Word	Definition	In your own words
Weather	The state of the atmosphere at a particular place and time as regards heat, cloudiness, dryness, sunshine, wind, rain, etc.	
Climate	Long-term pattern of **weather** in a particular area.	
Atmospheric	Relating to the atmosphere of the earth.	
Cloud	A visible mass of condensed watery vapor floating in the atmosphere, typically high above the general level of the ground.	
Probabilistic	Subject to or involving chance variation.	
Forecast	Predict or estimate a future event or trend.	
Probabilistic forecast	An estimation of the respective probabilities for all the possible future outcomes of a random variable.	
Meteorologist	An expert in or student of meteorology.	
Meteorology	The branch of science concerned with the processes and phenomena of the atmosphere, especially as a means of forecasting the weather.	
Humidity	the amount of water vapor present in the air.	
Pressure	The pressure within the atmosphere of Earth.	
Variables	An element, feature, or factor that is liable to vary or change.	
Condensation Nuclei	Small particles typically 0.2 µm, or 1/100th the size of a cloud droplet on which water vapor condenses.	

Weather forecast chart	A map on which data from synchronous weather observations are entered in the form of numbers and symbols.	
Isobars	A line on a map connecting points having the same atmospheric pressure at a given time or on average over a given period.	
Thermodynamic diagram	A chart depicting variations in atmospheric conditions relative to altitude.	
Forecast factory	A calculation or estimate of future events, especially coming weather or a financial trend.	
Weather phenomena	The different types of weather. Most weather phenomena occur in the troposphere.	
Jet stream	A narrow variable band of very strong predominantly westerly air currents encircling the globe several miles above the earth.	
Gulf Stream	A warm ocean current which flows from the Gulf of Mexico towards Canada, continuing across the Atlantic Ocean towards Europe.	

Tutorial 1 – What is weather?

"Climate is what we expect, weather is what we get"
– Mark Twain

What is the Purpose of Tutorial 1?

- To learn the difference between weather and climate
- To be able to identify different types of weather
- To learn about the different instruments that are used to measure weather variables

Activity 1 – The difference between weather and climate

1) Describe, in your own words, the definition of weather

_____

_____

_____

2) Describe, in your own words, the definition of climate

_____

_____

_____

3) For each of the 10 statements below classify them as weather or climate.

1. It snowed 5 cm last night _____
2. It has not rained this month yet_____
3. Typically, rainfall in June will be under 1 cm_____
4. This winter should be colder than normal_____
5. The pressure is falling_____
6. There is a thunderstorm warning for my area_____
7. It has never gone above 30°C in the month of May_____
8. The low temperature last night was 10°C above normal_____
9. The skies are clearing_____
10. Katrina was the strongest hurricane to hit New Orleans

_____

Activity 2 – Atmospheric variables and instruments

1) Write a short description about each of the instruments demonstrated

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

2) Choose one of the instruments and take measurements outside for 15 minutes. Use the table below to record your data.

