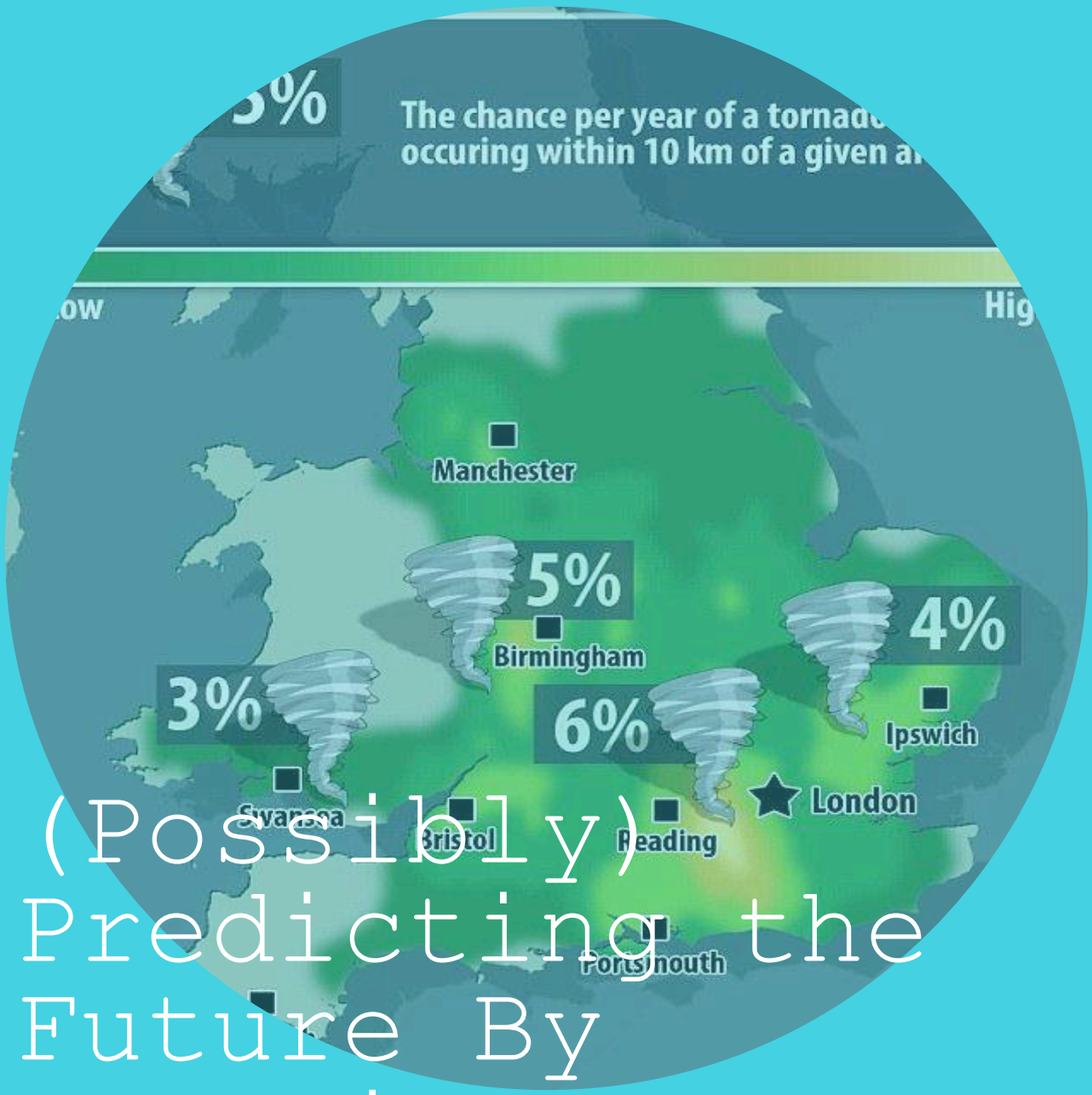

(Possibly) Predicting the Future By Counting

Key Stage 3, Year 9 Programme

Pupil Name	
Handbook Designed by	Dr Dungca

Timetable and Assignment Submission

Timetable – Tutorials

Tutorial	Date	Time	Location
1	12/12/2018	2PM	King's College London
2	17/12/2018	2:50PM	Springwest Academy
3	07/01/2019	2:50PM	Springwest Academy
4	14/01/2019	2:50PM	Springwest Academy
5	21/01/2019	2:50PM	Springwest Academy
6 (Feedback)	11/02/2019	2:50PM	Springwest Academy
7 (Feedback)	18/02/2019	2:50PM	Springwest Academy

