



Mathematics

lesson 5 – Student worksheet

GCSE Higher

Learning aim:

To determine theoretical probabilities based upon experimental data.

Scenario:

For the modern business, staff retention is crucial to ensure the continued success of a company. Fatima is the Human Resources Manager at a national bank. She is analysing some of the offices' staff satisfaction and wellbeing data, in preparation for a presentation she will be delivering to bank executives.

Career spotlight:

Human Resources (HR) Managers develop, deliver and manage HR policies and procedures. They lead an organisation's HR team and support other managers to get the best out of their staff by assessing training and development needs. They need to work well with others, with sensitivity and understanding. Strong communication skills are essential.

Activity 1:

Answer the questions below to help Fatima prepare for the presentation.

Question 1: In the Bristol branch, 70% of employees are happy at work, and 30% are unhappy. If you randomly select an employee, what is the probability that they are happy at work?

Question 2: Among the happy employees in Bristol, 60% attribute their happiness to a good work-life balance, while the remaining 40% attribute it to job satisfaction. Create a probability tree diagram for this scenario.

Question 3: Using the probability tree diagram from Question 2, if you randomly select an employee, what is the probability that they are happy at work due to job satisfaction?

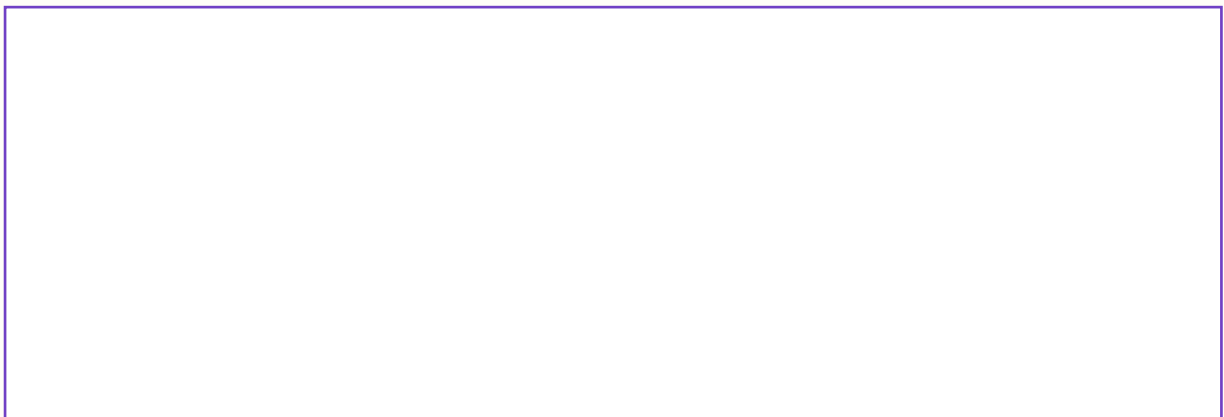
Question 4: In the same scenario as Bristol in Question 2, what is the probability that an employee is unhappy at work?

Question 5: Suppose 40% of employees are unhappy at work because of a heavy workload. In this case, what is the probability that an employee is unhappy at work due to reasons other than a heavy workload?

Question 6: In the Birmingham branch, 80% of employees are happy at work, and 20% are unhappy. Among the happy employees, 70% attribute their happiness to supportive management. Create a probability tree diagram for this company's situation.

A large, empty rectangular box with a thin purple border, intended for the student to draw a probability tree diagram.

Question 7: Using the probability tree diagram from Question 6, what is the probability that an employee is happy at work due to supportive management?

