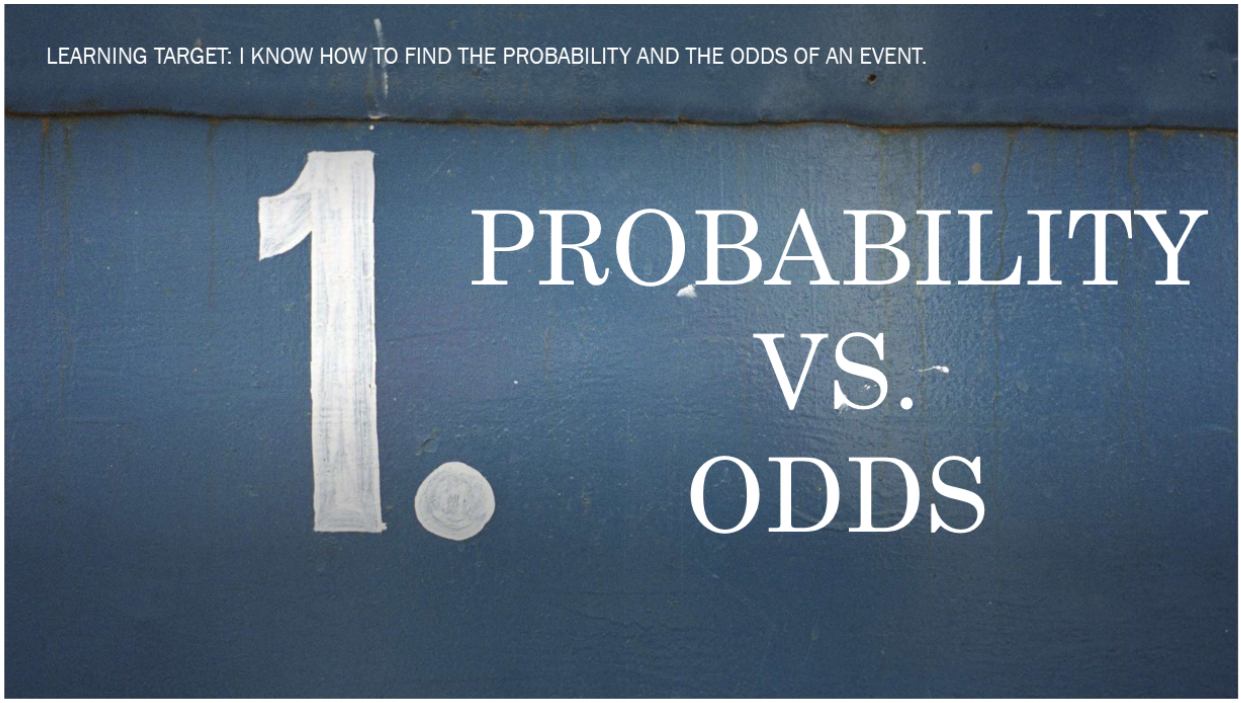

LEARNING TARGET: I KNOW HOW TO FIND THE PROBABILITY AND THE ODDS OF AN EVENT.
1.
PROBABILITY
VS.
ODDS

Probability of Success and Failure:

AN EVENT CAN SUCCEED IN S WAYS AND FAIL IN F WAYS-
(THIS IS CALLED IS THE SAMPLE SPACE)

THE PROBABILITY OF SUCCESS

THE PROBABILITY OF FAILURE

- S+F = THE TOTAL NUMBER OF POSSIBLE OUTCOMES
- $P(S) = \frac{s}{s+f}$
- $P(F) = \frac{f}{s+f}$.

Must familiar with

EXAMPLE 1

Ex 1: You roll a six-sided die. What is the probability that you will roll:

1, 2, 3, 4, 5, 6

a. a 5 $1/6$

b. an even number $3/6 = 1/2$

c. a number greater than 4 $2/6 = 1/3$

Steps to find Probability:
1) define success – determine the number of ways to have success
2) determine the total number of possible outcomes
3) write a ratio of desired / total possible outcomes, in fraction form
4) simplify your result, or write in decimal or percent form, as appropriate for the problem

Ex 2:

You are choosing socks from a drawer in the dark. The drawer contains 5 white socks, 4 black socks and 6 grey socks.

Determine each probability.

a. P(grey)

b. P(white)

c. P(not black)

ODDS New!!!