Timetable – Homework Assignments

Homework Assignment	Description	Due Date
Tutorial 1	Baseline Assignment- Word Problems and Operations	18/12/2018
Tutorial 2	Permutations- Counting the Number of Distinct Combinations	08/01/2019
Tutorial 3	Probability Review and Probability Trees	14/01/2019
Tutorial 4	Bernoulli Trials and Random Walks	21/01/2019
Tutorial 5	Final Assignment- Counting and Probability Problems and Presentation	06/02/2019

Uni Pathways – 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 RIS teacher	Dr Dungca		
Title of Assignment			
Name of Pupil			
Name of School	Springwest Academy		
ORIGINAL MARK / 100		**FINAL MARK / 100**	
DEDUCTED MARKS		**FINAL GRADE**	

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

Knowledge and Understanding

Critical Evaluation/Problem Solving

Structure and Presentation

Resilience Comment

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Course Rationale

People think about the chances of events happening in daily life. For instance, what's the chance that it will rain tomorrow? You would look at an app like BBC weather to find the chance of rain. This number, called the probability, is between 0 and 1. Probability is a way of assigning a number to uncertainty. Probability is not just about adding or multiplying or Ed Sheeran album titles. To find the probability of an event, it is useful to count the total number of possible outcomes. We use combinatorics, mathematical counting techniques, to count these outcomes. That's why this course is called: (Possibily) Predicting the Future By Counting.

This course is designed to give you a glimpse into advanced topics on the GCSE, a preview into A Level Statistics, and a taste of university level probability. This course will help you prepare for your GCSEs and if you choose to pursue them, A Level maths and university. We will concentrate on finding the intuition behind probability and combinatorics. To do this, we discover and learn about concepts in these mathematical areas. We will have many interactive activities and discussions about the ideas of chance (probability) and counting (combinatorics).

First, we will learn about tree diagrams and counting rules. Then, we will learn the connections between a pattern, called Pascal's Triangle, and counting rules. The third tutorial will be a review of probability and an introduction to probability trees. The fourth tutorial will introduce Bernoulli trials (i.e. finding the probability of heads or tails after multiple coin flips) and a random walk (i.e. finding the probability of landing on a spot when you play monopoly). Finally, we review the content from this course in the final tutorial. There will be homework; however, it is not designed to be a chore. I will create homework that helps you like maths even more and practice concepts from each tutorial.

Mark Scheme

STEM Mark Scheme

Skills	1st (70-100)	2:1 (60-69)	2:2 (50-59)
Knowledge and Understanding	• All content included is relevant to the general topic and to the specific question/title • Good understanding of all the relevant topics. • Scientific terms are defined and used accurately throughout • Clear justification on how the content included is related to the specific issues that are the focus of the assignment	• Most of the content included is relevant to the general topic and to the specific question/title • Good understanding of most the relevant topics • Scientific terms are used accurately but not always clearly defined. • Adequate justification on how the content included is related to the specific issues that are the focus of the assignment	• Some of the content included is relevant to the general topic and to the specific question/title • Good understanding on some of the relevant topics but occasional confusion on others. • Scientific terms are used mostly accurately with occasional confusion and often not defined. • Some justification on how the content included is related to the specific issues that are the focus of the assignment
Critical Evaluation / Problem solving	• 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 • Consistently demonstrate clear, analytical and logical steps to solving problems	• 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 • Some examples of solving problems but not consistently clear, analytical and logical	• 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 • Demonstrate clear steps to solving problems but not consistently analytical or logical

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 • 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	• 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, 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	• 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 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

Success Criteria

University Pathways Success Criteria	Success Criteria for Homework and Assignments
Knowledge and understanding	Include the key words from the glossary and demonstrate that you understand them by explaining what they mean and how they relate to the topic. During your final presentation, explain the sources that you have drawn on and how they relate to your work. Remember to reference sources correctly.
Critical Evaluation/Problem Solving	Give reasons and evidence to show how you get your answer. Always show your work and explain your thinking. The steps should be written in order and neatly written. For any presentations, research must be properly cited.
Structure and presentation	For all assignments and homework, work should be done neatly. This is explained in the STEM Marking Crtieria. Make sure that your spelling, grammar and punctuation are accurate. Use a formal writing style that is appropriate for an academic presentation for the final assignment.