Time (minutes)		Cloud Cover	Mood

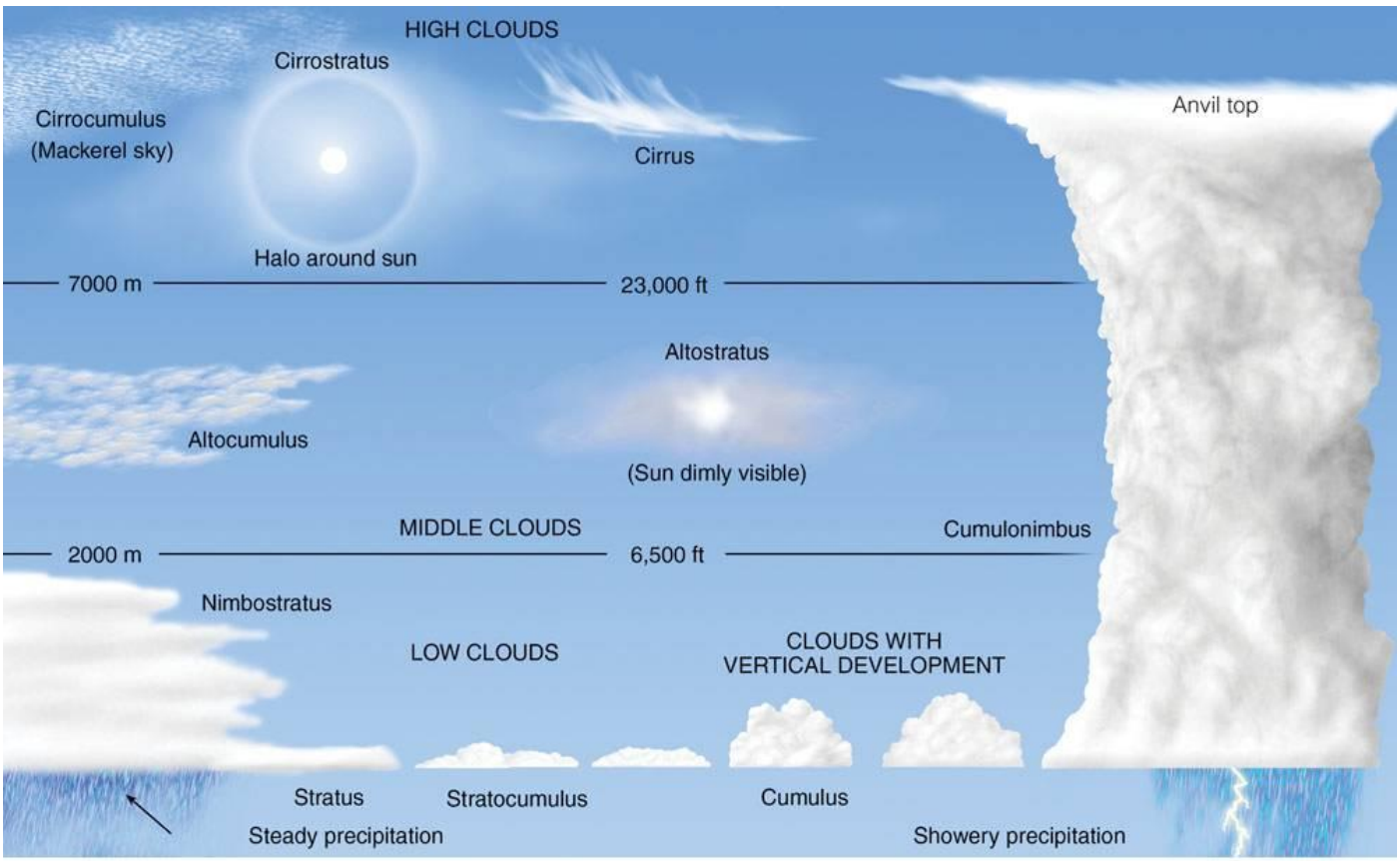
3) Why do we want to know about your mood when recording measurements?

4) How could we make our data more reliable?

Homework 1

Name as many different types of weather you can and chose one to describe in 300-words

Tutorial 2 – Clouds



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"How sweet to be a cloud floating in the blue"

– A. A. Milne

What is the Purpose of Tutorial 2?

- To gain an understanding of how clouds form
- To be able to describe the different types of clouds
- To understand the importance of clouds for our atmosphere
- To gain experience of developing scientific experiments

Activity 1 – How do clouds form?

1) In your own words, describe how clouds form in the atmosphere. Use any notes you made during the presentation.

2) Name the five main factors that can lead to air rising and describe them in one sentence.

Factor	Description

Activity 2 – Cloud types

1) What are the highest clouds in the atmosphere?

_____

_____

_____

2) Which clouds form in the middle of the atmosphere?

_____

_____

_____

3) What are the lowest clouds in the atmosphere?

4) Cumulonimbus clouds have a different characteristic to other clouds. Explain in your own words why they are different.

Activity 3 – Cloud in a bottle experiment

You have seen how a cloud can be created within a 2-litre bottle using the smoke from a match and some water. You now need to use the apparatus listed below to create your own cloud. There are several different possible cloud nuclei available however not everything will generate a cloud.

You need to:

- Plan your experiment, deciding on which nuclei you are going to test
- Make notes of your experiment, i.e. which nuclei did not generate a cloud, which nuclei created the whitest cloud, etc.

