

Session Plan: How is conditional probability used in insurance?

Logistics of the session

Title of session	How is conditional probability used in insurance?
Session objective	To understand and use conditional probability.
Success criteria	To understand and use conditional probability, including the use of: <ol style="list-style-type: none"> 1. Triple Venn diagram 2. Tree diagram 3. Two-way tables
Resources	<ul style="list-style-type: none"> • PowerPoint: Mathematics – Conditional Probability

Plan of activities

Activity	Description of activity	Time
Starter Fill in the gaps	The starter contains two sentences with 5 gaps that the students need to fill. The 5 words used to fill the gaps are provided at the bottom of the screen. Students should write the sentences in their books. Ask a selection of students to provide the answers to the 5 missing words.	5 mins
Success criteria #1 Three categories	<ol style="list-style-type: none"> 1. If students are already familiar with using triple Venn diagrams, ask them to attempt the first question, and then talk through the steps for the first question. If students are not familiar with triple Venn diagrams, talk them through the steps for the first question. 2. The students are then given a second question to answer independently. Ask students for their answers. If a student has given the correct answer, you can ask them to share their steps with the class. 3. Some students may forget the final step to ensure that the probability has been found and not the number of people with policy B. Highlight the importance of re-reading the question once they believe they have found the answer. 	15 mins
Success criteria #2 Dependent events	<ol style="list-style-type: none"> 1. Conditional probability for dependent events requires the use of tree diagrams. In pairs, students will be asked to work through the first question. You can then work through the steps to solve the question with the class. Ask the students to raise their hands if they also got the answer as b) 0.53. 2. Students will then work independently to apply this method to another question. Ask the class if they got the answer: a, b, c, d or, e. Select another student who got the correct answer to explain the steps they took to get there. 	15 mins
Success criteria #3 Two categories	<ol style="list-style-type: none"> 1. Two-way tables can be used to work out questions on conditional probability with two categories. Ask the students to think – pair – share their ideas for how to solve the example. They will be using the two-way table method for these questions. Ask the class which two categories are in the question. Show them on the next slide how to layout the table. Explain how algebraic variables can be used to assist with unknown values. An algebraic variable should ideally be on its own in the part of the table that reveals the solution, such as the female smokers in this example having the algebraic variable 'y'. Go through the steps to create and solve the question using the two-way table. 	20 mins

Activity	Description of activity	Time
	2. The students are then presented with three different questions. If there is enough time, ask the students to attempt each question. If there is not enough time, you can use this as a differentiation activity where students can select the level of difficulty that they are comfortable with.	
Wrap-up Create your own question	The final activity is for the students to choose a template of a triple Venn diagram, tree diagram or two-way table question format and create their own questions. If there is enough time, the students can give this to another student to solve.	5 mins