ODDS OF SUCCESS = S:F ODDS OF FAILURE = F:S

The difference between odds and probability reminds me of the partitioning formula.

ratio of success to failure

or

failure to success

total outcomes

s + f = everything

6 total outcomes

Success : Failure

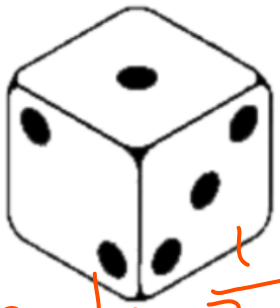
1, 2, 3, 4, 5, 6

EX 3: YOU ROLL A SIX-SIDED DIE. WHAT ARE THE ODDS OF ROLLING:

a) A 5 — 1:5 odds

b) AN ODD NUMBER — 3:3 → 1:1

c) A NUMBER DIVISIBLE BY 3



Prob. $\frac{1}{2}$

1, 2, 3, 4, 5, 6

2 : 4

↳ 1 : 2

Ex 2:

You are choosing socks from a drawer in the dark. The drawer contains 5 white socks, 4 black socks and 6 grey socks.

What are the odds that you choose:

A. A BLACK SOCK 4 : 11

B. A SOCK THAT IS NOT BLACK 11 : 4

C. A WHITE SOCK 5 : 10

1 : 2

EX 5: IF THE ODDS OF AN EVENT ARE 5:8, WHAT IS THE PROBABILITY OF THE EVENT OCCURRING?

$$\frac{S}{S+F} = \frac{5}{5+8} = \frac{5}{13}$$

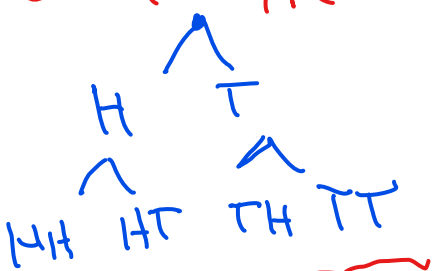
Ex 6: You flip two coins. Write out the **sample space** – the set of all possible outcomes.

all outcomes

SAMPLE SPACE IS THE TOTAL NUMBER OF POSSIBLE OUTCOMES.

Coin 1 \ Coin 2	H	T
H	HH	HT
T	TH	TT

or use tree



{HH, HT, TH, TT}

4 outcomes

Guided notes and Practice work. Day 1 Unit 6

Probability and Odds

Probability of Success and Failure: If an event can succeed in s ways and fail in f ways, then
s+f = *(the total number of possible outcomes)*
The probability of success $P(S) = \frac{s}{s+f}$ and the probability of failure $P(F) = \frac{f}{s+f}$.

Ex 1: You roll a six-sided die. What is the probability that you will roll:

a. a 5

b. an even number

c. a number greater than 4

1) define success – determine the number of ways to have success
2) determine the total number of possible outcomes
3) write a ratio of desired / total possible outcomes, in fraction form
4) simplify your result, or write in decimal or percent form, as appropriate for the problem

Ex 2: You are choosing socks from a drawer in the dark. The drawer contains 5 white socks, 4 black socks and 6 grey socks. Determine each probability.

a. P(grey) b. P(white) c. P(not black)

Odds of success = s:f Odds of failure = f:s

Ex 3: You roll a six-sided die. What are the odds of rolling:

a. a 5 b. an odd number c. a number divisible by 3

Ex 4: Choosing a sock from the drawer in example 2, what are the odds that you choose:

a. a black sock b. a sock that is not black c. a white sock

Ex 5: If the odds of an event are 5:8, what is the probability of the event occurring?

Ex 6: You flip two coins. Write out the **sample space** – the set of all possible outcomes.

Guided notes and Practice work. Day 1 Unit 6

Probability and Odds Practice:

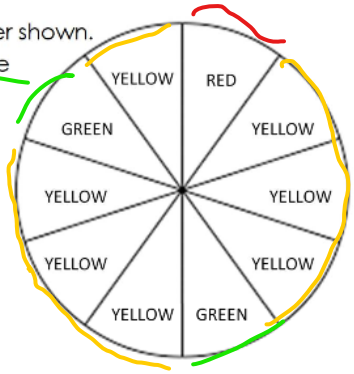
1. If the probability of rain tomorrow is 0.20, then what are the odds that it will **not** rain?

2. If one card is drawn from a standard deck, find the probability of getting these results.

a. An ace
b. A diamond
c. An ace of diamonds
d. A 4 or a 6
e. A 6 or a club
f. A heart or a club
g. A red card
h. A red queen

3. What are the odds of drawing a red queen?

4. At a special mall promotion, shoppers may spin the spinner shown. If they spin red, the customer wins $50. If they spin green, the customer wins $10. If they spin yellow, they win a coupon. Find the following probabilities.



a. a customer wins $10

b. a customer wins money

c. a customer wins a coupon

5. Choose one of the 50 states at random. What is the probability that it begins with A?

6. Choose a number between 1 and 10 at random. What are the odds that it will be divisible by 4?

7. In your class, 52% are female. Choose a student in class at random. What is the probability that the student is male?

8. You flip two coins. What is the probability that the result is...
a. 2 heads b. 1 heads and 1 tails c. 2 tails

Guided notes and Practice work. Day 1 Unit 6

Find the **Sample Space** (total number of possible outcomes) for each of the following situations. You are not determining probability or odds, just number of total possibilities.