<u>Apparatus</u>

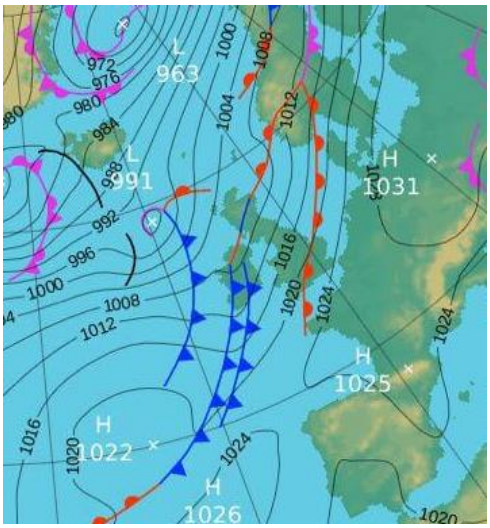
- 2-litre bottle
- Water
- Bung
- Pressure pump
- Cloud nuclei (i.e. smoke from a match, aerosol, etc)

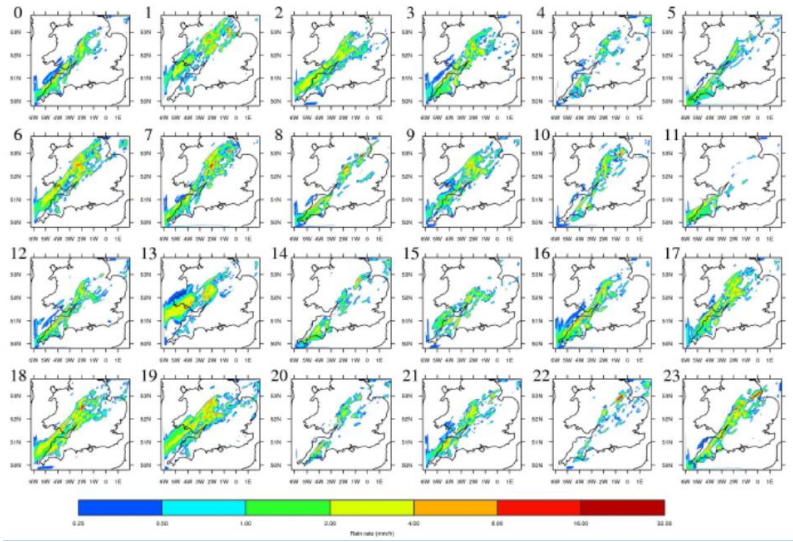
Homework 2

Write a short summary (300-words) about the role clouds play in our atmosphere and why they are important.

- Use any notes from class to help you along with the texts provided.
- See Appendix 1 for referencing if you decide to use the texts.

Tutorial 3 – Can we predict the weather?





