Lesson 9 Overview

Using frequencies and probabilities

Activity	Time (min)	Description/Prompt	Materials
Introduction	10	Introduce the context of developing self-administered tests to detect whether or not someone has a particular disease and trialling them to see how successful they are at giving a correct diagnosis. Give each student one of the 'Cards' and ask them to place their card in the right place in the 'Lab trial results' table. Involving every student in creating a table of results in this initial activity can help to encourage the belief that all students have something to contribute. Ask students how else the data could be represented and introduce the frequency tree diagram.	'Cards' and 'Lab trial results' handout (A3) Calculators Slides 2–6
Explore/ Discuss 1	10	Tell students that an official trial involving more participants is carried out. Ask students to complete a frequency tree diagram for the results and emphasise the mathematical structure of frequency tree diagrams. Introduce the probability tree diagram and encourage students to make connections with other areas of mathematics by exploring links with rounding and approximation when creating probability models.	Mini whiteboards Calculators Slides 7–11
Explore 2	15	Introduce scaling up for a bigger population. Ask students to work in pairs to complete the frequency tree and probability tree diagrams on the 'Scaling up' handout and to use the probabilities to scale up for 10 000 people. Encourage students to explain their thinking to each other as they complete the rows of the table to promote a collaborative approach.	'Scaling up' handout Calculators Slides 12–13

Discuss 2	10	Once students have had sufficient time on the task, hold a class discussion. Ask students to explain how they determined the missing values in the probability tree diagrams and explore some common misunderstandings. Emphasise the mathematical structure of a probability tree diagram.	Slides 14–15
Explore/ Discuss 3	10	Introduce the new context of sporting injuries and explore why we multiply along the branches of a probability tree diagram.	Calculators Slides 16–18
Explore 4	15	Give each pair of students a copy of the 'Using probabilities' handout. Ask them to work in pairs to complete missing values on the probability tree diagrams for two different types of injury and use the probabilities to identify how many people we would expect to have two injuries in a year. Encourage students to explain their thinking to each other. As students apply their understanding to different contexts, their fluency and grasp of the key ideas can be developed.	'Using probabilities' handout Calculators Slide 19
Discuss 4	10	Hold a class discussion. Discuss the pre-prepared solution with a possible mistake and check students' existing knowledge and understanding. Establish the correct solutions. Bring students' thinking together by asking them to identify statements as being true or false. When discussing the statements emphasise the key understanding that students should have.	Calculators Mini whiteboards Slides 20–23
Practice questions/ Discuss 5	10	Distribute to each student a copy of the 'Practice questions' handout and give them a couple of minutes to work on the questions individually. Encourage students to note down any calculations they use. Discuss students' thinking when completing the questions and check their understanding that in probability tree diagrams the probabilities on each pair of branches should always add to one.	'Practice questions' handout Calculators Slides 24–25