12.1 Probability Mastery Practice NAME _____ DATE _____ PERIOD _____

The **probability** of a simple event is a ratio that compares the number of favorable outcomes to the number of possible outcomes. Two events that are the only ones that can possibly happen are **complementary events**. The sum of the probabilities of complementary events is always 1.

Example 1 **What is the probability of rolling a multiple of 3 on a number cube marked with 1, 2, 3, 4, 5, and 6 on its faces?**

$$P(\text{multiple of 3}) = \frac{\text{multiples of 3 possible}}{\text{total numbers possible}}$$

$= \frac{2}{6}$ Two numbers are multiples of 3: 3 and 6.

$= \frac{1}{3}$ Simplify.

The probability of rolling a multiple of 3 is $\frac{1}{3}$ or about 33.3%.

Example 2 **What is the probability of *not* rolling a multiple of 3 on a number cube marked with 1, 2, 3, 4, 5, and 6 on its faces?**

$P(A) + P(\text{not } A) = 1$ Substitute $\frac{1}{3}$ for $P(A)$.

$\frac{1}{3} + P(\text{not } A) = 1$ Subtract $\frac{1}{3}$ from each side.

$-\frac{1}{3} \quad -\frac{1}{3}$

$P(\text{not } A) = \frac{2}{3}$ Simplify. The probability of *not* rolling a multiple of 3 is $\frac{2}{3}$ or about 66.7%.

A set of 30 cards is numbered 1, 2, 3, ..., 30. Suppose you pick a card at random without looking. Find the probability of each event. Write as a fraction in simplest form, then as a decimal, then as a percent.
SHOW YOUR SETUP!!!

1. $P(12)$	**2.** P(2 or 3)	**3.** P(odd number)
4. P(a multiple of 5)	**5.** P(*not* a multiple of 5)	**6.** P(less than or equal to 10)

A set of 12 cards is numbered 1, 2, 3, ..., 12. Suppose you pick a card at random without looking. Find the probability of each event. Write as a fraction in simplest form, then as a decimal, then as a percent.
SHOW YOUR SETUP!!!

7. P(5)	**8.** P(6 or 8)	**9.** P(a multiple of 3)
10. P(an even number)	**11.** P(a multiple of 4)	**12.** P(less than or equal to 8)
13. P(a factor of 12)	**14.** P(*not* a multiple of 4)	**15.** P(1, 3, or 11)

The students at Job's high school were surveyed to determine their favorite foods. The results are shown in the table below. Suppose students were randomly selected and asked what their favorite food is. Find the probability of each event. Write as a fraction in simplest form.

Favorite Food	Responses
Pizza	19
Steak	8
Chow-mein	5
Seafood	4
Spaghetti	3
Cereal	1

16. P(steak)

17. P(Spaghetti)

18. P(cereal or seafood)

19. P(*not* chow-mein)

19. P(pizza)

20. P(cereal or steak)

21. P(*not* steak)

22. P(*not* cereal or seafood)

23. P(chicken)

24. P(chow mein or spaghetti)

Kyra opened her piggy bank and counted the number of each coin. The table below shows the results. For Exercises 25-27, assume that the coins are put in a bag and one is chosen at random.

Coin	Number
Quarters	15
Dimes	21
Nickels	22
Pennies	32

25. What is the probability that a quarter is chosen?

26. What is the probability that a nickel or a dime is chosen?

27. What is the probability that the chosen coin is worth more than 5 cents?

Read carefully.

28. Kaden has two number cubes, each with faces numbered 1, 2, ..., 6. What is the probability that he can role the cubes so that he rolls a 1 and then a 5?

29. Colten bought a new skateboard for which the probability of having a defective wheel is 0.015. What is the probability of *not* having a defective wheel?

30. Jordan's teacher had 6 calculators for 28 students to use. If the first students to use the calculators are chosen at random, what is the probability that Jordan will get one?

31. The rental car company had 14 sedans and 8 minivans available to rent. If the next customer picks a vehicle at random, what is the probability that a minivan is chosen?

32. Tyler has 16 pop CDs, 6 classical, and 2 rock. Tyler chooses a CD at random. What is the probability he does *not* choose a classical CD?