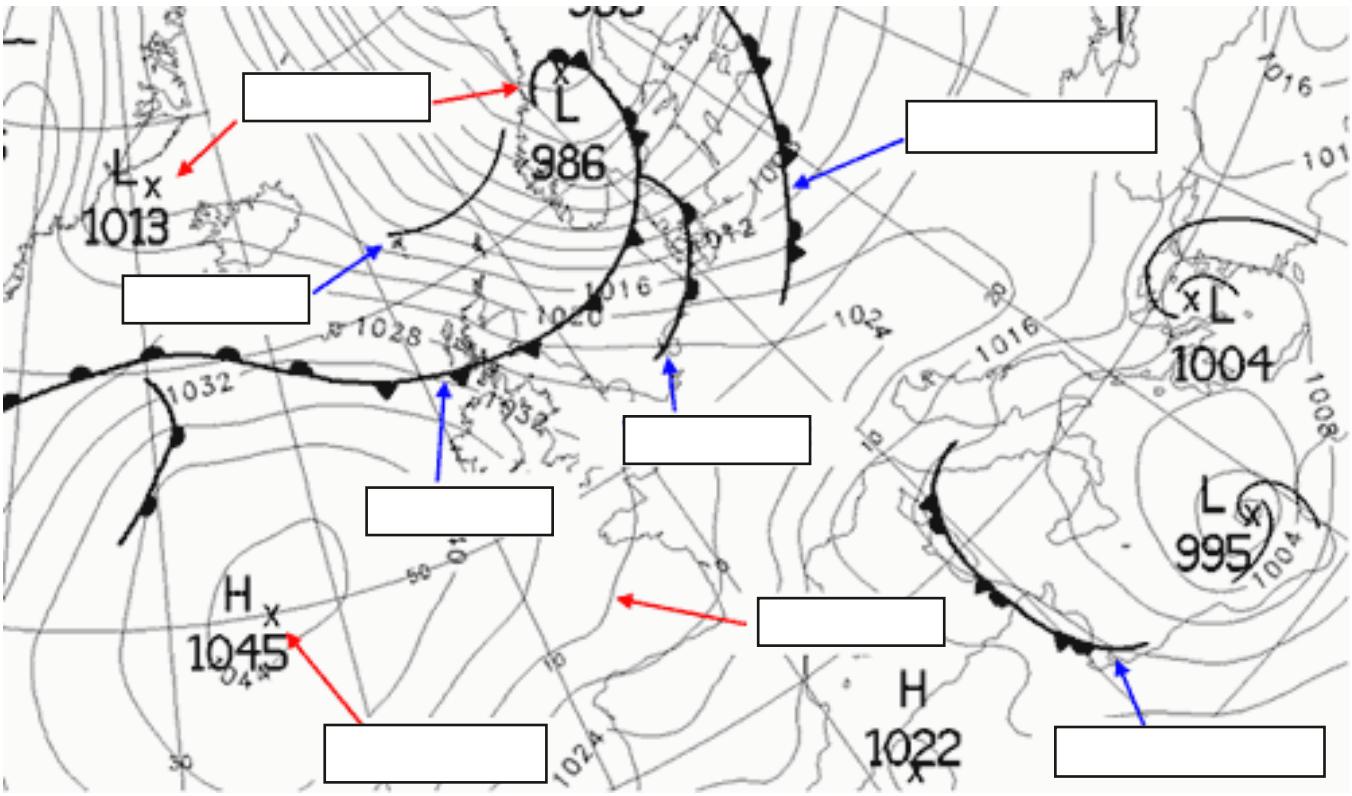
"Everyone talks about the weather, but no one does anything about it."
– Mark Twain

What is the Purpose of Tutorial 3?

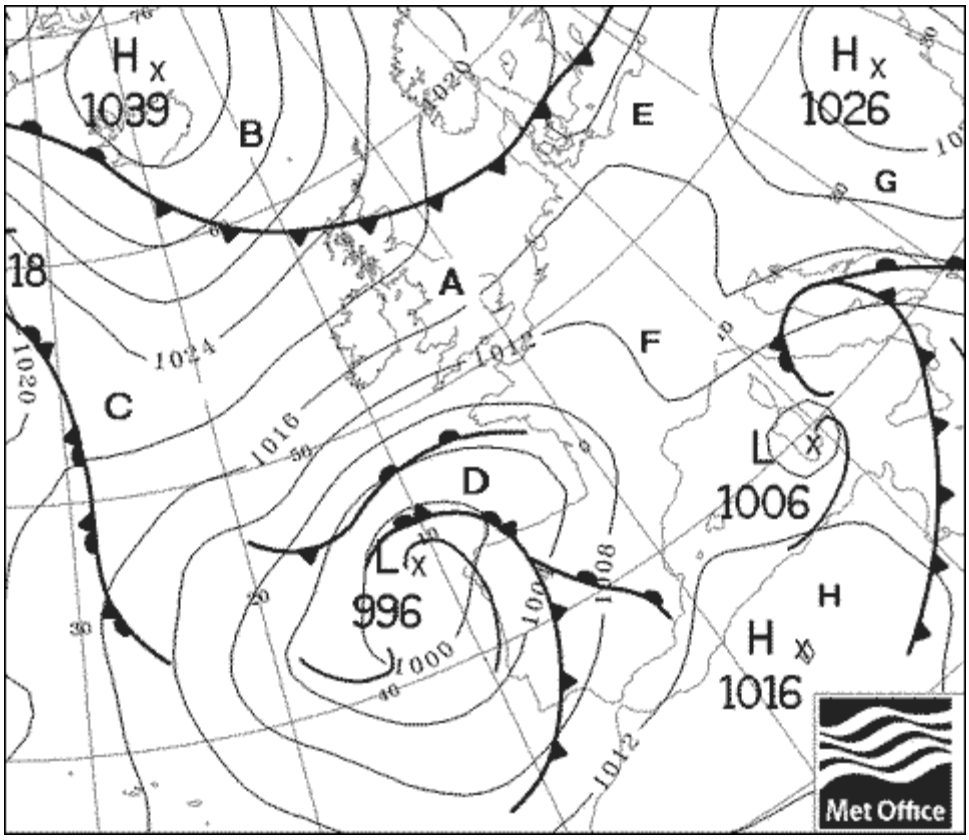
- To gain an understanding of how weather forecasts have been generated over time
- To learn how to draw and analyse a weather forecast chart
- To understand what a probabilistic forecast is
- To practice evaluating and analysing results from a scientific experiment