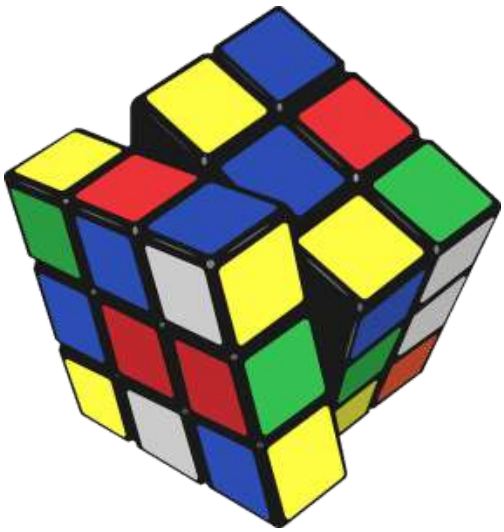
Subject Vocabulary (To Be Filled In Tutorials)

Word	Definition	In a sentence
Permutation		
Factorial		
n choose k		
Event		
Equally Likely		
Possibility Space		
Outcomes		
Complement		
Bernoulli Trial		

Knowledge Organiser

Rules	Examples (To Be Filled In During Tutorials)
The Multiplication Rule Multiply possibilities together to find the total combination	
Choosing k objects from n objects Use $\binom{n}{k} = \frac{n!}{k!(n-k)!}$	
Distinct Permutations Take a word with n letters Without repeating letters: n! With repeating letters: n!/(Number of times a letter repeats)!	
Probability Trees: Organises possibilities into a tree diagram. We write probabilities on its branches.	
Bernoulli Trials: A trial is an experiment like a coin flip. We use Bernoulli trials when we repeat trials or experiments.	
Random Walk: A walk or path determined by a probability trial like a coin flip.	

Tutorial 1 – The Power of Combination

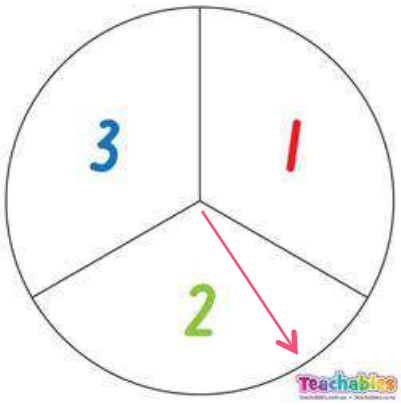


What is the Purpose of Tutorial 1?

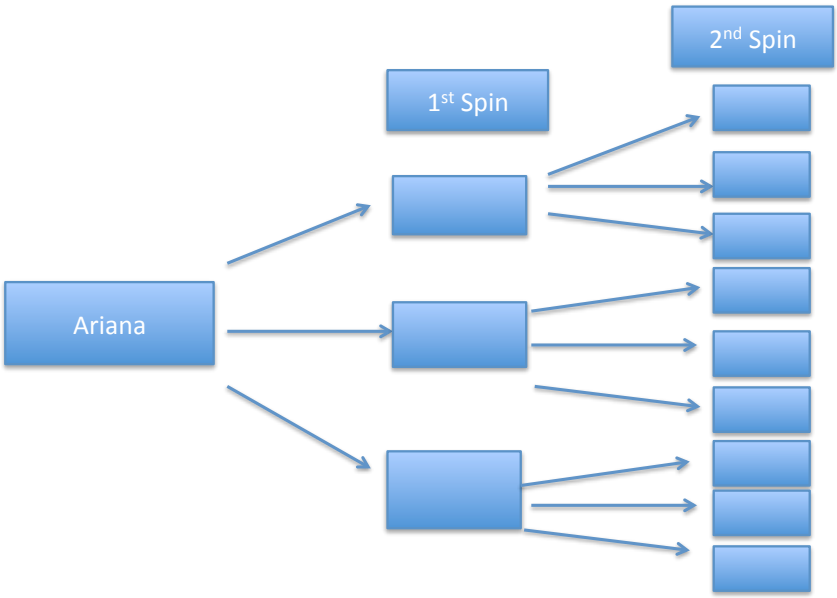
- To be able to construct tree diagrams
- To understand how tree diagrams connect to counting outcomes
- To discover and use the multiplication rule
- To discover and understand factorials

Activity 1: Tree Diagrams

1. Ariana spins a spinner which has the numbers 1-3 labelled. If Ariana spins the spinner 2 times, how many possible outcomes are there? Use a **tree diagram**.



Example: Tree Diagram



2. Pete spins a spinner which has the numbers 1-4 labelled. Then, he spins a spinner which has the numbers 1-3 labelled. How many possible outcomes are there? Use a **tree diagram** and list all the possible outcomes.

3. Is there an easier way to find the total number of possible outcomes in Problems 1 and 2? What operation might you consider using?

Activity 2: The Multiplication Rule

1. How many 9 digit numbers are there if you are allowed to repeat digits?

2. Find the total number of even 2 digit numbers. First, use a tree diagram to count the number of outcomes. Then, use the multiplication rule and compare both methods.

