Test Thursday

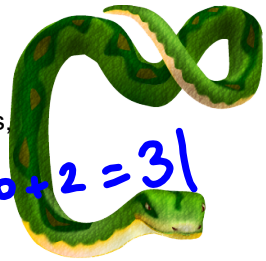
March 12

Warm Up

Date: Mar. 9

Ch. 7 Lesson 7

day 1

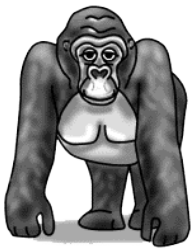


Oliver when to the zoo on the weekend. After reading the brochure he learned the zoo had: 5 lions, 3 snakes, 6 hippos, 2 killer whales, 3 gorillas, 10 penguins and 2 tigers.

Total animals = 5+3+6+2+3+10+2 = 31

1. What are the possible outcomes?

lions, snakes, hippos, whales, gorillas, penguins, tigers



2. What is the theoretical probability that he will see

a. gorillas

b. large cats

c. hippos and whales

a) $P(\text{gorilla}) = \frac{\#\text{ of gorillas}}{\text{Total Animals}} = \frac{3}{31}$

b) $P(\text{large cats}) = \frac{\#\text{ of lions and tigers}}{\text{Total Animals}} = \frac{7}{31}$

c) $P(\text{hippos \& whales}) = \frac{\#\text{ hippo and whales}}{\text{Total}} = \frac{5}{31}$

Practice

1. A paper bag contains 2 green tiles, 4 yellow tiles, and 1 blue tile. Liz draws a tile without looking.
   a) List the possible outcomes.
   b) What is the theoretical probability that the tile is:
      i) green? ii) yellow? iii) blue?

a) The outcomes are: Green tile, a yelow tile, and a blue tile

b) Total number of tiles is: 2 + 4 + 1 = 7 so,

i) P(green) = $\frac{2}{7}$ ii) P(yellow) = $\frac{4}{7}$ iii) P(blue) = $\frac{1}{7}$

2. There are 13 girls and 17 boys in a Grade 6 class. The teacher puts each student's name into a hat, then draws one name. The student whose name is drawn will be the first to present her or his speech. What is the theoretical probability that a girl will present first?

13 + 17 = 30 students

p(girl present) = $\frac{13}{30}$

3. Jade spins the pointer on this spinner.
   a) List the possible outcomes. Outcomes are landing black, white, red or yellow
   b) What is the theoretical probability of each outcome?
      i) The pointer lands on black.
      ii) The pointer lands on red.
      iii) The pointer lands on yellow or white.
      iv) The pointer does not land on yellow.

P(Black) = $\frac{1}{4}$ P(red) = $\frac{1}{4}$ P(Yellow or White) = $\frac{2}{4} = \frac{1}{2}$

P(Not Yellow) = $\frac{3}{4}$

4. Shen rolls a die labelled 1 to 6.
   a) List the possible outcomes.
   b) What is the probability of rolling a 1? An even number? A number greater than 4?

a) Landing on a 1,2,3,4,5,6, (6 outcomes)

b) P(roll a 1) = $\frac{1}{6}$ P(even #) = $\frac{3}{6} = \frac{1}{2}$ P(greater than 4) = $\frac{2}{6} = \frac{1}{3}$

5. A jar contains 9 black, 22 red, 26 orange, and 13 green marbles.
A marble is picked at random.
a) List the possible outcomes.
b) What is the probability of each outcome?
i) A black marble is picked.
ii) A green marble is picked.
iii) A red or an orange marble is picked.

black , red, orange and green

9+22+26+13 = 70

$$P(\text{Black picked}) = \frac{\#\text{ black}}{\text{total}} = \frac{9}{70}$$

$$P(\text{Green picked}) = \frac{\#\text{ green}}{\text{total}} = \frac{13}{70}$$

$$P(\text{Green or Orange picked}) = \frac{\#\text{ G and O}}{\text{total}} = \frac{26+13}{70} = \frac{39}{70}$$

6. A letter is chosen at random from each word listed below.
In each case, what is the probability that the letter chosen is a vowel?
a) Yukon b) Saskatchewan c) Nunavut d) Manitoba

a) $P(\text{Vowel}) = \frac{\#\text{vowel}}{\text{total letters}} = \frac{2}{5}$

b) $P(\text{Vowel}) = \frac{\#\text{vowel}}{\text{total letters}} = \frac{4}{12} = \frac{1}{3}$

c) $P(\text{Vowel}) = \frac{\#\text{vowel}}{\text{total letters}} = \frac{3}{7}$

d) $P(\text{Vowel}) = \frac{\#\text{vowel}}{\text{total letters}} = \frac{4}{8} = \frac{1}{2}$