Activity 1 – Understanding a weather forecast

1) Label the features shown on the forecast analysis chart

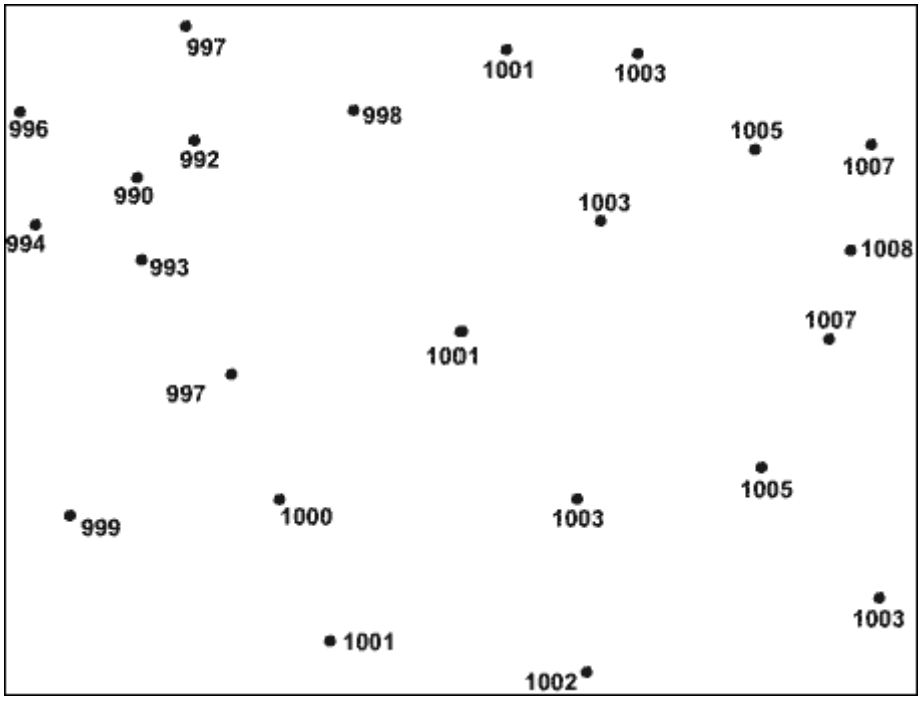


2) Study the chart, and complete the table below, by entering the approximate pressure at each of the labelled locations.