3. The final score in the football game between Chelsea and Tottenham was 6-2. How many different scores could have been possible before the match finished?
[For example: 5-1 could have been a score before the final minute.]

4. Steve rolls a 10 sided dice with the numbers 1-10 labelled on its sides. Then, he rolls a 7 sided dice with the letters A-G labelled on its sides. Finally, he spins a spinner that is divided into 5 pieces (labelled 1, 3, 5, 7, 9). What is the total number of outcomes?

5. Adele wants to sing at a city in England that starts with an A in January, a city in England that starts with a B in February, and a city in England that starts with a L in March. What is the total number of combinations of cities are there for her tour?

Homework 1: Baseline Assignment

This homework is designed to check for your understanding from the first tutorial. I will not give a mark, but I will give you feedback. You can use my comments to help you throughout the module. Activity 1 will relate to your study of a famous probability problem in the Final Assignment.

Activity 1: Paragraph

Write a paragraph on how probability can possibly predict the future. Explain how combination relates to probability. Explain how trials and outcomes are related to calculating chance. Discuss how tutorial 1 relates to your points and give real life examples to illustrate your points.

Activity 2: Problem Set

1. a) 2 x 5= b) 123 x 23= c) 9 x 8 x 7 x 6 x 5=

2. We define n!= n x (n-1) x (n-2) x … x 2 x 1

a) 6!= b) 7!= c)9!= d) $\frac{9!}{5!} =$

3. Let's say that you want to make a 4 digit password from the digits 0, 1, 2, 3, 4. How many 5 digit passwords are there if you are not allowed to repeat digits?

4. Steve has a Samsung phone, James has an I-Phone, and Kate has a Sony phone. Each of them can download the apps: Snapchat, Twitter, Whatsapp, or Facebook. How many combinations of phones and apps are there?

5. What are the mean, median, mode, and range of these numbers:
1, 1, 2, 3, 5, 8, 13, 21, 34?
What pattern do you see between the terms [hint: look at the first 3 terms]? Describe the pattern using words and/or mathematical language.

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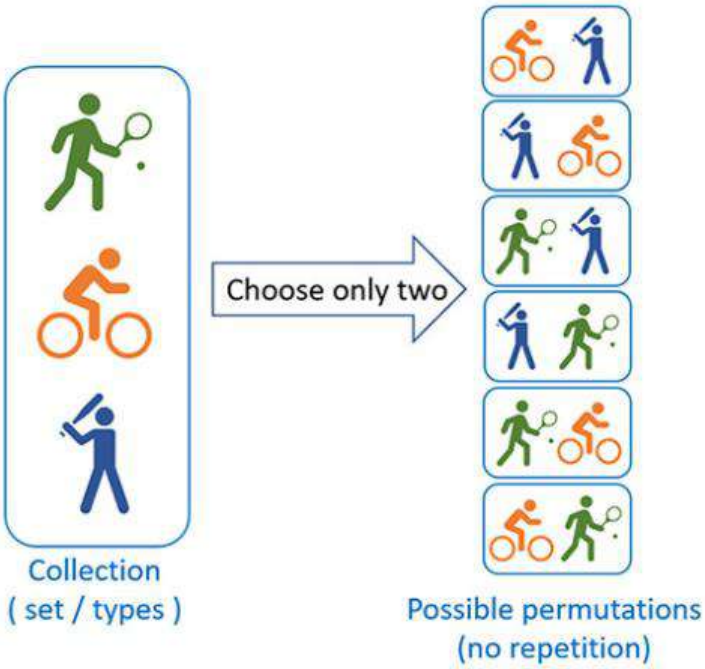
Tutorial 2 – The Power of Permutation



Is there a way to count the number of combinations without repetitions? In Tutorial 1, we found all possible combinations of objects. Now, we find combinations of objects, but we won't allow repetitions. These are called permutations. To continue from last tutorial, we will fill in the definition of a permutation.

What is the Purpose of Tutorial 2?

- To be able to find permutations of different and identical objects
- To understand and apply the meaning of "n choose k"
- To find multiple patterns from Pascal's triangle
- To connect Pascal's triangle to multiplying monomials

Activity 1: Permutations

1. How many anagrams of CAFE are there?

2. How many ways can you arrange 10 Youtubers in 10 chairs?

3. How many different 6 digit passwords can you make from the digits: 2,3,4,5,6,7?

4. How many anagrams of LOOP are there?

5. How many anagrams of DEPEND are there?

6. Challenge: How many ways can you arrange 10 singers in 6 chairs?

Activity 2: n choose k
Could an election be decided by a deck of cards?

1. a) $\binom{9}{3} =$ b) $\binom{5}{4} =$ c) $\binom{5}{1} =$

d) How are b and c related? Are their answers different or the same? Can you guess why this happens?