1) A bag contains two red marbles and three blue marbles. You randomly pick a marble.

A) 10 B) 4 C) 5 D) 9

2) When a button is pressed, a computer program outputs a random odd number greater than 1 and less than 11. You press the button once.

A) 4 B) 8 C) 5 D) 1

3) A math quiz has five multiple choice questions. Each question has four options: A, B, C, and D.

4) You flip a coin nine times.

5) When a button is pressed, a computer program outputs a random even number greater than 0 and less than 8. You press the button six times.

6) A spinner can land on either red, blue, or green. You spin twice.

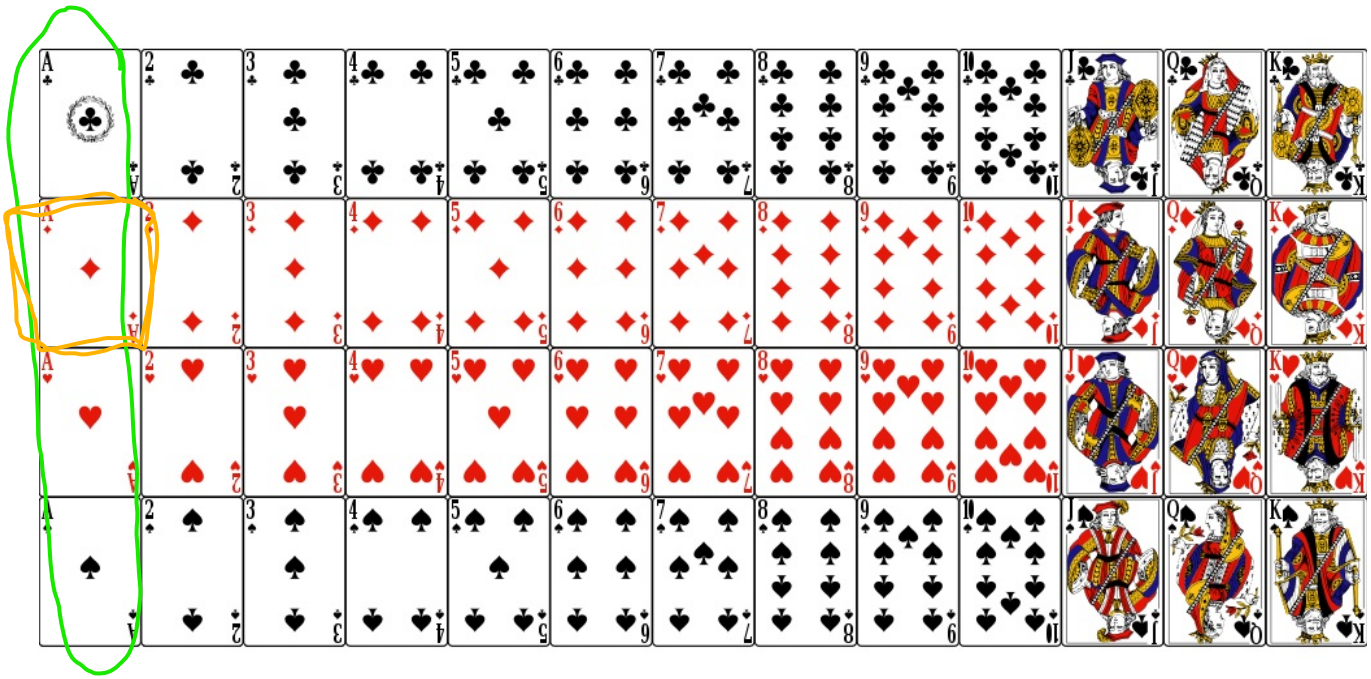
7) An ice cream stand offers single-scoop waffle-cones or bowls. Three flavors are available: strawberry, chocolate, and vanilla.

8) A spinner can land on either red, blue, green, yellow, purple, or orange. You flip a coin and then spin the spinner.

9) You flip a coin and then roll a six-sided die.

10) There is one quarter, one dime, and one nickel in your pocket. You randomly pick a coin from your pocket and place it on the counter. Then you pick a second coin from your pocket.

Ace



52 total cards

4 : 4

OR

6 : 4

8