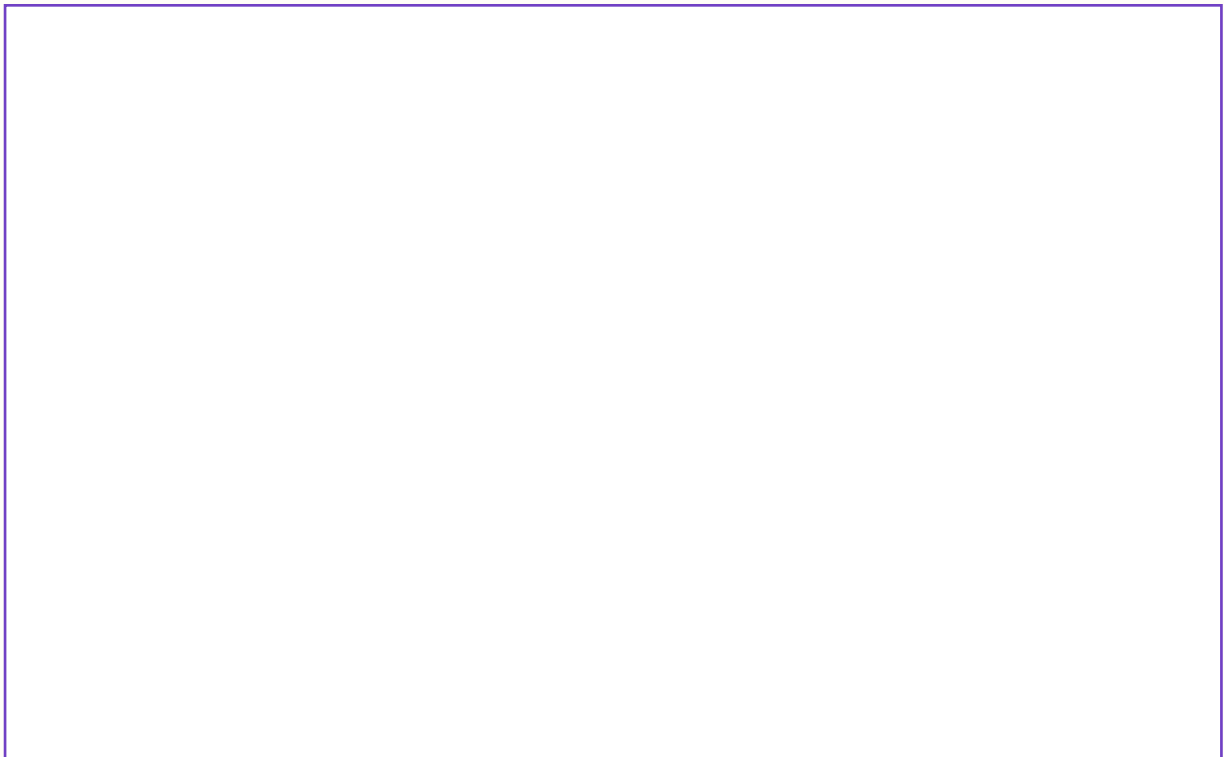
A large, empty rectangular box with a thin purple border, intended for the student to write the answer to Question 7.

Question 8:

In the same company as Question 6, what is the probability that an employee is unhappy at work?

A large, empty rectangular box with a thin black border, intended for the student to write their answer to Question 8.

Question 9: In the London office, 65% of employees are happy at work. Among the happy employees, 45% attribute their happiness to job security. For unhappy employees, 60% believe it's because of a lack of career growth. Create a probability tree diagram for this company's situation.

A large, empty rectangular box with a thin black border, intended for the student to draw a probability tree diagram for Question 9.

Question 10: Using the probability tree diagram from Question 9, what is the probability that an employee is unhappy at work due to a lack of career growth?

Question 11: What is the probability that an employee is happy at work in the London office?