2. Jane has a 52 card deck. How many different ways can she pick 3 cards?

3. A school has 59 year 11s and 77 year 9s. Teachers will choose 4 year 11s and 2 year 9s to represent the school in a debate competition. How many possible choices do the teachers have?

Activity 3: Pascal's Triangle

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
1 7 21 35 35 21 7 1
1 8 28 56 70 56 28 8 1

1. What patterns do you see? I will give hints and then, we will discuss the various patterns.

2. How does the triangle relate to n choose k? Hint: Look at the rows. Start with the top row: row 0.

Homework 2: Permutations

1. Find the total number of anagrams made from the word CHOOSE.

2. Find the total number of anagrams made from the word COOL.

3. Find the total number of anagrams made from the word FROST.

4. There are 30 different pizzas in Pizza Express's menu. A group of fifty friends, including yourself, each choose a different pizza. How many different ways can they choose a pizza? Hint: Look at the word choose.

5. Liam has 50 possible new songs for his upcoming album. If he wants to pick 30 songs, how many different groups of 30 songs are there?

6. a) $\binom{10}{3}$ b) $\binom{10}{7}$ c) $\frac{\binom{10}{3}}{\binom{8}{6}}$

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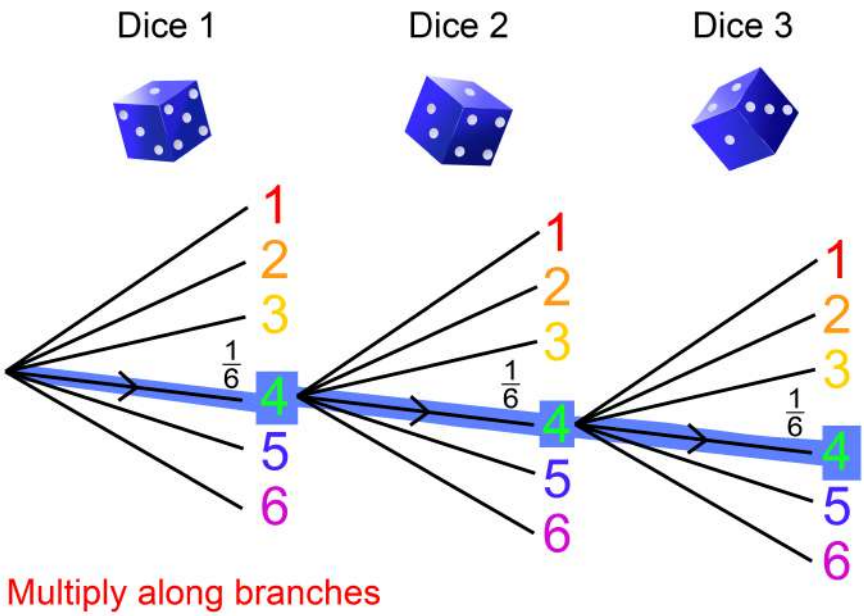
Tutorial 3 – Review and Probability Trees



How can we find the probability of consecutive events such as rain happening two days in a row? We will now use our understanding of permutations and combinations to find probabilities of consecutive events.

What is the Purpose of Tutorial 3?

- To Recall the Probability Scale and Define Expected Frequency
- To Be Able to Construct Probability Trees

Activity 1- Review and Interactive Activity

1. List the outcomes if I roll a 10 sided numbered dice.

2. a) If I roll a 6 sided numbered dice once, what is the probability of rolling a 1?

b) How about the probability of rolling a 6?

c) What's the probability that I do not roll a 6?

3. Recall the probability of rolling a 6. What is the expected frequency for rolling a 6? Roll two 6 sided giant dice six times. Use the table to record the values:

Roll Number	Value

Does the number of times you got a 6 match the expected frequency? Why or why not? Would rolling the dice more and more times give you the expected frequency? What happens if you roll the dice 12 times instead?

4. The faces of a 6 sided dice are numbered 1,1,2,2,3,3.
a) What is the probability that you roll a 2?

b) What is the probability that I do not roll a 2?

b) What is the probability that I do not roll a 2 or a 3? What is the probability that I roll a 2 or a 3?

Activity 2- Probability Trees

1. Pete spins a spinner which has the numbers 1-4 labelled. Then, he spins a spinner which has the numbers 1-3 labelled.
   a) What is the probability that he spins a 3 on the first spin and a 2 on the second spin?
   b) What is the probability that he spins a 3 on both spins?
   c) What is the probability that he spins a 1 on the first spin and he does not spin a 3 on the second spin?

