PROBABILITY

SINGLE EVENTS

NO CALCULATOR

Ref: G510. 1R1

A1 Cameron throws a fair coin. He gets a Head. Cameron's sister then throws the same coin. What is the probability that she will get a Head?	**A2** Damien throws a coin 30 times. Explain why he may not get exactly 15 Heads and 15 Tails.	**A3** Lucas throws a bias coin 180 times. It lands on tails 120 times. Lucas throws the coin once more. Work out an estimate for the probability that it will show **heads**.	**A4** Serena throws a fair coin three times and gets two heads and a tail. Serena's then throws the same coin once more. What is the probability that the coin will land on heads?
B1 Every morning Joanne eats one of cereal, toast or croissants. P(cereal) = 0.45 P(croissants) = 0.3 Find P(toast)	**B2** Rosie throws a coin 1000 times. She gets heads 490 times. State, with a reason, whether the coin is fair.	**B3** In a class of 30 students, 6 of the students are left handed and 9 of the students wear glasses. Anthony says 'the probability that a student is left-handed or wears glasses is 0.5' State, with a reason, whether Anthony is right.	**B4** Millie takes a bead at random from a bag. The probability that she will take a red bead is 0.3 There are 120 beads in the bag. How many red beads are there in the bag?
C1 Felix throws a dice 600 times. He scores six 200 times. Is the dice fair? Explain your answer.	**C2** Amy spins a spinner once. P(she scores 4) = 0.3 If Amy were to spin the spinner 200 times, work out an estimate for the number of times that she would score 4	**C3** A bag contains some red beads, black beads and yellow beads. Sarah takes a bead at random from the bag. P(red) = 0.3 P(black) = P(yellow) Find P(yellow)	**C4** A bag contains 10 coloured counters. James is going to take at random, a counter from the bag. He states "The probability that I will take a red counter is 0.25". Explain why James is wrong.

PROBABILITY

SINGLE EVENTS

Probabilities are only estimates of how often outcomes will occur.

Probabilities are only reliable when there are a large number of 'trials'.

Ref: G510. 1R1

A1 Cameron throws a fair coin. He gets a Head. Cameron's sister then throws the same coin. What is the probability that she will get a Head? $\frac{1}{2}$	**A2** Damien throws a coin 30 times. Explain why he may not get exactly 15 Heads and 15 Tails. The result of a coin throw is random. You cannot predict exactly what will happen on any particular throw. You can only predict that the outcomes after many throws are approximately equal.	**A3** Lucas throws a bias coin 180 times. It lands on tails 120 times. Lucas throws the coin once more. Work out an estimate for the probability that it will show **heads**. $\frac{60}{180} = \frac{1}{3}$	**A4** Serena throws a fair coin three times and gets two heads and a tail. Serena's then throws the same coin once more. What is the probability that the coin will land on heads? The coin is 'fair' so probability of heads will always be $\frac{1}{2}$
B1 Every morning Joanne eats one of cereal, toast or croissants. P(cereal) = 0.45 P(croissants) = 0.3 Find P(toast) $= 1-(0.45+0.3)$ $= 0.25$	**B2** Rosie throws a coin 1000 times. She gets heads 490 times. State, with a reason, whether the coin is fair. $\frac{500-490}{1000} = 1\%$ 490 is only 1% away from the expected number of 500 heads so the coin is probably fair.	**B3** In a class of 30 students, 6 of the students are left handed and 9 of the students wear glasses. Anthony says 'the probability that a student is left-handed or wears glasses is 0.5' He is wrong because he has not taken account of the people who are both left-handed and wear glasses.	**B4** Millie takes a bead at random from a bag. The probability that she will take a red bead is 0.3 There are 120 beads in the bag. How many red beads are there in the bag? $0.3 \times 120 = 36$
C1 Felix throws a dice 600 times. He scores six 200 times. Is the dice fair? $\frac{200-100}{600} = 17\%$ 200 is 17% away from the expected number of 100 sixes. This is a lot so the dice is probably not fair.	**C2** Amy spins a spinner once. P(she scores 4) = 0.3 If Amy were to spin the spinner 200 times, work out an estimate for the number of times that she would score 4 $0.3 \times 200 = 60$	**C3** A bag contains some red beads, black beads and yellow beads. Sarah takes a bead at random from the bag. P(red) = 0.3 P(black) = P(yellow) $P(B)+P(Y)=0.7$ $P(Y)=P(B)=0.35$	**C4** A bag contains 10 coloured counters. James is going to take at random, a counter from the bag. He states "The probability that I will take a red counter is 0.25". Jame is wrong because with 10 counters, the only possible probabilities are 0.1, 0.2, 0.3, etc.