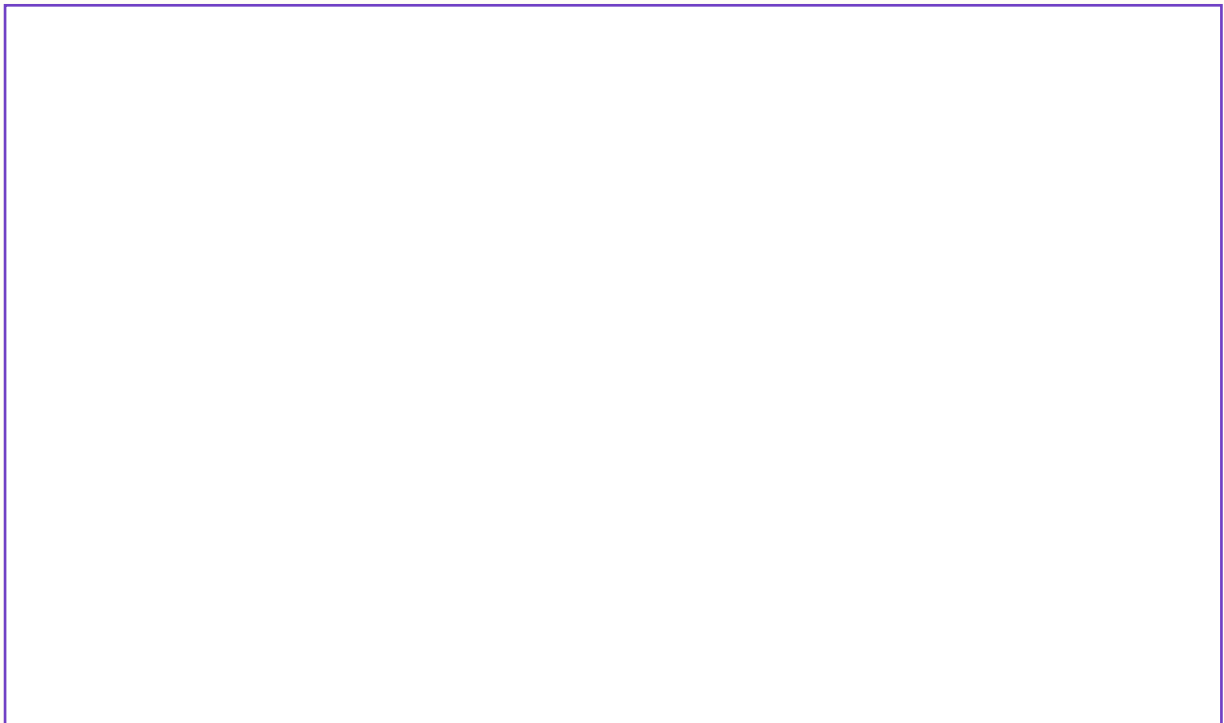
Question 12: Suppose you combine the data from all three questions mentioned above. If you randomly select an employee from this combined dataset, what is the probability that they are unhappy at work?

Question 13: In Brighton, 75% of employees are happy at work. Among the happy employees, 80% attribute their happiness to a positive work environment. If you select an employee at random from this company, what is the probability that they are happy at work due to a positive work environment?

Question 14: In the Brighton office mentioned in Question 13, what is the probability that an employee is unhappy at work?

A large, empty rectangular box with a thin black border, intended for the student to write their answer to Question 14.

Question 15: In Liverpool, 50% of employees are happy at work, and 50% are unhappy. Among the happy employees, 60% attribute their happiness to a supportive work culture. Create a probability tree diagram for this scenario.

A large, empty rectangular box with a thin black border, intended for the student to draw a probability tree diagram for Question 15.

Question 16: Using the probability tree diagram from Question 15, what is the probability that an employee is happy at work due to a supportive work culture?

Question 17:

In the same scenario as Question 15, what is the probability that an employee is unhappy at work?

Activity 2:

Help Fatima create a 2-minute presentation to the bank executives, drawing together the answers to the questions above. In the presentation, you will need to include:

- What the purpose of this research was.
- Key data from the probability tree that you think is most impactful.
- Key comparisons of the offices in the UK.
- Conclusions you can draw from the data.
- What you think the company should do next based on the data (for example, conduct another round of research to find out what makes people unhappy at work).

When you deliver the presentation, each member of the group should participate. This could mean each team member presenting back one of the above bullet points.