2. Calum flips a 50p coin. He can either get a head (H) or tail (T).
   a) What is the probability that he gets two heads in a row?
   b) What is the probability that he gets a head and then, a tail?
   c) What is the probability that he gets three heads and a tail?

3. Jake rolls a 12 sided dice. Its sides are labelled 1,1,2,2,3,3,4,4,5,5,6,6.
   a) What is the probability that Jake rolls a 4 and then a 5?
   b) What is the probability that Jake rolls a 2 and then a 3?
   c) What is the probability that Jake rolls a 1 and then a number that's bigger than 6?
   d) What is the probability that Jake does not roll a 1 and then, rolls a 3?

Challenge Problem:

4. A package of sweets has 3 Milky Ways, 2 Bounties, 4 Twix, and 7 Kit-Kats.
   Steve picks two sweets.
   a) What is the probability that Steve picks a Milky Way and then, picks another Milky Way?
   b) What is the probability that Steve picks a Milky Way and then, picks a Twix?
   c) What is the probability that Steve picks a Kit-Kat and then, a Twix?

Homework 3- Review and Probability Trees

1. Shawn rolls a 10 sided dice once.

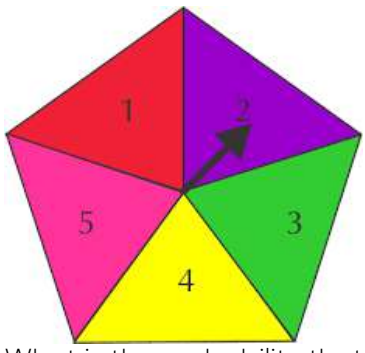
i) What is the probability that he rolls:

a) a 3?

c) an 8?

ii) What is the probability that he does not roll a 3?

2. Here is a 5 sided spinner.



a) Tom spins the spinner twice. What is the probability that he spins a 2 and then, a 5?
b) Hannah spins the spinner twice. What is the probability that she spins a 4 and then, a 2?
c) Nathan spins the spinner three times. What is the probability that he spins a 5 three times in a row?
d) Dua spins the spinner four times. What is the probability that she spins a 2 three times and then, a 5?

3. A package of sweets has 5 Milky Ways, 4 Bounties, 3 Twix, and 2 Kit-Kats.
   Steve picks two sweets.
   a) What is the probability that Steve picks a Milky Way and then, picks another Milky Way?
   b) What is the probability that Steve picks a Milky Way and then, picks a Twix?
   c) What is the probability that Steve picks a Kit-Kat and then, a Twix?

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Tutorial 4 – The Bernoulli Process and Random Walks

We will now discuss more advanced topics. How would you find the probability of a success and a failure? Jacob Bernoulli was an 18th Century Swiss Mathematician who developed an idea called Bernoulli trials. This involves finding the number of successes (or failures) when a trial or action is repeated.

What is the Purpose of Tutorial 4?

- To identify and calculate probabilities for Bernoulli trials
- To understand random walks and real life examples of them
- To calculate probabilities in a random walk

Activity 1-Bernoulli Trials

1. If the probability that Steve downloads Snapchat is 0.3, calculate the probability that he does not download Snapchat.

2. Kate flips a coin four times. Each time, the probability that she flips a head (H) is 0.75.
a) What's the probability that she does not flip a head [or flips a tail (T)]?
b) What's the probability that she flips 3 heads and then 1 tail?
c) What's the probability that she flips 4 tails?

3. The probability of Arsenal winning a match is 0.65. They play 5 matches.
a) Find the probability that they win 2 matches out of 5.
b) Find the probability that they win all 5 matches.
c) Find the probability that they lose at least 2 out of 5 matches.

Challenge:
4. Harry rolls a 12 sided dice with sides numbered 1-12.
a) Find the probability that he rolls a 6.
b) Find the probability that he does not roll a 6.
c) He rolls the dice 7 times. Find the probability that he rolls a 6 three times and does not roll a 6 the other two times.
d) He rolls the dice 7 times. Find the probability that he rolls a 6 at least three times.

Activity 2-Random Walk

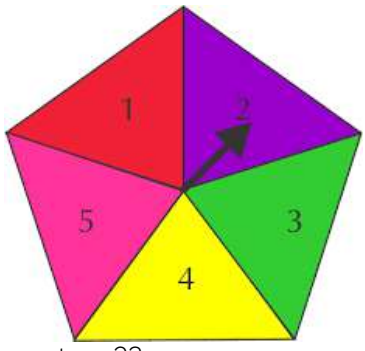
1. I will give you a number line. Let's make a tree diagram together. Three of you stands at 0. Each of your partners flips a coin. If you get heads you go one step forward (+1) and if you get tails you go one step backward (-1).
   Let's see who gets to 10 first.