7. An object with 10 congruent faces is a regular decahedron.
Shannon and Joshua roll a decahedron labelled 1 to 10.
a) List the possible outcomes.
b) What is the probability Shannon rolls an odd number?
c) Joshua says there is a probability of $\frac{1}{5}$ for rolling a number with a certain digit. What is the digit?

outcomes are 1,2,3,4,5,6,7,8,9,10

b) $p(\text{Odd}) = \frac{\#\text{ odd}}{\text{total}} = \frac{5}{10} = \frac{1}{2}$

c) $\frac{1}{5} = \frac{2}{10}$ The digit must occur 2 of the 10 possible outcomes.
So the digit is 1; it is in both 1 and 10

8. At a carnival, you can choose one of these wheels to spin.
To win a prize on the first wheel, the pointer must land on a star.
To win a prize on the second wheel, the pointer must land on a happy face.
Which wheel would you choose to spin?
Use words and numbers to explain your answer.

I would choose the first wheel. The probability of winning a prize on th e first wheel is 2/8= 1/4 because there are 2 stars and 8 sectors. The provability of winning a prize on the second wheel is 1/5 because there is 2 happy face and 5 sectors. 1/4 is greater rthan 1/5 so the first wheel gives me a better chance of winning.

9. This table shows the number of birthdays each month for a Grade 6 class.
A student is picked at random.
What is the probability of each event?
a) The student has a birthday in March.
b) The student has a birthday in October.
c) The student has a birthday in June, July, or August.
d) The student does not have a birthday in December.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Number of Students	2	4	3	1	5	3	2	3	3	1	1	2

total students 2+4+3+1+5+3+2+3+3+1+1+2 = 30

a) P(March bday)= $\frac{\#march}{total} = \frac{3}{30} = \frac{1}{10}$

b) P(oct bday)= $\frac{\#october}{total} = \frac{1}{30}$

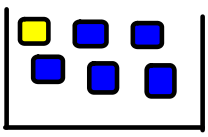
c) P(June July or Aug bday)= $\frac{\#June+July+Aug}{total} = \frac{3+2+3}{30} = \frac{8}{30} = \frac{4}{15}$

d) P(Not Dec bday)= $\frac{\#All-Dec}{total} = \frac{30-2}{30} = \frac{28}{30} = \frac{14}{15}$

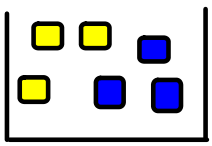
TIP

10. A bag contains 6 cubes.
The cubes are coloured blue and yellow.
Draw and colour the cubes in the bag for each probability:
a) The probability of picking a yellow cube is $\frac{1}{6}$.
b) The probability of picking a blue cube is $\frac{3}{6}$.

a)



b)



Extra Practice Probability

Lesson 1: Describing Probabilities

1. Nadine is making bead necklaces. She puts 10 blue, 5 green, 5 yellow, 12 red, and 18 black beads in a bag. She reaches into the bag without looking and pulls out a bead. For each colour of bead, use words and a fraction to describe the probability that it will be picked from the bag.

2. Rogers surveyed her classmates to find their favorite flavor of cookie. Fourteen students chose chocolate chip, 9 chose peanut butter, 2 chose oatmeal, and 1 student does not like any type of cookie. Rogers puts each student's name in a hat. She pulls out a name without looking. What is the probability that he draws the name of someone whose favourite cookie flavour is:

a) oatmeal?
b) chocolate chip?
c) coconut?
d) no favourite flavour?

1. Blue: unlikely; $\frac{10}{50}$ or $\frac{1}{5}$

Green, yellow: unlikely, equally likely; $\frac{5}{50}$ or $\frac{1}{10}$

Red: slightly more likely than blue; $\frac{12}{50}$ or $\frac{6}{25}$

Black: most likely; $\frac{18}{50}$ or $\frac{9}{25}$

2. **a)** $\frac{2}{26}$ or $\frac{1}{13}$

b) $\frac{14}{26}$ or $\frac{7}{13}$

c) 0

d) $\frac{1}{26}$

3) P(A) = #A = 3 = 1 P(B) = #B = 1
Total 9 3 Total 9

P(C) = #C = 4
Total 9

3. Anya rolls an octahedron labelled A, A, A, B, C, C, C, C.
What is the theoretical probability that the octahedron will land on each letter?

