Build Tasks

Explain why the "equal outcomes" assumption matters when using the probability formula.

1. Why is $P(\text{head}) = \frac{1}{2}$ only valid if the coin is assumed fair?

2. A die has faces 1 to 6, but one side is heavier. Can we still use $\frac{1}{6}$ for each face? Explain.

3. A bag has 4 red and 6 blue counters. What assumption lets us say $P(\text{red}) = \frac{4}{10}$?

4. When is it reasonable to treat outcomes as equally likely?

Build Tasks

Distinguish between what is possible and what is likely. Use sample size to judge evidence of bias.

5. A student gets 8 sixes in 20 rolls. Does that prove the die is biased? Why or why not?

6. Why does replacement matter when assuming the same probability on every draw?

7. Would 51 heads in 100 flips be strong evidence of bias? Explain briefly.

8. Why should large samples usually match theoretical probability more closely than small samples?

Build Tasks

Identify hidden assumptions in probability statements and apply them to new situations.

9. If outcomes are not equally likely, what extra information do you need before finding a probability?

10. A game advertises a 1 in 4 chance of winning. What must be true for that claim to make sense?

11. Give a reason why a coin might behave unfairly in real life.

12. Describe one simple test you could do to check whether a spinner seems biased.