7-6 Making Predictions - Practice and Problem Solving

MAGAZINES Use the following information.
Three out of every 10 students ages 6–14 have a magazine subscription.

3. Find the probability that Annabelle has a magazine subscription.

$$P(\text{subscription}) = \frac{\text{number with a subscription}}{\text{number out of students}}$$
$$= \frac{3}{10}$$

$P(\text{subscription})$ $\frac{3}{10}$, 0.3, or 30%

VIDEO GAMES Use the following information.
Luther won 12 of the last 20 video games he played.

5. Find the probability of Luther winning the next game he plays.

$$\frac{12}{20} = \frac{12 \div 4}{20 \div 4}$$
$$= \frac{3}{5}$$

The probability is $\frac{3}{5}$, 0.6, or 60%.

SPORTS Use the table to predict the number of students out of 500 that would participate in each sport.

Sport	Students
baseball/softball	6
basketball	5
football	9
gymnastics	2
tennis	3

7. football

Find the total number of students.
$6 + 5 + 9 + 2 + 3 = 25$
9 out 25 students prefer football.

$$\frac{9}{25} = \frac{x}{500}$$

$$\frac{9 \times 20}{25 \times 20} = \frac{x}{500}$$

$$\frac{180}{500} = \frac{x}{500}$$

$$180 = x$$

About 180 students prefer football.

9. gymnastics

Find the total number of students.
$6 + 5 + 9 + 2 + 3 = 25$
2 out 25 students prefer gymnastics.

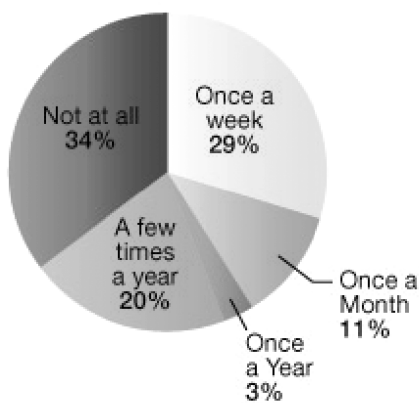$$\frac{2}{25} = \frac{x}{500}$$

$$\frac{2 \times 20}{25 \times 20} = \frac{x}{500}$$

$$\frac{40}{500} = \frac{x}{500}$$

$$40 = x$$

About 40 students prefer gymnastics.

VOLUNTEERING Use the graph.
How Often Kids Volunteer

11. About 2.8 million kids ages 10-14 live in California. Predict the number of kids that volunteer a few times a year.

20% of 2.8 million $= 0.2(2,800,000)$
$$= 560,000$$
About 560,000 kids volunteer a few times a year.

13. About 300,000 kids ages 10-14 live in South Carolina. Predict the number of kids in this age group that volunteer once a year.

3% of 300,000 = 0.03(300,000)

$$= 9,000$$

About 9,000 kids volunteer once a year.

15. **BASKETBALL** The probability of Jaden making a free throw is 15%. Predict the number of free throws that he can expect to make if he attempts 40 free throws.

15% of 40 = 0.15(40)

$$= 6$$

He can expect to make about 6 free throws.

17. **CHALLENGE** One letter tile is drawn from the bag and replaced 300 times. Predict how many times a consonant will *not* be picked.

The probability for one draw is

$$P(\text{not a consonant}) = \frac{\text{Number of favorable outcomes}}{\text{Total number of possible outcomes}}$$

$$= \frac{3}{9}$$

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

Multiply this probability by the number of draws.

$$\frac{1}{3}(300) = 100$$

The letter drawn will not be a consonant about 100 times.

19. **SELECT A TOOL** Nolan is going to listen to a CD on random mode. There are 14 songs on the CD, and 4 of them are Nolan's favorites. Which of the following tools can Nolan use to find the probability that the first song played will be one of his favorites? Justify your selection(s). Then use the tool(s) to solve the problem.

real objects	paper/pencil	technology

Sample answer: Paper/pencil; since Nolan is finding the probability, he just needs to write $\frac{4}{14}$ as a reduced fraction, $\frac{2}{7}$.

21. At the school carnival, Jesse won the balloon dart game 1 out of every 5 times he played. If he plays the game 15 more times, about how many times can he expect to win?
A   3
B   4
C   5
D   15

$$\frac{1}{5} = \frac{x}{15}$$

$$\frac{1 \times 3}{5 \times 3} = \frac{x}{15}$$

$$\frac{3}{15} = \frac{x}{15}$$

$x = 5$

The correct answer is A.

23. The table shows the results of a survey of sixth-grade students in the lunch line.

Favorite Drink	
Drink	**Students**
Chocolate Milk	15
Soda	12
Milk	6
Water	2

If there are 245 sixth graders in the school, how many can be expected to prefer chocolate milk?
F   45
G   84
H   90
J   105

Find the total number of students surveyed.
$15 + 12 + 6 + 2 = 35$
15 out of 35 students surveyed prefer chocolate milk.

$$\frac{15}{35} = \frac{x}{245}$$

$$\frac{15 \times 7}{35 \times 7} = \frac{x}{245}$$

$$\frac{105}{245} = \frac{x}{245}$$

$x = 105$
The correct answer is J.

Juanita randomly turns to a page in a 15-page booklet. Find the probability of each event.

25. $P(\text{odd page})$

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

$$= \frac{8}{15}$$

$$P(\text{odd page}) = \frac{8}{15}$$

27. $P(\text{page that is a composite number})$

$$P(\text{page that is a composite number}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

$$= \frac{8}{15}$$

$$P(\text{page that is a composite number}) = \frac{8}{15}$$

29. **INSECTS** A mosquito's proboscis, the part that sucks blood, is the first $\frac{1}{3}$ of its body's length. The rest of the mosquito is made up of the head, thorax, and abdomen. How much of a mosquito is the head, thorax, and abdomen?
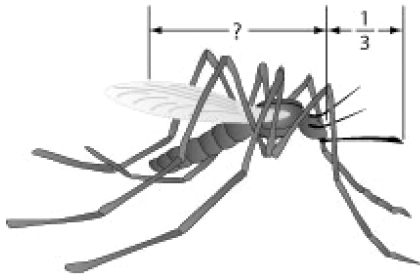
The whole length of the mosquito is 1. Rename 1 as $\frac{3}{3}$.

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

$$= \frac{2}{3}$$

So, the length of the remaining parts of the mosquito's body is $\frac{2}{3}$ of the total length of the mosquito.

Write each improper fraction as a mixed number.

31. $\frac{22}{9}$

$2\frac{4}{9}$

33. $\dfrac{50}{6}$

$8\dfrac{1}{3}$

35. **PREREQUISITE SKILL** Chandler collected $4 from each of his 28 classmates to buy a gift for their teacher. Is $150, $180, or $200 a more reasonable estimate for how much money was collected?

To estimate the amount collected you can round the numbers and calculate. $5 × 30 students = $150