**Y13 A level Mathematics**

**36 Probability 1 week**

## Teaching objectives

**a** Understand and use mutually exclusive events and independent events and associated notation and definitions

**b** Be able to use Venn diagrams to assist in the calculations of probabilities.

**c** Know how to calculate probabilities for two events which are not mutually exclusive

**d** Understand and use conditional probability, including the use of tree diagrams, Venn diagrams and two-way tables

**e** Understand and use the conditional probability formula

**f** Know that P(B|A) = P(B) ⇔ B and A are independent

**g** Modelling with probability, including critiquing assumptions made and the likely effect of more realistic assumptions

**Resources for advance preparation:**

Information about Sally Clark to share with students – perhaps a handout or a PowerPoint with the key points as using the website as it stands gives too much away and doesn’t allow students to think things through for themselves.

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|  | **Starter** | **Main teaching**  Including key questions, key teaching points, models and resources | **Notes**  Including Support and Extension | **Consolidation/Plenary**  Including key questions and homework |
| 1 | Discuss the case of [**Sally Clark**](https://understandinguncertainty.org/node/545)  Students should be able to identify the independence issue themselves. | Continue the discussion to introduce the idea of Conditional Probablity and emphasise its importance.  If you didn’t use the [**Integral: Activity 3: Matching activity**](https://2017.integralmaths.org/mod/book/view.php?id=914&chapterid=90) in y12 (from the AS resources), then use it here, to check that students are secure with the notation.  [**Integral: Activity 2: Venn diagram**](https://2017.integralmaths.org/mod/book/view.php?id=8174&chapterid=826)  This works particularly well if you do a human Venn Diagram with large loops of string. Choose categories which will motivate and/or amuse the class. |  | Formalise the notation and the formula.  **Homework:** Routine practice from old resources, or [**Integral Exercise level 1**](https://2017.integralmaths.org/pluginfile.php/37889/mod_resource/content/0/meia2sp1ax_level1.pdf) |

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|  | **Starter** | **Main teaching**  Including key questions, key teaching points, models and resources | **Notes**  Including Support and Extension | **Consolidation/Plenary**  Including key questions and homework |
| 2 & 3 | Use [**Integral: Notes and Examples**](https://2017.integralmaths.org/pluginfile.php/37891/mod_resource/content/0/meia2sp1n.pdf) Example 2 to get students to present the information in a 2-way table and a Venn diagram, and then to solve the problem using these 2 methods and also with the formula | Look at the formula for conditional probability and discuss what happens in the case where A and B are independent.  **Highlight the important result that A and B are independent if and only if P(A and B) = P(A) x P(B).**  Exam problems are often based on this crucial idea.  [**Integral: Activity 1: interpreting probability questions**](https://2017.integralmaths.org/mod/book/view.php?id=8174&chapterid=826) or [**Integral: Activity 4: hexagonal jigsaw**](https://2017.integralmaths.org/mod/book/view.php?id=8174&chapterid=826) both give routine practice. |  | **Homework:** Routine practice from old resources, or [**Integral Exercise level 2/3**](https://2017.integralmaths.org/course/view.php?id=32&sectionid=809) |
| 4 |  | Making Statistics Vital has some useful resources for further challenge:  [**MSV32: Biassed Dice Independence**](http://www.s253053503.websitehome.co.uk/msv/msv-32.html)  [**MSV27: Random Independence**](http://www.s253053503.websitehome.co.uk/msv/msv-27/msv-27.pdf) |  |  |