Experimental Probability Worksheet

Show your work!

Name: Key Per:_____

1.) What is the theoretical probability that an even number will be rolled on a number cube?

$\frac{1}{2}$

2.) What was the experimental probability of how many times an even number was actually rolled using the table?

$\frac{15}{36} = \frac{5}{12}$

3.) Theoretically if you roll a number cube 36 times, how many times would you expect to roll the number one?

$\frac{1}{6} \times 36 =$ 6 times

# on Cube	Frequency
1	8
2	3
3	9
4	6
5	4
6	6

4.) How many times did you actually roll the number one in the experiment?

8 times

5.) What is the theoretical probability for rolling a number greater than 4?

$\frac{2}{6} = \frac{1}{3}$

6.) What was the experimental probability of rolling a number greater than 4?

$\frac{10}{36} = \frac{5}{18}$

7.) What is the difference between theoretical and experimental probability?

8.) If a car factory checks 360 cars and 8 of them have defects, how many will have defects out of 1260?

$\frac{8}{360} = \frac{1}{45}$ $\frac{1}{45} \times 1260 = 28$

9.) If a car factory checks 320 cars and 12 of them have defects, how many out of 560 will **NOT** have defects?

$\frac{308}{320} = \frac{77}{80}$ $\frac{77}{80} \times 560 = 539$

10.) You plant 30 African violet seeds and 9 of them sprout. Use experimented probability to predict how many will sprout if you plant 20 seeds?

$\frac{9}{30} = \frac{3}{10}$ $\frac{3}{10} \times 20 = 6$

11.) If you are picking a number between 1-20 what is the probability that you will pick a number greater than 14 or less than 4?

6 + 3

$\frac{9}{20}$

12.) If you are picking a number between 1-20 what is the probability that you will pick an even number or a multiple of three?

10 + 6 but 6, 12 and 18 are both! so we can't count them twice

13/20

13.) If you are picking a number between 1-20 what is the probability that you will pick a multiple of two or a number greater than 15?

10 + 17, 19 $\Rightarrow \frac{12}{20} = \frac{3}{5}$

14.) Amanda used a standard deck of 52 cards and selected a card at random. She recorded the suit of the card she picked, and then replaced the card. The results are in the table to the right.

Diamonds	𝍸 ||	7
Hearts	𝍸 ||||	9
Spades	𝍸 𝍸 |	11
Clubs	|||	3

/30

a.) Based on her results, what is the experimental probability of selecting a heart?

9/30 = 3/10

b.) What is the theoretical probability of selecting a heart?

1/4

c.) Based on her results, what is the experimental probability of selecting a diamond or a spade?

18/30 = 3/5

d.) What is the theoretical probability of selecting a diamond or a spade?

2/4 = 1/2

e.) Compare these results, and describe your findings.

The experimental probability and theoretical probability is different.

15) Dale conducted a survey of the students in his classes to observe the distribution of eye color. The table shows the results of his survey.

Eye color	Blue	Brown	Green	Hazel
Number	12	58	2	8

a.) Find the experimental probability distribution for each eye color.

P(blue)= $\frac{12}{80} = \frac{3}{20}$ P(brown)= $\frac{58}{80} = \frac{29}{40}$ P(green)= $\frac{2}{80} = \frac{1}{40}$ P(hazel)= $\frac{8}{80} = \frac{1}{10}$

b.) Based on the survey, what is the experimental probability that a student in Dale's class has blue or green eyes?

14/80 = 7/40

c.) Based on the survey, what is the experimental probability that a student in Dale's class does not have green or hazel eyes?

70/80 = 7/8

d.) If the distribution of eye color in Dale's grade is similar to the distribution in his classes, about how many of the 360 students in his grade would be expected to have brown eyes?

$\frac{29}{40} \times 360 = 261$

16.) Your sock drawer is a mess! You just shove all of your socks in the drawer without worrying about finding matches. Your aunt asks how many pairs of each color you have. You know that you have 32 pairs of socks, or 64 individual socks in four different colors: white, blue, black, and tan. You do not want to count all of your socks, so you randomly pick 20 individual socks and predict the number from your results.

Color of sock	White	Blue	Black	Tan
# of socks	12	1	3	4

a.) Find the experimental probability of each

P(white) = $\frac{12}{20} = \frac{3}{5}$ = 60% P(blue) = $\frac{1}{20}$ = 5% P(black) = $\frac{3}{20}$ = 15% P (tan) = $\frac{4}{20} = \frac{1}{5}$ = 25%

b.) Based on your experiment, how many socks of each color are in your drawer?

