1. Greg has four different colored cards in a box: yellow, red, blue, and green. He randomly selects one card, records the color, and then replaces the card in the box. If Greg does this 300 times, how many yellow cards should he expect to select?

A   50
B   75
C   100
D   150

2. Emma will roll two number cubes labeled 1 through 6. She will record the sum of the two numbers after each roll. She will roll the two cubes 540 times. How many times should Emma expect the sum to equal 5?

A   60
B   90
C   108
D   270

3. In a game, the probability of winning is 1 out of 5. How many times could Lisa expect to win if she plays the game 85 times?

A   17
B   34
C   68
D   80

4. Maddie flipped a coin 150 times. How many times could Maddie expect the coin to land on tails?

A   25
B   75
C   100
D   150

5. Each day Mr. Jackson draws a number to determine the number of problems in the homework assignment for that night. He then replaces the number. The students collected data about the numbers Mr. Jackson drew for 100 days and recorded their data in this frequency table.

Homework Assignment Data

Number of Problems	Frequency
5	9
6	16
7	15
8	18
9	22
10	20

A   1
B   5
C   9
D   10

6. John rolled a number cube, labeled 1 through 6, 200 times and recorded each of his results. *About* how many times could John expect to roll a 2 or 3?

A   35
B   50
C   67
D   100

7. A coin was tossed 80 times, out of which it landed on heads 60 times. What is the relative frequency of the coin toss resulting in tails?

A   20%
B   25%
C   50%
D   75%

8. Kaitlyn has 7 white chips, 5 red chips, and 8 blue chips in a bag.

- Without looking, Kaitlyn pulls a chip out, records the color, and puts it back in the bag.
- She does this 200 times.

About how many times could Kaitlyn expect to pull out a blue chip?

A   25
B   65
C   80
D   90

9. A farmer found 10 out of every 25 tomato plants will grow. This year, the farmer planted 200 tomato plants. How many plants can the farmer expect to grow?
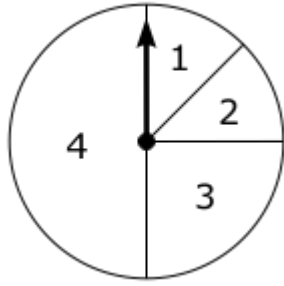
A   50
B   80
C   100
D   125

10. The probability of winning a game is 1:12. If Chloe plays the game 60 times, how many times could she expect to win?

A   5
B   8
C   12
D   30

11. Mary has a number cube labeled 2, 4, 6, 8, 10, and 12. She will roll the cube 100 times. *About* how many times could Mary expect the number cube to land on 8?

A   5
B   8
C   11
D   16

12. Jennifer will spin the spinner 600 times.

About how many times should Jennifer expect the spinner to land on a 2?

A   75
B   150
C   200
D   300

13. Kristy rolled 2 number cubes, each labeled 1 through 6. She rolled the cubes 400 times, added the two numbers showing, and recorded the results. *About* how many times should Kristy expect a sum of 8?

A   50
B   55
C   65
D   70

14. A computer randomly selects 2 visitors to the zoo out of every 225 visitors to win a free ticket to the zoo for another day. The zoo had 5,502 visitors this season. Which number is closest to the number of visitors who received a free ticket to the zoo this season?

A   12
B   24
C   48
D   88

18. Kris has a bag that contains only red marbles, green marbles, and purple marbles. Kris pulls a marble from the bag, records the color of the marble, and puts it back in the bag. She performs 25 pulls and draws 8 red marbles, 12 green marbles, and 5 purple marbles. Based on the data, about how many times would Kris pull a red marble if she performed 1,000 pulls?
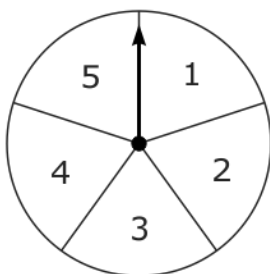
A. 200

B. 320

C. 330

D. 470

19. Amy will spin the spinner 575 times.

About how many times should Amy expect to land on an odd number?

A. 200

B. 250

C. 350

D. 400

20.

The probability of winning a certain game is $\frac{5}{8}$. If the game is played 500 times, *about* how many times would someone be expected to lose?

A. 100

B. 200

C. 300

D. 400

21. Anthony has a bag that contains 4 blue candies, 6 green candies, and 10 yellow candies.
- Without looking, he pulls out a piece of candy, records the color, and then puts it back in the bag.
- He does this 150 times.

How many times could Anthony expect to pull out a blue candy?

A. 30

B. 40

C. 50

22. Mike will roll two number cubes labeled 1 through 6. After each roll, he adds the two numbers showing and records the result. He will roll the cubes 500 times. *About* how many times can he expect a sum greater than 8?