Use probability trees to solve these problems.

2. Let's say that you flip the coin once. What's the probability that you go one step forward (+1)? What's the probability that you go one step backward (-1)?
3. Let's say you flip the coin twice. What's the probability that you go back to 0? What's the probability that you're at 1? What's the probability that you're at -1? What's the probability that you're at 2? What's the probability that you're at -2?
4. What are the probabilities when you flip the coin three, four, or five times?

Homework 4- Bernoulli Trials and Random Walk

1. Troye spins a spinner. The spinner is labelled with the numbers 1-5.



a) What's the probability that he gets a 2?
b) What's the probability that he does not get a 2?
c) Troye spins the spinner 5 times. What's the probability that he gets a 2 four times and does not get a 2 on the fifth time?
d) Troye spins the spinner 5 times. What's the probability that he gets a 2 at least four times?

2. The probability that Rihanna will win a Grammy is 0.55. She is nominated for 5 awards.
a) Find the probability that she wins 3 awards out of 5.
b) Find the probability that she win all 5 awards.
c) Find the probability that she loses all 5 awards.

3. Steve rolls an 8 sided dice with sides numbered 1-8.
   a) Find the probability that he rolls a 7.
   b) Find the probability that he does not roll a 7.
   c) He rolls the dice 9 times. Find the probability that he rolls a 7 three times and does not roll a 7 the other two times.
   d) He rolls the dice 9 times. Find the probability that he rolls a 7 at least three times.

4. What's the furthest away you can be from 0 if you flip a coin 100 times and take a random walk?

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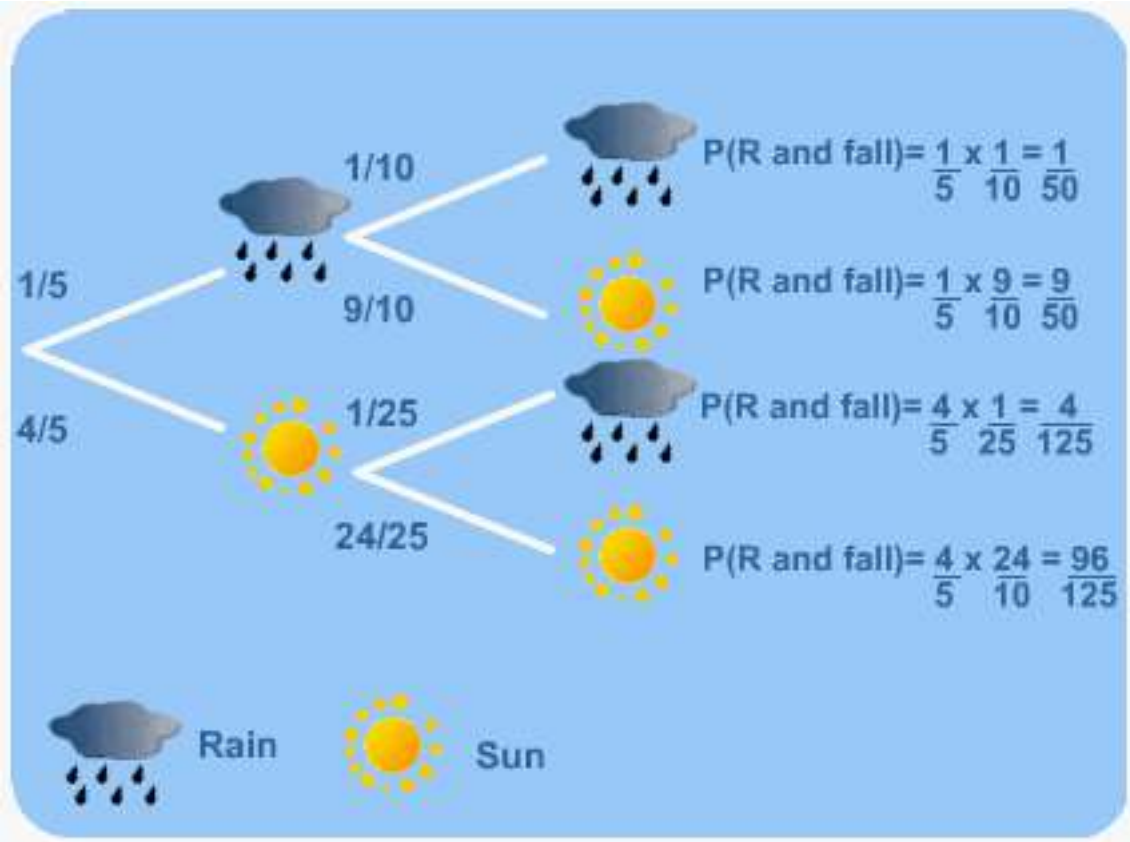
Tutorial 5 – Combinatorics and Probability Review



How are combinations and probability related? Does probability really possibly predict the future?

