



7th  
Basic

8th  
Advanced

# Helping With Math

USA  
GRADES

## Probability of Simple Events

*Suitable for students  
aged 11-13*



This pack is suitable for learners aged 11-13 years old or 7th to 8th graders (USA). The content covers fact files and relevant basic and advanced activities involving probability of simple events.

### Probability

Probability is a branch of mathematics that deals with the likelihood of an event to happen. The probability of an event is represented by a number assigned to a specific event..



### Probability

- 0 - the event will never happen
- 1 - the event is certain to happen
- Closer to 1 - the event is more likely to happen
- Closer to 0 - the event is less likely to happen
- 0.5 - the event is equally likely to happen



# PROBABILITY

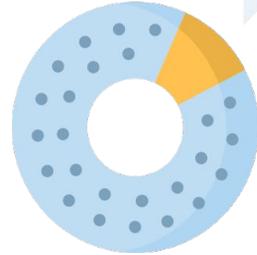
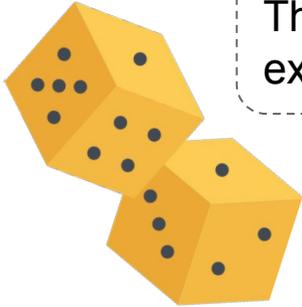
## Experiment

An activity or procedure under consideration.



## Trial

The repetition of an experiment is called a trial.



## Outcomes

The results obtained by the experiment.

### Example:

- Tossing the dice is the experiment.
- Each toss of the dice is called the trial.
- The numbers that will face up on the dice are the outcomes.



## Sample Space

The set of all possible outcomes is called the sample space.



## Simple Outcome

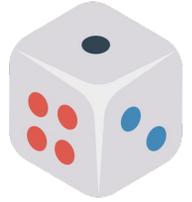
Also called a sample point, it refers to each element in the sample space.



# PROBABILITY

Find the sample space of each experiment.

1. Tossing a coin {Head, tails}
2. Rolling a fair die {1, 2, 3, 4, 5, 6}



## Event

This refers to a subset of a sample space.

In the experiment of drawing a number from 1 to 10, the sample space is:

{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}



What is the event that the number drawn is:

1. an even number?  
{2, 4, 6, 8, 10}
2. a prime number?  
{2, 3, 5, 7}

The probability of an event can be expressed as:

$$\text{Pr}(E) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

Ex.: What is the probability of getting an even number when throwing a fair die?

- Since we have 3 even numbers on a die out of the 6 possible outcomes, we have

$$\text{Pr}(E) = \frac{3}{6} = \frac{1}{2}$$

Note: The sum of probabilities of all simple outcomes in a sample space is 1.



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# FOUNDATION DAY

G7  
Basic

It's school's founding anniversary! To be able to join the the school fair, teachers assigned a task to students. Identify which of the statements are correct by writing true and replacing the underlined word/s if false.

1. An outcome is a result of a probability experiment.

2. An event is the set of all possible outcomes.

3. Trial is a process or procedure under observation.

4. Probability deals with the likelihood of an event to happen.

5. The probability of an event is represented by a numerical value.

6. A probability of zero means that an event is certain to happen.



# CERTAIN UNCERTAINTIES

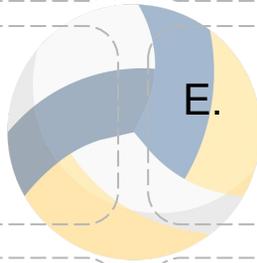
G7  
Basic

For some events in our daily life, we are very certain about the results or outcomes. However, there are other events we are not so certain. Ashley and her friends are watching the volleyball game. Study whether the event is certain or uncertain by writing the letter in its corresponding box below.

A. Team A will be the champion.

D. A team should get 3 sets out of 5 to win.

B. Volleyball players will be injured during the game.



E. You will lose your watch inside the gym while.

C. 7 players cannot play a volleyball game in a set.

F. The referee will call for a time out.

Certain



Uncertain



# A FAIR DIE

G7  
Basic

Peter has started walking around the school fair. He saw a game he will bet on the number that will show up on a die. Help Peter find the probability of his winning.

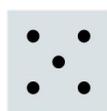
1. How many possible outcomes are there if two dice are thrown simultaneously?

A. 12

B. 18

C. 36

D. 72



2. A fair die is rolled. What is the probability of getting a multiple of two?

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

C.  $\frac{2}{3}$

B.  $\frac{1}{6}$

D.  $\frac{1}{3}$



3. A fair die is rolled. What is the probability of getting a number 7?

A.  $\frac{7}{6}$

B. 1

C.  $\frac{1}{6}$

D. 0

4. Two fair dice are rolled. Find the probability of getting a sum of 13.

A. 0

B.  $\frac{1}{36}$

B. 1

D.  $\frac{1}{6}$

5. Two fair dice are rolled. Find the probability of getting an even number sum.

A. 1

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

C.  $\frac{1}{4}$

D.  $\frac{1}{6}$

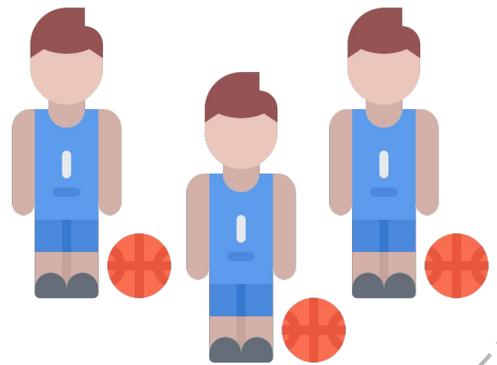


# SCHOOL FAIR'S BASKETBALL

G7  
Basic

As part of the school fair, teachers conducted a 3-on-3 basketball game. Peter and his classmates watch the game and predict who will win the game.

