Probabilities from experiments and statistical displays

Mana Maths

Te reo Māori terms

tūponotanga
probability
Open in Te Aka

whakamātau
experiment
Open in Te Aka

raraunga
data
Open in Te Aka

kauwhata
graph
Open in Te Aka

Foundation

1. A coin is tossed 20 times and lands heads 11 times. Estimate the probability of heads.

2. A die is rolled 30 times and a 6 appears 4 times. Estimate the probability of rolling a 6.

3. A spinner lands on red 9 times in 15 spins. Estimate the probability of red.

4. In 25 draws from a bag, a blue counter is picked 10 times. Estimate the probability of blue.

5. A survey chart shows 18 of 30 students walk to school. Estimate the probability that a randomly chosen student walks to school.

6. A weather record shows rain on 6 of the last 10 days. Estimate the probability of rain tomorrow using this data.

7. A coin lands tails 14 times in 20 tosses. Write the experimental probability of tails.

8. A spinner lands on green 7 times in 28 spins. Write the experimental probability of green.

9. Out of 40 penalty shots, 26 are scored. Estimate the probability of scoring.

10. Out of 50 seeds planted, 35 sprout. Estimate the probability that a seed sprouts.

11. Which is greater: an experimental probability of $\frac{9}{20}$ or $\frac{1}{2}$?

12. Which is smaller: 30% success or $\frac{2}{5}$ success?

13. Fill in the blank: 12 wins from 20 games gives an experimental probability of $\frac{\square}{20}$.

14. Fill in the blank: 15 successes from 25 trials gives an experimental probability of $\square\%$.

15. A student says 3 reds in 12 draws means the probability of red is $\frac{1}{3}$. Are they correct?

16. Explain in one short sentence what experimental probability means.

Proficient

1. A coin is tossed 80 times and lands heads 37 times. Estimate the probability of heads as a fraction and decimal.

2. A die is rolled 60 times and an even number appears 34 times. Estimate the probability of rolling an even number.

3. A spinner lands on blue 18 times in 45 spins. Estimate the probability of blue.

4. A bus is late on 9 of the last 24 school days. Estimate the probability it is late on a future school day.

5. In a tally chart, 14 of 35 customers choose mango. Estimate the probability that the next customer chooses mango.

6. A class bar chart shows 12 students play football, 9 netball, 6 basketball, and 3 hockey. Estimate the probability a randomly chosen student plays netball.

7. A bag is sampled 50 times with replacement and a yellow counter appears 21 times. Estimate the probability of yellow.

8. In 120 free throws, a player scores 78. Estimate the probability of scoring a free throw.

9. Which is closer to $\frac{1}{2}$: 24 successes in 50 trials or 17 successes in 30 trials?

10. Fill in the blank: 48 correct answers from 60 questions gives an experimental probability of $\square\%$.

Excellence

1. A student says 41 heads in 80 tosses proves a coin is unfair. Are they correct? Explain.

2. A spinner has four equal sectors, so the theoretical probability of red is $\frac{1}{4}$. In 12 spins red appears 6 times. Compare the experimental and theoretical probabilities.

3. A bar chart shows bus arrivals over 50 days: early 8, on time 29, late 13. Estimate the probability that tomorrow's bus is late.

4. A survey of 120 students shows 54 bring lunch, 42 buy lunch, and 24 go home. Estimate the probability a randomly chosen student buys lunch.

5. A basketball player scores 63 shots from 90 attempts. Estimate the probability of scoring, as a fraction in simplest form and as a percentage.

6. In a science test, 18 of 30 seedlings survive in one tray and 52 of 80 survive in another. Which tray has the higher survival probability

7. A machine makes faulty items with theoretical probability 0.08. In a sample of 150 items, 18 are faulty. Is the experimental probability above or below the theoretical probability?

8. A coin is tossed 200 times and lands heads 94 times. Is this result closer to 0.45, 0.47, or 0.50? Explain.

9. Which is greater: 17 wins from 40 games or 31 wins from 70 games? Show enough working to justify.

10. A hospital record shows 126 of 300 patients waited under 15 minutes. Estimate the probability that the next patient waits under 15 minutes.