

Compound Events

Learning Targets

- Finding a Sample Space
- Using the Counting Principle
- Finding Total # of Possible Outcome
- Finding the Probability of a Compound Event

Sample Space:

The set of all possible outcomes of one or more events.

You can use organized lists, tables and tree diagrams to find the sample space of two or more events.

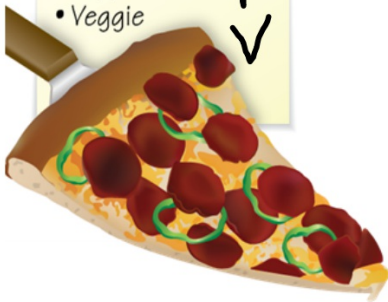
Finding a Sample Space: Tree Diagram

Crust

- 2
- Thin Crust Th
 - Stuffed Crust S

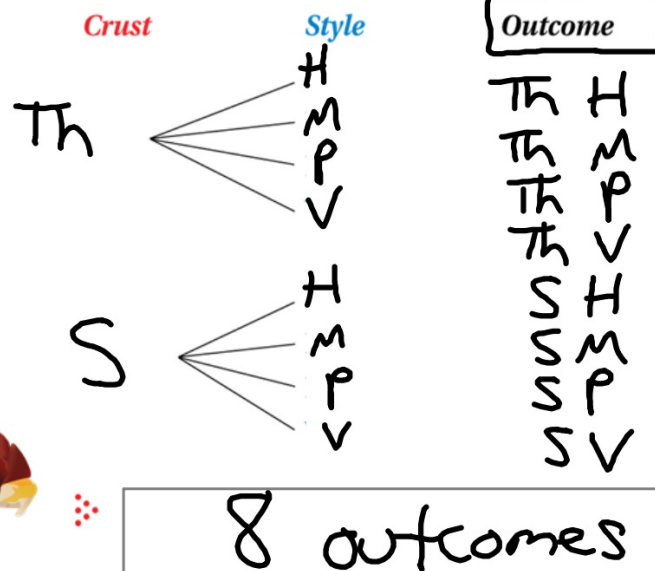
Style

- 4
- Hawaiian H
 - Mexican M
 - Pepperoni P
 - Veggie V



You randomly choose a crust and style of pizza. Find the sample space.
How many different pizzas are possible?

Use a tree diagram to find the sample space.



Finding the Total Number of Possible Outcomes Using a Table



Find the total number of possible outcomes of rolling a number cube and flipping a coin.

Method 1: Use a table to find the sample space. Let H = heads and T = tails.



	1	2	3	4	5	6
H	1H	2H	3H	4H	5H	6H
T	1T	2T	3T	4T	5T	6T



There are possible outcomes.

$$6 * 2 = 12 \text{ outcomes}$$

Fundamental Counting Principle:

An event M has m possible outcomes.

An event Q has q possible outcomes.

The total number of outcomes of an event M followed by an event Q is

$$m \cdot q$$

Finding the Total # of Possible Outcomes

$$4 * 7 * 3$$



How many different outfits can you make from the T-shirts, jeans, and shoes in the closet?

Use the Fundamental Counting Principle. Identify the number of possible outcomes for each event.

Event 1: Choosing a T-shirt has possible outcomes.

Event 2: Choosing jeans has possible outcomes.

Event 3: Choosing shoes has possible outcomes.

So, you can make different outfits.

84

Finding the Probability of a Compound Event

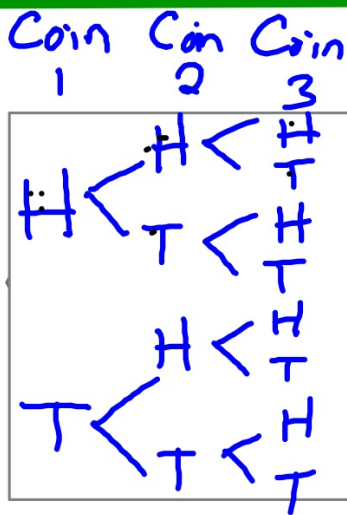
	1	2	3	4	5	6
1H	1H	2H	3H	4H	5H	6H
1T	1T	2T	3T	4T	5T	6T

In Example 2, what is the probability of rolling a number greater than 4 and flipping tails?

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$\begin{aligned} P(\text{greater than 4 and tails}) &= \frac{2}{12} = \frac{1}{6} \approx 17\% \\ &= \end{aligned}$$

Finding the Probability of a Compound Event



You flip three nickels. What is the probability of flipping two heads and one tails?

Use a tree diagram to find the sample space. Let H = heads and T = tails.

HHH	THH	$\frac{3}{8}$	37.5%
HHT	THT		
HTH	TTH		
HTT	TTT		

How many options per combination?



10
10
10

0-9

$$10 \times 10 \times 10$$

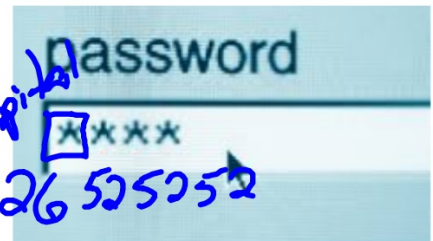
1000



3 spins
0-49

$$50 \times 50 \times 50$$

125,000



26 * 52 * 52 * 52

4 Letters, one must be a capital

$$26 \times 52 \times 52 \times 52$$

3,655,808

What is the probability someone could guess this password on their first try?

To: Leslie Kohrman;

Action Items

+ Get more apps

Dear Big Ideas Math Educator,

██████████ has requested to reset his or her password. Please provide ██████████ with this new password in class or forward this email. The new password is G5TPMD35DEHJ.

Sincerely, Big Ideas Learning

~~G5TPMD35DEHJ~~

$$26 \cdot 10 \cdot 26 \cdot 26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 26$$
$$\cdot 26 \cdot 26 \cdot 26 \cdot 26$$

$$1 \times 10^{17}$$

100,000,000,000,000,000

Homework
pg 425
#3-13 odd
15-27