4. Eva's penny jar contains 25 pennies from 2004, 32 pennies from 2006, 17 pennies from 2007, and 26 pennies from 2008. She picks a penny from the jar at random.
a) List the possible outcomes. 25 + 32 + 17 +26 = 100 pennies
b) What is the theoretical probability of each outcome?
i) Eva picks a penny from 2007.
ii) Eva picks a penny from an even-numbered year.
iii) Eva picks a penny from a leap year.

5. Yannick is playing a game at a fun fair. Twenty-five small metal boats are floating in a large tub. On the bottom, 20 boats are marked "Too bad," 4 boats are marked "Take another turn," and 1 boat is marked "You win!" Yannick uses a magnet on a stick to pull a boat from the tub. What is the theoretical probability of each outcome?
a) Yannick loses on his first turn.
b) Yannick gets a second turn.
c) Yannick wins on his first turn.

5a) p(lose) = # Too bad = 20 = 4
total 25 5

5b) p(take turn) = # take another turn = 4
total 25

5c) p(wins) = # wins = 1
total 25

4) a) Possibilities is a 2004 penny, 2006 penny, 2007 penny and a 2008 penny

b) P(penny from 2007) = # of 2007 = 17
Total 100

ii) P(penny from even year) = # of 2004 + 2006+ 2008 pennies = 25+32+26 = 83
Total 100 100

iii) P(penny from leap year) = # of 2004 + 2008 pennies = 25+26 = 51
Total 100 100

RECALL Two types of Probability

Theoretical Probability - is what is expected to happen based on theory of math. Use a formula.

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

Ex) P(head on coin) = $\frac{\text{\# of heads}}{\text{Total sides of coin}} = \frac{1}{2}$

TODAY

Experimental Probability - is found by repeating an experiment and observing the outcomes.

10 times)

1) T 6) T
2) H✓ 7) H✓
3) T 8) H✓
4) H✓ 9) H✓
5) H✓ 10) H✓

$$P(\text{event}) = \frac{\text{number of times event occurs}}{\text{total number of trials}}$$

Example:
A coin is tossed 10 times:
A head is recorded 7 times
and a tail 3 times.

$$P(\text{head}) = \frac{7}{10}$$

$$P(\text{tail}) = \frac{3}{10}$$

$P(H) = \frac{\#H}{\text{Total}} = \frac{7}{10}$

$P(T) = \frac{\#T}{\text{Tot}} = \frac{3}{10}$

Connect

Jenny and Morningstar put coloured cubes into a bag.
They used 4 blue, 2 red, 2 green, and 2 yellow cubes.
A cube is picked from the bag at random.
The theoretical probability that a blue cube is picked is $\frac{4}{10}$, or $\frac{2}{5}$.

➤ Jenny and Morningstar planned an experiment for the class.
Each student would pick a cube from the bag without looking, then replace it.
She would do this 10 times.
Here are the results of one experiment.

Colour	Blue	Red	Green	Yellow
Number of Times	6	1	1	2

The blue cube was picked 6 times.
The **experimental probability** is the likelihood that something occurs based on the results of an experiment.

$$\text{Experimental probability} = \frac{\text{Number of times an outcome occurs}}{\text{Number of times the experiment is conducted}}$$

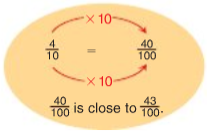
So, the experimental probability of picking a blue cube is $\frac{6}{10}$, or $\frac{3}{5}$.
This is different from the theoretical probability.

➤ Jenny and Morningstar combined the results from 10 experiments.
Here are the results for 100 trials.

Colour	Blue	Red	Green	Yellow
Number of Times	43	22	18	17

The blue cube was picked 43 times.
So, the experimental probability of picking a blue cube is $\frac{43}{100}$.

The experimental probability is close to the theoretical probability of $\frac{4}{10}$.

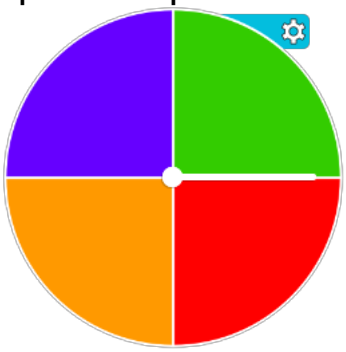


Ex $P(\text{blue}) = \frac{\#\text{ blue}}{\text{Total trial}} = \frac{6}{10} = \frac{3}{5}$

IMPORTANT

The more trials we conduct, the closer the experimental probability may come closer to the theoretical probability.