    A. 40

    B. 80

    C. 140

    D. 210

23. Erica has a number cube, labeled 1 through 6. She will roll the cube 300 times. How many times should Erica expect the cube to land on the number 5?

    A. 25

    B. 30

    C. 50

    D. 60

25. A spinner is equally divided into 6 sections numbered 1 through 6. If the spinner is spun 300 times, approximately how many times should the arrow land on a 2 or a 3?

   A. 50

   B. 100

   C. 150

   D. 200

26. Robert will roll a number cube, labeled 1 through 6, a total of 200 times. *About* how many times could Robert expect to roll a number greater than 4?

   A. 30

   B. 50

   C. 70

   D. 100

27. Ben rolls a number cube 50 times. He records the result of each roll in the table below.

RESULTS OF ROLLING NUMBER CUBE

Outcome	1	2	3	4	5	6
Frequency	7	6	5	11	10	11

Based on the data, which statement is true?

A. Ben will roll an even number about 250 times if the number cube is rolled 500 times.

B. Ben will roll an even number about 220 times if the number cube is rolled 500 times.

C. Ben will roll an even number about 700 times if the number cube is rolled 1,000 times.

D. Ben will roll an even number about 560 times if the number cube is rolled 1,000 times.

28. In a factory, a sample of 40 light bulbs was selected from a box of 1,000 light bulbs. In the sample, 2 light bulbs would not work. Based on this sample, how many non-working light bulbs would be expected in the group of 1,000 light bulbs?

A. 15

B. 25

C. 30

D. 50

29. Esme has 1,200 songs saved on her phone. The types of songs are listed in the table.

Music Type	Number of Songs
rap	195
rock	266
pop	315
country	424

If Esme's phone is set to randomly select music, about how often can she expect to hear a rock song?

A. one out of every six songs

B. one out of every five songs

C. one out of every four songs

D. one out of every three songs

30. In a store, a sample of 60 pens was selected from a box of 1,200 pens. Of these 60, 4 pens did not work. *About* how many pens could be expected to not work in the group of 1,200 pens?
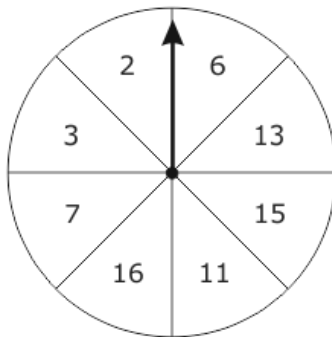
    A. 80

    B. 40

    C. 60

    D. 20

31. Noah spun the spinner below 120 times.

About how many times could Noah expect the spinner to land on an odd number?

    A. 75

    B. 60

    C. 25

32. Andy rolled a number cube labeled 1 through 6. He rolled the number cube 500 times and recorded the results of each roll. ***About*** how many times could Andy expect to roll a 5?

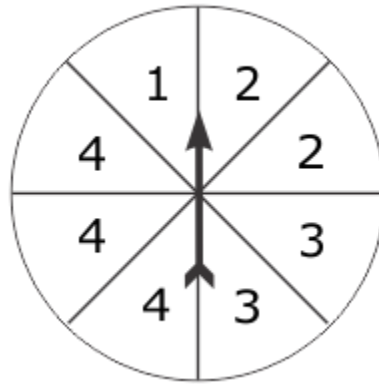   **A.** 60

    B. 80

    C. 100

33. Eric tossed two coins in the air at the same time. He recorded the results of each toss. He tossed the coins 100 times. ***About*** how many times could Eric expect both coins to land on heads?

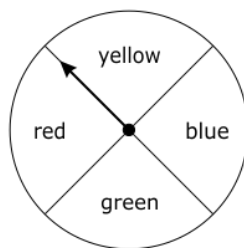   **A.** 25

    B. 50

    C. 75

35. Rosa will spin the spinner below 400 times and record each result.

About how many times should Rosa expect the spinner to land on a 3?

A. 100

B. 150

C. 200

D. 250

36. Fred will spin the spinner below 150 times.

About how many times could Fred expect the spinner to land on blue?

A. 30

B. 38

C. 50

37. A number cube has sides labeled 1 to 6. Sue will roll the cube 48 times. How many times should Sue expect to roll a 5?

A. 5

B. 7

C. 8

D. 10

38. A bag contains 6 blue chips, 3 red chips, 9 green chips, and 2 yellow chips.
- John pulls a chip out, records the colors, and returns the chip to the bag.
- He does this 200 times.

How many times should John expect the color to be blue, red, or yellow?