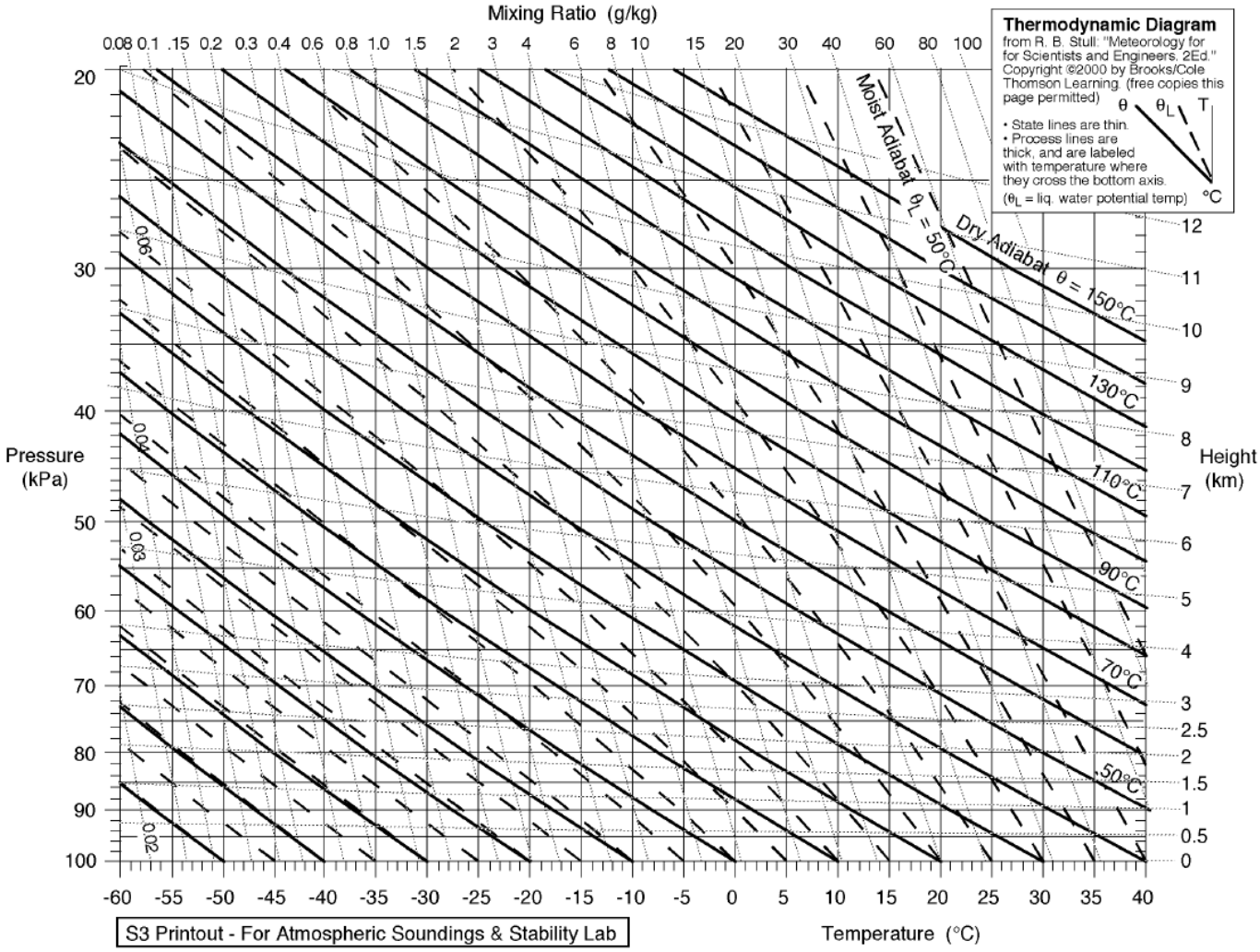
Location	Pressure (mb)	Location	Pressure (mb)
A		E	
B		F	
C		G	
D		H	

3) Complete the diagram by drawing isobars at intervals of 4 millibars, including 992, 996, 1000, 1004 and 1008.



4) Using the data in the table provided draw a thermodynamic diagram on the chart below.

Pressure (kPa)	Temperature (°C)	Dew Point Temperature (°C)
100	40	25
90	25	20
80	25	-5
65	10	-20
50	-10	-35
30	-30	-45
20	-30	-60



Activity 2 – Probabilistic forecasts

1) In your own words, describe what a probabilistic forecast is.

Homework 3

1) Find an example of a forecast chart for your area, write a short (100-word) summary on it and be ready to share it in class in the next lesson.

2) Write a report (500-words) or make a poster about the forecast factory experiment. Your work should at least cover the following points:
   - How successful was the forecast factory experiment?
   - How could the experiment have been improved?
   - What impact did a wrong value of temperature have on the rest of the forecast?

Tutorial 4 – UK weather

"The jet stream is the controlling influence over the world's weather systems."
– Michael Fish

What is the Purpose of Tutorial 4?

- To learn about the different types of weather phenomena that impact the UK
- To be able to describe an example of an extreme event in the UK that was not forecast

Activity 1 – Defining UK weather

1) Write down as many different UK weather phenomena that you know of.