Spin the spinner 20 times record your results.



Blue	Green	Orange	Red
𝍸	𝍸	𝍸	𝍸
			1

What is the experimental probability for orange?

$P(\text{orange}) = \frac{\#\text{ orange}}{\text{total trails}} = \frac{5}{20} = \frac{1}{4}$

based on data collected

What is the theoretical probability of orange? (based from spinner)

$P(\text{orange}) = \frac{\#\text{ of orange on spinner}}{\text{Total section}}$

$= \frac{1}{4}$

Class/Homework

Page 278-279 #1, 2, 3 2c

what we expect

Theor P(fav) = # fav / Total on item

Not just the answer. Write the probability statement

Experimental P(favorable event) = # favorable Trials

(Reduce Fractions)

Test Thursday

March 12

1) Write a better question and explain why it is better than the original.

2) Given data draw a graph (Use grid paper and put all titles on it) Make 2 conclusions from the graph.

3 & 4) Given data what type of graph would you draw (Bar, line, double bar, circle) and why.

5) Theoretical Probability of picking a tile from a bag provided with the colors.

6&7) Spinner question

ab) Theoretical prob of getting a section.

c)If someone spun a spinner and recorded the results based on their result calculate the experimental prob of an even

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c)If someone spun a spinner and recorded the results based on their result calculate the experimental prob of an event

Practice

1. For each experiment, state the possible outcomes.
   a) The spinner has 3 equal sectors labelled Win, Lose, Spin Again.
   The pointer on a spinner is spun.
   b) A bag contains 6 marbles: 3 red, 2 black, and 1 blue.
   One marble is picked at random.
   c) A regular tetrahedron has 4 faces labelled 1, 2, 2, 3.
   The tetrahedron is rolled.

TIP

2. Dave tossed a coin 20 times. Heads showed 12 times.
   a) How many times did tails show?
   b) What fraction of the tosses showed heads? Tails?
   c) Are these results what you would expect? Explain.
   d) Dave tosses the coin 100 times.
   What would you expect the results to be? Explain.

3. Avril spins the pointer on this spinner several times.
Here are her results.

Blue	Orange
𝍸 𝍸 𝍸 ||	𝍸 ||

a) How many times did Avril spin the pointer?
How do you know?
b) What fraction of the spins were blue? Orange?
c) Were Avril's results what you would have expected? Explain.

4. Nina and Allegra placed 35 red tiles and 15 yellow tiles in a bag.
At random, they picked a tile from the bag, recorded its colour, and replaced it. They did this 100 times.
a) What is the theoretical probability of picking a red tile?
b) Predict how many times Nina and Allegra should get a red tile in 100 trials.
c) Nina and Allegra picked a red tile from the bag 58 times.
What is the experimental probability of picking a red tile?
d) Nina said, "I think we did something wrong." Do you agree? Why?
e) Work with a partner. Try the experiment. Record your results.
What is your experimental probability of picking a red tile?

5. A die labelled 1 to 6 is rolled.

   a) What are the possible outcomes?
   b) What is the theoretical probability of each outcome?
      i) rolling a 6
      ii) rolling an even number
      iii) rolling a 2 or a 4
      iv) rolling a number greater than 4
   c) Work with a partner. Roll a die 20 times.
      Record your results.
      What is the experimental probability of each outcome in part b?
      How do these probabilities compare with the theoretical probabilities? Explain.
   d) Combine your results with those of 4 other groups.
      What is the experimental probability of each outcome in part b?
      How do these probabilities compare with the theoretical probabilities? Explain.
      What do you think might happen if you rolled the die 500 times?

6. Zeroun and Ammon are playing a game.
   They spin the pointer on this spinner.
   If the pointer lands on an even number, Zeroun wins.
   If the pointer lands on an odd number, Ammon wins.

   a) Is this a fair game? How do you know?
   b) What is the theoretical probability of the pointer landing on an even number?
   c) Use a spinner like this one.
      Play the game at least 30 times.
      Record your results.
      Were the results what you expected? Explain.
   d) What results would you expect if you played the game 100 times? Explain how you made your prediction.