A. 90

B. 110

C. 120

D. 150

39. Hannah will roll a number cube, labeled 1 through 6, 300 times. **About** how many times could Hannah expect to roll a number less than 4?

A. 50

B. 100

C. 150

D. 200

41. The probability of picking a quarter from a jar of coins is 0.125. If Noah has 250 coins in the jar, **about** how many quarters are in the jar?

    A. 25

    B. 30

    C. 35

    D. 40

42. A fruit juice company uses a machine to fill juice bottles. On average, the machine makes an error in the amount of juice it adds to 1 out of every 40 bottles.
Part 1. On average, how many errors would the machine make if it filled 600 bottles with juice?
The company is going to purchase a second machine. This machine makes 1 error out of every 125 bottles.
Part 2. How many fewer errors would the new machine make than the first machine if each of them fill 1,000 bottles with juice?
The company can add a device to the second machine that will identify mistakes and fix them. The device will fix 98% of the mistakes the machine makes. Each mistake the device fixes will save the company about $0.25.
Part 3. How many bottles of juice on average could be filled by the second machine before a total of 10 mistakes are not fixed by the device?
Part 4. The device costs $500. How many bottles of juice would be filled by the second machine before the savings from the device would equal its cost?
Use words, numbers, and/or pictures to show your work.

43. Susan has a number cube labeled 1 to 6. She will roll the cube 100 times. How many times could Sue expect to roll an even number?

   A. 3

   B. 25

   C. 50

   D. 60

44. Alice has 2 number cubes, labeled 1 to 6. She will roll the number cubes, add the numbers showing, and record the results. She will do this 900 times. How many times could Alice expect the two number cubes to have a sum of 2?

   A. 25

   B. 75

   C. 150

   D. 450

45. Mary will spin the spinner below 300 times.
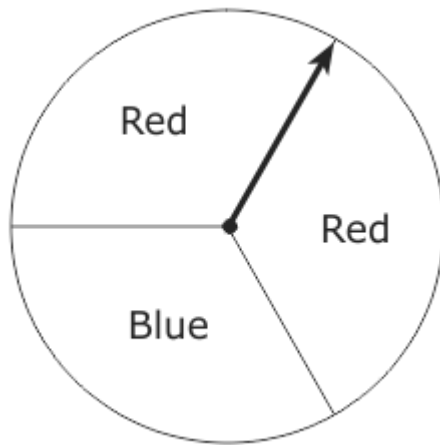
About how many times could Mary expect the spinner to land on blue?

A. 50

B. 100

C. 150

D. 200

46. Mary has a number cube, labeled 1 through 6. She rolled it 300 times and recorded each result. How many times should she expect to roll a number less than 5?

A. 100

B. 150

C. 200

D. 250

47. Jenna is trying to invent her own ways of generating random numbers. To do this, she will flip a coin, roll a number cube, and spin a spinner.

First, Jenna flips the coin 20 times. Her results are as follows.

heads, heads, tails, heads, tails, tails, heads, heads, heads, heads, tails, heads, tails, tails, heads, heads, heads, tails, heads, heads

Next, Jenna rolls a number cube 20 times. Her results are as follows.

5, 2, 2, 6, 3, 3, 1, 2, 4, 6, 4, 2, 3, 1, 5, 4, 2, 2, 3, 5

Part A. For Jenna's coin flips, identify the experimental probabilities of landing on heads and landing on tails. Be sure to show your work.

Part B. Use the probabilities you determined in part A to estimate the number of times a fair coin would land on heads if it were flipped 500 times. Tell whether this estimate would be likely to be accurate.

Part C. For Jenna's number cube rolls, find the experimental probability of rolling each number. Be sure to show your work.

Part D. Use the probabilities you determined in part C to estimate the number of times the cube would show a number greater than 4 if it were rolled 300 times. Be sure to show your work.

In order to make a random number, Jenna will roll a number cube and spin a spinner and then add the numbers that are shown. She will then flip a coin, and if the coin lands on tails, she will subtract 1 from her number. If the coin lands on heads, she will not change the number. This way, Jenna can generate a random integer from 1 through 10.
Assume that the spinner has an equal probability of landing on each number, 1 through 4.

Using Jenna's method, there is more than one way to generate some numbers. For example, a 4 can be made by the cube rolling a 1, the spinner landing on 4, and the coin showing tails; a 4 can also be made by the cube rolling a 2, the spinner landing on 2, and the coin showing heads.

Part E. Find all the ways that Jenna's method could generate the number 9.

Part F. Using the experimental probabilities you found in parts A and C, find the probability of each way that Jenna's method can generate a 9. Use these probabilities to estimate the number of times 9 would be generated while using Jenna's method 400 times.