2) In your own words, describe why the jet stream is important for UK weather?

3) Density tank experiment

4) In your own words, describe why the gulf stream is important for UK weather?

Activity 2 – Case Study: Boscastle

1) From the documentary, describe what extreme weather event lead to the events that occurred in Boscastle.

2) Is there any way in which this extreme event could have been prevented?

Homework 4

Research a different extreme weather event in the UK and either write a report (500-words) or make a poster about it.

If you wrote a report for Tutorial 3 please make a poster and vice versa.

Tutorial 5 – Why are weather forecasts important?

"One can't predict the weather more than a few days in advance."
– Stephen Hawking

What is the Purpose of Tutorial 5?

- To be able to explain at least three reasons why weather forecasts are important
- To understand ways in which we can improve weather forecasts
- To gain an understanding of how to present scientific data in a presentation

Activity 1 – Importance of weather forecasts

1) Write down at least three reasons why weather forecasts are important

2) Discuss is pairs and make notes on how you think we could improve the current method for forecasting the weather and warning people about extreme events.

Weather Forecasts

Warning of extreme events

Activity 2 – Group presentation

In groups of 4 you need to make a 12-minute oral presentation (in PowerPoint) on the topics covered within this course.

Each person in the group is required to present for 3 minutes.

The presentation should cover 4 different topics (ideally one per person) but the presentation must flow together.

This presentation is 20% of your final assignment mark.

Homework 5

1) Finish your group presentation on the course. This is going to be presented at the start of the feedback session as well as at the Uni Pathways Conference.

   The presentation should:
   - Be 12 minutes long (3 minutes per person)
   - Cover 4 different areas from this course

   20% of final assignment mark

2) Write an abstract for your 3 minutes of the presentation.

   The abstract should be 150 words long.

   Use the examples provided for guidance on how to write an abstract

   10% of final assignment mark

3) Write a report on why weather forecasts are important.

   The report should:
   - Be 1000 words long
   - Contain references (see Appendix 1 for more details)

   Think about including the following:
   - Examples of events that were not forecast and what impact that had
   - Ideas of how we can improve the forecast

   70% of final assignment mark

Tutorial 6 – Feedback tutorial

What is the Purpose of Tutorial 6?

- To receive feedback on final assignments.
- To share examples of best practice with the other pupils in your group.
- To write targets for improvement in school lessons.
- To reflect on the programme including what was enjoyed and what was challenging.

Final assignment feedback

What I did well…	What I could have improved on…
•	•
•	•
•	•

My target for future work is…

Reflecting on Uni Pathways

What did you most enjoy about Uni Pathways?
• • •

What did you find challenging about the programme?	How did you overcome these challenges?
• • •	• • •

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 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. 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.

Appendix 2 – Using the VLE

VLE username	
VLE password	

Please remember the following key details…

- You are able log into the VLE either through the link on our website (www.thebrilliantclub.org) or going directly to the VLE site at (https://portal.thebrilliantclub.org/sign-in).
- Please update your profile with your full name and email address- this will allow you to retrieve forgotten passwords or usernames
- If you forget your log-in details you can request them to be emailed to you by clicking the link on the VLE home page. (If you are still having problems you can email: schools@thebrilliantclub.org)

What is the VLE?

The VLE is a virtual learning environment for all pupils on Uni Pathways it is used for:

- messaging your tutor
- submitting homework
- submitting your final assignment
- accessing resources for your tutorials
- finding out more information about university and careers

How should I use the VLE?

The VLE is a professional academic environment in which pupils are able to message their PhD Tutor. Here are a few things to consider:

- Ensure you keep a professional tone in the messages you send to your tutors.
- Ensure you always reply to your tutors in a timely manner.
- Thank your tutor for the effort they are putting in to give you your feedback etc.
- Submit all homework to your tutor on time.

IMPORTANT: Final assignment

- When you submit your final assignment, please remember that you need to do so through the 'My Activities' tab and not as an attachment to a message.

Appendix 3 – Cloud wheel

The cloud wheel was created by the Royal Meteorological Society and it used to help people study the different types of clouds that form. It details the characteristics of the clouds such as colour, shape and height.

Notes

Notes

Notes

Why does it always rain on me?

Key Stage 4 Programme

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