Have you tried predicting something in your life? If yes, share it and differentiate the experiment and the outcome of such activity in your life.



Give other examples where the concept of probability is evident.



# BALLOON BASH

G7  
Basic

One of the games in the school fair is the balloon bash. You will pop balloons in order to win. Ashley joined the game, find the probability of the following conditions in order for Ashley to win.

There are 8 orange balloons, 12 red balloons, and 16 blue balloons. If Ashley should pop 5 balloons of any color in 5 attempts, find the probability of the following:



1. Popping an orange balloon

2. Popping a red balloon

3. Popping a blue balloon

4. If she popped a red balloon on her 1st attempt, what is the probability of popping another red balloon on her 2nd attempt?

5. If she already popped 4 orange balloons on her first 4 attempts, what is the probability of popping a blue balloon on his 5th attempt?



# THE CAFETERIA GIRL

G8  
Basic

Ashley and friends move to the canteen to find something to eat. In one corner of the canteen, there is a girl who initiates a game. She wears an apron with some pockets on it and numbers 1 - 20 inside. Find the probability of the following.

The girl conducts 5 rounds of game. If there are numbers 1 to 20 in her pocket, find the probability of winning in each round.



1. Getting an even number

2. Getting an odd number

3. Getting a prime number

4. Getting a composite number

5. Getting a multiple of 5

2 5 3 1 2 5 3 1



# WATER COIN DROP

G8  
Basic

On a game called the water coin drop, the player will drop a coin in an aquarium with a glass filled with water. The coin should land inside the glass to win. While Ashley is watching, she thought of the following questions:

What happens to the probability of getting “Tails” if the coin is biased?



What are the least and the greatest values of the probability?



# COOKING CONTEST

G8  
Basic

At the school fair, canteen personnel organized a cooking contest with only 2 participants. In order to win, they should meet the criteria for judging. With this, they have equal chances of winning. Can you think of other events or situations for each probability below?

## Certain Events

1.

2.



## Even Chance of Events

1.

2.



## Impossible Events

1.

2.



# PLAYING CARDS

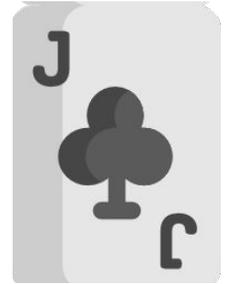
G8  
Basic

Andrew, Ashley's classmate, asked his friends to watch him play a solitaire game at the school fair. A standard deck of playing cards will be used. If Andrew will draw the first card, find the probability of the following events.

1. drawing an ace of diamonds



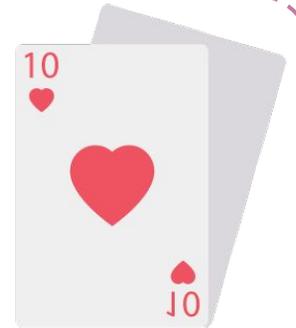
4. drawing a jack



2. drawing a red card



5. drawing a heart



3. drawing a face card



6. drawing a card with numbers 6 - 9



# THE COMMANDER

G8  
Basic

The school fair is about to end. Students are enjoying an arcade-like game named "The Commander". They need to shoot the marbles from numbers 1-15. If Andrew played this game, find the probability of the following events.



1. Getting an odd or prime number

2. Getting even or a two-digit number



2. Getting even or an odd number

4. How do you get the probability of compound events?



# ANSWER GUIDE

## Activity 1

- 1.) True                      3.) Experiment                      5.) True  
2.) sample space          4.) True                                  6.) 1

## Activity 2

Certain                      C, D  
Uncertain                      A, B, E, F

## Activity 3

- 1.) C            2.) A            3.) D            4.) A            5.) B

## Activity 4

Answers may vary.

## Activity 5

- 1.)  $\frac{2}{9}$           2.)  $\frac{1}{3}$           3.)  $\frac{4}{9}$           4.)  $\frac{11}{35}$           5.)  $\frac{1}{2}$

## Activity 6

- 1.)  $\frac{1}{2}$           2.)  $\frac{1}{2}$           3.)  $\frac{2}{5}$           4.)  $\frac{3}{5}$           5.)  $\frac{1}{5}$



# ANSWER GUIDE

## Activity 7

Answers may vary.

## Activity 8

Answers may vary.

## Activity 9

1.)  $\frac{1}{52}$     2.)  $\frac{1}{2}$     3.)  $\frac{3}{13}$     4.)  $\frac{1}{13}$     5.)  $\frac{1}{4}$     5.)  $\frac{4}{13}$

## Activity 10

1.)  $\frac{14}{15}$     2.)  $\frac{3}{5}$     3.) 1    4.) Answers may vary.



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