48. Erin rolled a number cube with sides labeled 1 through 6. She rolled the number cube 400 times and recorded each result. *About* how many times could Erin expect to roll a 4?

A. 70

B. 100

C. 130

49. Maria will flip a coin 300 times and record her results. *About* how many times could Maria expect the coin to land on tails?

A. 50

B. 100

C. 150

D. 200

50. Martin will roll a number cube 150 times. The number cube is labeled 1 to 6. How many times could Martin expect to roll a number greater than 2?

A. 25

B. 50

C. 75

D. 100

51. A store manager checks each shipment of produce and removes any rotten pieces. In a shipment of 50 cabbages, the manager usually finds that 2 of them are rotten. *About* how many rotten cabbages would the manager expect in a shipment of 125 cabbages?
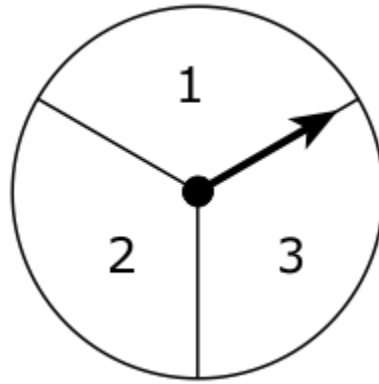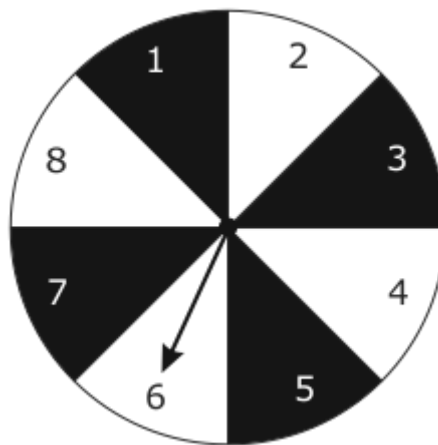
A. 17

B. 13

C. 9

D. 5

52. Chad will spin the spinner below 600 times and record each result.

About how many times should Chad expect the spinner to land on either 1 or 2?

A. 100

B. 200

C. 300

D. 400

53. Ann spun the spinner below 300 times and recorded each of her results.
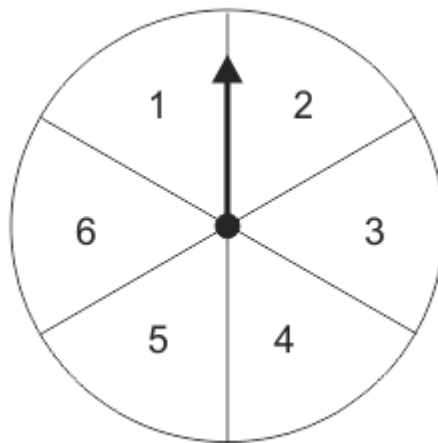

How many times could Ann expect to spin a number greater than 6?

A. 50

B. 75

C. 100

54. If a fair cube numbered 1 through 6 is rolled 300 times, about how many times can it be expected to land on 5?

A. 13

B. 27

C. 52

D. 65

55. Jane will spin the spinner below 30 times.

How many times would Jane expect it to land on an even number?

A. 5

B. 6

C. 10

D. 15

56. Nick randomly selects a colored paperclip from a bag of paperclips that are all the same size. He records the result, and then replaces the paperclip.

Paperclip Color	Times Selected
red	23
green	25
blue	52

Based on Nick's results, which statement best describes the likely numbers of each color of paperclip in the bag?

**A.** The bag contains the same number of red, green, and blue paperclips.

B. The bag contains the least number of red paperclips, and twice as many blue as green paperclips.

C. The bag contains the same number of green and red paperclips, but with twice as many blue paperclips.

D. The bag contains the same number of green and blue paperclips, but with twice as many red paperclips.

57. Kathy spins the spinner below 120 times.
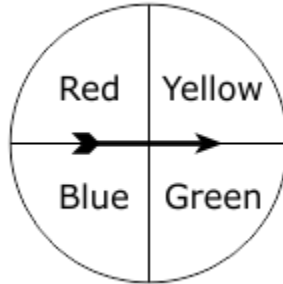
How many times is the spinner expected to land on yellow?

A. 10

B. 30

C. 40

D. 60

58. Jason has two number cubes, labeled 1 through 6. He will roll the cubes 300 times and then add the results after each roll. ***About*** how many times should Jason roll a sum of 5?

A. 25

B. 33

C. 48

D. 112

59. A number cube with faces labeled 1 through 6 is rolled 200 times. About how many times would you expect to roll an even number?