What is the Purpose of Tutorial 5?

- To Review Permutations and the Counting Rules
- To Review Probability and Probability Trees
- To Further Understand How to Calculate Bernoulli Probabilities
- To Discuss and Understand Random Walks

Activity 1- Permutations

1. Harry Potter, Shrek, Liam Payne, and Mark Zuckerberg stand in a line together. How many different ways can they stand in line together?

2. How many anagrams of DEPEND are there?

3. A few singers, like Selena Gomez, are playing musical chairs. How many ways can you arrange 12 singers in 6 chairs?

4. Solve $\binom{10}{1}=\binom{x}{9}$. X=

Activity 2- Probability Review and Probability Trees

1. Paul Hollywood has a box of cookies, or ahem, biscuits. There are 3 dark chocolate, 5 dark chocolate, 2 hazelnut, and 5 peanut butter biscuits.

a) What is the probability that he chooses a dark chocolate biscuit?
b) What is the probability that he does not choose a dark chocolate biscuit?

2. Zayn flips a 10p coin. He can either get a head (H) or tail (T).

a) What is the probability that he gets two tails in a row?
b) What is the probability that he does not get two tails in a row?
c) What is the probability that he gets a head and then, a tail?
d) What is the probability that he gets three heads and a tail?

3. A package of sweets has 5 Snickers, 3 Jelly Babies, 1 Kit-Kat, and 1 Cookies and Crème Bar. Steve picks two sweets.
   a) What is the probability that Steve picks a Snicker and then, picks another Snicker?
   b) What is the probability that Steve picks a Snicker and then, picks a Jelly Baby?
   c) What is the probability that Steve picks a Kit-Kat and then, a Cookies and Crème Bar?

Activity 3- Bernoulli Trials

1. If the probability that David does not download Facebook Messenger is 0.2, calculate the probability that he does download Facebook Messenger.

2. Phillip flips a coin five times. Each time, the probability that he flips a tail (T) is 0.125.
   a) What's the probability that he does not flip a tail [or flips a head (H)]?
   b) What's the probability that he flips 3 heads and then 2 tails?
   c) What's the probability that he flips 5 tails?

3. Steve rolls a 10 sided dice with sides numbered 1,1,2,2,3,3,4,4,4,4.
   a) Find the probability that he rolls a 4.
   b) Find the probability that he does not roll a 4.
   c) He rolls the dice 9 times. Find the probability that he rolls a 4 three times and does not roll a 4 the other two times.
   d) He rolls the dice 9 times. Find the probability that he rolls a 4 at least three times.

Final Assignment

We will discuss the Success Criteria (see Page 8) for the final assignment during this tutorial. Furthermore, I will explain how you can succeed in completing this assignment to a high standard and relate this to the Baseline Assignment.

Part 1: Problem Set

1. Find the total number of odd 3 digit numbers. Use the multiplication rule.

2. Ron Weasley, Ellen, Homer Simpson, Jeremy Kyle, and Beyonce stand in a line together. How many different ways can they stand in line together?

3. A few actors, like Eddie Redmayne, are playing musical chairs. How many ways can you arrange 15 singers in 8 chairs?

4. A package of sweets has 3 Maltesers, 4 Jelly Babies, 2 Kit-Kats, and 1 Peanut Butter Cup. Jacob picks two sweets.
   a) What is the probability that Jacob picks a Malteser two times in a row?
   b) What is the probability that Jacob does not pick a Malteser two times in a row?
   c) What is the probability that Jacob picks a Malteser and then, picks a Jelly Baby?
   d) What is the probability that Jacob picks a Kit-Kat and then, a Cookies and Crème Bar?

5. Steven flips a coin seven times. Each time, the probability that he flips a tail (T) is 0.06125.
   a) What's the probability that he does not flip a tail [or flips a head (H)]?
   b) What's the probability that he flips 3 heads and then 2 tails?
   c) What's the probability that he flips 2 heads and then 3 tails?
   d) What's the probability that he flips 5 heads?

Part 2: Presentation

You will give a 10-15 minute presentation with a partner on a famous problem in probability. You can choose either to present: The Monty Hall Problem, The Birthday Paradox, and The Handshake Problem. I will give a few handouts on these problems. You can use additional research on the internet to understand the problem.

Notes

Notes

Notes

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...

Tutorial 7 – Feedback tutorial

What is the Purpose of Tutorial 7?

- 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 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.

(Possibly) Predicting the Future By Counting

Key Stage 3, Year 9 Programme

researchersinschools.org