Year 7 · Probability: Testing Your Luck with Experiments

Name: _____ Date: _____

Hi! This sheet is all about experimental probability, what actually happens when you run a chance experiment, and how it compares to what we expect. Grab a coin, a die, and something to record your results, and let's find out!

Warm-up

1. Aroha tossed a coin 40 times and got 22 heads. Write the experimental probability of getting heads as a fraction.

2. Write 11/20 as a decimal.

3. A spinner has 4 equal-sized colours: red, blue, green and yellow. What is the theoretical probability of landing on blue?

4. In 50 rolls of a die, the number 6 came up 9 times. What is the experimental probability of rolling a 6?

Practice

5. Tama rolled an ordinary six-sided die 30 times and recorded these results: 1 appeared 4 times, 2 appeared 6 times, 3 appeared 5 times, 4 appeared 3 times, 5 appeared 7 times, 6 appeared 5 times. Calculate the experimental probability of rolling a 5.

6. For the same 30 rolls above, what is the theoretical probability of rolling a 5, and how does it compare to the experimental result?

7. Explain what would likely happen to the experimental probability of rolling a 5 if Tama rolled the die 600 times instead of 30.

8. Mereana runs a chance experiment by tossing a coin 100 times. She gets 46 heads and 54 tails. Find the experimental probability of heads and of tails, then compare each to its theoretical probability.

9. At the Avondale Primary gala, a game uses a bag with 3 red counters and 2 blue counters. Ravi draws a counter, records the colour, and puts it back, doing this 40 times. He records 26 reds and 14 blues. What is the experimental probability of red, and what is the theoretical probability of red?

10. Sione suspects a die is weighted. He rolls it 120 times and the number 3 comes up 40 times. What is the experimental probability of rolling a 3, and does this support his suspicion? Explain.

Challenge

11. Two students test the same spinner with 3 equal sections (A, B, C). Ana does 30 spins and gets A: 14, B: 9, C: 7. Ben does 300 spins and gets A: 104, B: 98, C: 98. The theoretical probability of each section is 1/3 ≈ 0.33. Whose results are closer to the theoretical probability, and what does this show?

12. A game charges $2 to spin a wheel with 10 equal sections: 9 sections say 'Lose' and 1 says 'Win $15'. In 200 spins, the wheel landed on 'Win' 18 times. (a) Find the experimental probability of winning. (b) Compare it to the theoretical probability. (c) Over these 200 spins, did the game organiser make or lose money?