

Probability: Experimental vs. Theoretical

Name: _____ Date: _____

LEARNING OBJECTIVE

The student will run a hands-on probability experiment and compare experimental results to theoretical probability.

MATERIALS NEEDED

- a coin
- a six-sided die (or number cube made from paper)
- paper
- pencil
- calculator

HANDS-ON ACTIVITY

1. Calculate the theoretical probability of flipping heads on a coin and of rolling a 4 on a die; write both as fractions and percentages.
2. Flip a coin 30 times, tallying heads and tails in a table as you go.
3. Roll a die 30 times, tallying how often each number 1-6 appears in a table.
4. Calculate your experimental probability of heads and of rolling a 4 from your tally data, writing each as a fraction and percentage.
5. Create a simple bar graph comparing your experimental die results (6 bars) to the theoretical expected frequency (5 out of 30 for each number).

QUESTIONS

1. What is the theoretical probability of flipping heads, and what was your experimental probability after 30 flips?
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2. What is the theoretical probability of rolling a 4, and what was your experimental probability after 30 rolls?
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3. Why might your experimental probability differ from the theoretical probability?
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4. If you rolled the die 3,000 times instead of 30, would you expect your experimental probability to get closer to or farther from the theoretical value? Explain.
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