Grade 7 and 8 Probability Review Worksheet

Name: _____ Date: _____

Grade 7 and 8 Math Curriculum Expectations

- **Grade 7:** Solve problems that involve determining the theoretical probability of independent events and the experimental probability of an event using a large number of trials.
- **Grade 8:** Use a variety of tools and strategies to estimate and calculate the probability of events, including compound events.

Part A: Theoretical Probability

1. Basic Probability

a) What is the probability of rolling a 3 on a standard six-sided die?

b) What is the probability of drawing a red card from a standard deck of 52 cards?

c) A box contains 3 red marbles, 5 blue marbles, and 2 green marbles. What is the probability of drawing a blue marble?

2. Independent Events

a) What is the probability of flipping a coin and getting heads, and then rolling a six-sided die and getting a 4?

b) In a bag, there are 4 red balls and 6 blue balls. If you draw one ball, replace it, and then draw another ball, what is the probability that both balls will be red?

Part B: Experimental Probability

3. Conducting Experiments

a) Flip a coin 50 times and record the number of heads and tails. Calculate the experimental probability of getting heads.

b) Roll a six-sided die 100 times and record the outcomes. Calculate the experimental probability of rolling a 5.

4. Comparing Theoretical and Experimental Probability

a) Compare the theoretical probability of getting heads on a coin flip to your experimental results from 3a. Explain any differences.

b) Compare the theoretical probability of rolling a 5 on a six-sided die to your experimental results from 3b. Explain any differences.

Part C: Compound Events

5. Combined Probabilities

a) A spinner is divided into 4 equal sections labeled A, B, C, and D. What is the probability of spinning an A and then a B on two consecutive spins?

b) Two six-sided dice are rolled. What is the probability of getting a sum of 7?

6. Using Trees and Tables

a) Create a tree diagram to represent the possible outcomes of flipping a coin twice. What is the probability of getting two heads?

b) Use a table to list all possible outcomes when rolling two six-sided dice. What is the probability of rolling a double (same number on both dice)?

Part D: Reflection

7. Thinking Critically

a) How does increasing the number of trials in an experiment affect the experimental probability?

b) Why is it important to understand both theoretical and experimental probabilities? Provide an example from real life where both are useful.

Answers Key:

Part A: Theoretical Probability

1a) $\frac{1}{6}$
1b) $\frac{26}{52} = \frac{1}{2}$
1c) $\frac{5}{10} = \frac{1}{2}$

2a) $\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$
2b) $\frac{4}{10} \times \frac{4}{10} = \frac{16}{100} = \frac{4}{25}$

Part B: Experimental Probability

3a) Example: 24 heads, 26 tails → $P(\text{heads}) = \frac{24}{50} = 0.48$
3b) Example: 18 times rolling a 5 → $P(5) = \frac{18}{100} = 0.18$

4a) Theoretical $P(\text{heads}) = 0.5$; Experimental $P(\text{heads}) = 0.48$. Differences due to sample size and randomness.
4b) Theoretical $P(5) = \frac{1}{6} \approx 0.167$; Experimental $P(5) = 0.18$. Differences due to sample size and randomness.

Part C: Compound Events

5a) $\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$
5b) $\frac{6}{36} = \frac{1}{6}$

6a) Tree diagram: HH, HT, TH, TT → $P(\text{HH}) = \frac{1}{4}$
6b) Table: 6 outcomes for doubles → $P(\text{double}) = \frac{6}{36} = \frac{1}{6}$

Part D: Reflection

7a) Increasing trials usually makes experimental probability closer to theoretical probability.
7b) Understanding both helps in predicting a[↓]nalyzing outcomes. Example: Weather forecasting uses theoretical models and experimental data to predict weather.