STATISTICS: EXPECTED OUTCOMES & BIASED EVENTS

Best Guess Mastery Worksheet (Target Grade 3/4)

I Do

Zoe has a biased 5-sided spinner, numbered 1, 2, 3, 4, 5.
The table gives the probabilities that when the spinner is spun it will land on 2 or on 3 or on 5.

Number	1	2	3	4	5
Probability		0.15	0.22		0.13

The probability that the spinner will land on 1 is the same as the probability that the spinner will land on 4.

Zoe is going to spin the spinner 300 times.

Work out an estimate for the number of times the spinner will land on 4.

We Do

Niall has a biased 5-sided spinner, numbered 1, 2, 3, 4, 5.
The table gives the probabilities that when the spinner is spun it will land on 1 or on 3 or on 5.

Number	1	2	3	4	5
Probability	0.18		0.24		0.12

The probability that the spinner will land on 2 is the same as the probability that the spinner will land on 4.

Niall is going to spin the spinner 500 times.

Work out an estimate for the number of times the spinner will land on 2.

STATISTICS: EXPECTED OUTCOMES & BIASED EVENTS

You Do 1

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Catherine has a biased 5-sided spinner, numbered 1, 2, 3, 4, 5.
The table gives the probabilities that when the spinner is spun it will land on 1 or on 3 or on 5.

Number	1	2	3	4	5
Probability	0.11		0.31		0.28

The probability that the spinner will land on 2 is the same as the probability that the spinner will land on 4.

Catherine is going to spin the spinner 200 times.

Work out an estimate for the number of times the spinner will land on 4.

You Do 2

Jo has a biased 5-sided spinner, numbered 1, 2, 3, 4, 5.
The table gives the probabilities that when the spinner is spun it will land on 2 or on 3 or on 4.

Number	1	2	3	4	5
Probability		0.35	0.05	0.10	

The probability that the spinner will land on 1 is the same as the probability that the spinner will land on 5.

Jo is going to spin the spinner 400 times.

Work out an estimate for the number of times the spinner will land on 1.

STATISTICS: EXPECTED OUTCOMES & BIASED EVENTS

Best Guess Mastery Worksheet (Target Grade 4/5)

Challenge 1

Mark has a biased 5-sided spinner, numbered 1, 2, 3, 4, 5.
The table gives the probabilities that when the spinner is spun it will land on 1 or on 2 or on 3.

Number	1	2	3	4	5
Probability	0.1	0.2	0.3		

The ratio of the probability of landing on 4 to the probability of landing on 5 is 1 : 3.

Mark is going to spin the spinner 600 times.

Work out an estimate for the number of times the spinner will land on 5.

Challenge 2

Keeley has a biased 4-sided spinner, labelled A, B, C, D.
The table shows the probabilities, given algebraically, for landing on each letter.

Letter	A	B	C	D
Probability	$2x$	$3x$	$4x$	x

Keeley is going to spin the spinner 800 times.

Work out an estimate for the number of times the spinner will land on a vowel (A).

Answers & Worked Solutions

I Do:

1. Total known probability: 0.15 + 0.22 + 0.13 = 0.50.
2. Remaining probability: 1 − 0.50 = 0.50.
3. Since P(1) = P(4), split it evenly: P(4) = 0.50 ÷ 2 = 0.25.
4. Calculate expected frequency: 0.25 × 300 = **75 times**.

We Do:

1. Total known probability: 0.18 + 0.24 + 0.12 = 0.54.
2. Remaining probability: 1 − 0.54 = 0.46.
3. Since P(2) = P(4), split it evenly: P(2) = 0.46 ÷ 2 = 0.23.
4. Calculate expected frequency: 0.23 × 500 = **115 times**.

You Do 1:

1. Total known probability: 0.11 + 0.31 + 0.28 = 0.70.
2. Remaining probability: 1 − 0.70 = 0.30.
3. Since P(2) = P(4), split it evenly: P(4) = 0.30 ÷ 2 = 0.15.
4. Calculate expected frequency: 0.15 × 200 = **30 times**.

You Do 2:

1. Total known probability: 0.35 + 0.05 + 0.10 = 0.50.
2. Remaining probability: 1 − 0.50 = 0.50.
3. Since P(1) = P(5), split it evenly: P(1) = 0.50 ÷ 2 = 0.25.
4. Calculate expected frequency: 0.25 × 400 = **100 times**.

Challenge 1:

1. Total known probability: 0.1 + 0.2 + 0.3 = 0.6.
2. Remaining probability: 1 − 0.6 = 0.4.
3. The ratio 1:3 has 4 total parts. 0.4 ÷ 4 = 0.1 per part.
4. P(5) gets 3 parts: 3 × 0.1 = 0.3.
5. Calculate expected frequency: 0.3 × 600 = **180 times**.

Challenge 2:

1. Set up equation (probabilities sum to 1): $2x + 3x + 4x + x = 1$.
2. Simplify: $10x = 1$. Therefore, $x = 0.1$.

3. Find P(A): $2 \times 0.1 = 0.2$.
4. Calculate expected frequency: $0.2 \times 800 =$ **160 times**.