(white) = 38 ($\frac{3}{5} \times 64 = 38.4$) (blue) = 3 ($\frac{1}{20} \times 64 = 3.2$) (black) = 10 ($\frac{3}{20} \times 64 = 9.6$) (tan) = 13 ($\frac{4}{20} \times 64 = 12.8$)

c.) Based on your results, how many <u>pairs</u> of each sock are in your drawer?

(white) = 19 ($\frac{3}{5} \times 32 = 19.2$) (blue) = 2 ($\frac{1}{20} \times 32 = 1.6$) (black) = 5 ($\frac{3}{20} \times 32 = 4.8$) (tan) = 6 ($\frac{4}{20} \times 32 = 6.4$)

d.) Your drawer actually contains 16 pairs of white socks, 2 pairs of blue socks, 6 pairs of black socks, and 8 pairs of tan socks. How accurate was your prediction?

Pretty close.

Exercises 17 – 24: A single die is rolled. Find the theoretical probability of each.

17. P(3) = $\frac{1}{6}$ 18. P(9) = 0 19. P(even #) = $\frac{1}{2}$

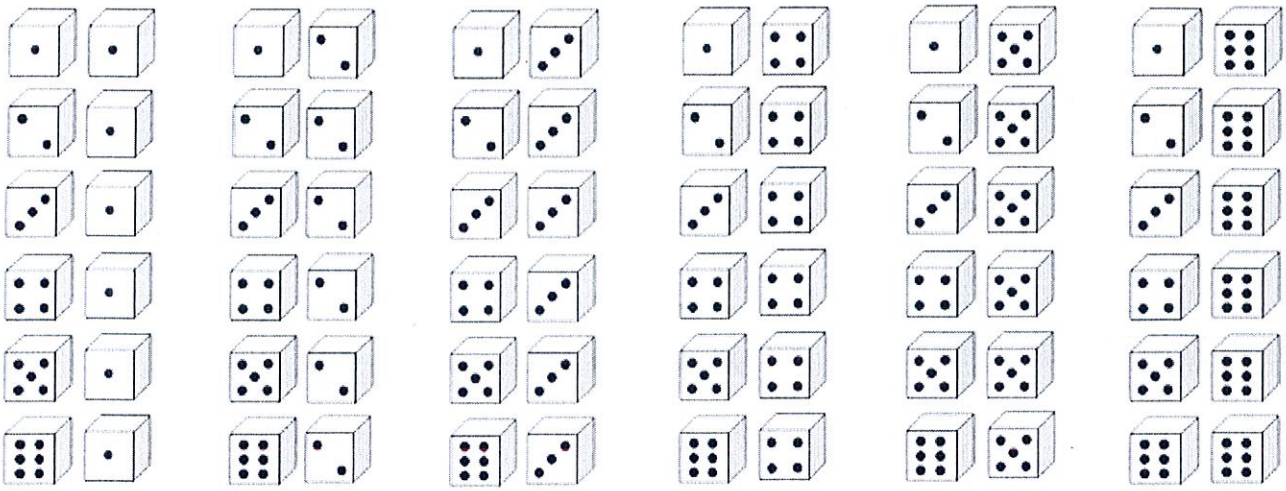
20 P(a # > 1) = $\frac{5}{6}$ 21. P(a # < 1) = 0 22. P(a # < 7) = 1

23. P(a # divisible by 4) = $\frac{1}{6}$ 24. P(a # 3 or greater) = $\frac{2}{3}$

Exercises 25 – 28: Find the <u>odds</u> in favor of each outcome if a single die is rolled.

25. A # 3 _____ 26. A # divisible by 4 _____

27. A # 3 or greater _____ 28. An even # _____



Exercises 29 – 36: 2 dice are rolled. Find the theoretical probability of each.

29. P(sum of 2) = $\frac{1}{36}$

30. P(sum of odd #) = $\frac{18}{36} = \frac{1}{2}$

31. P(sum of even #) = $\frac{18}{36} = \frac{1}{2}$

32. P(sum > 6) = $\frac{21}{36} = \frac{7}{12}$

33. P(sum of < 10) = $\frac{30}{36} = \frac{5}{6}$

34. P(sum of < 8) = $\frac{21}{30} = \frac{7}{12}$

35. P(sum of 11) = $\frac{2}{36} = \frac{1}{18}$

36 . P(sum of 5 or greater) = $\frac{30}{36} = \frac{5}{6}$

Exercises 37 – 46: Find the odds in favor of each outcome if 2 dice are rolled.

37. A sum of 2 _____

38. A sum > 6 _____

39. A sum < 10 _____

40. A sum is an odd # _____

41. A sum is an even # _____

42. A sum < 8 _____

43. A sum of 11 _____

44. A sum of 7 or 11 _____

45. A sum of 5 or greater _____

46. A sum of 4 or 9 _____