LESSON MAKER PRO

Chance Check

Compare predicted chance with real results.

GRADE 7 · 7.PS.1.d

7.PS.1.d "Investigate and describe the difference between the probability of an event found through experiment or simulation versus the theoretical probability of that same event."

NAME _____ DATE _____

TWO WAYS TO FIND CHANCE

Theoretical probability uses equally likely outcomes: favorable outcomes/total outcomes. Experimental probability uses results from trials: times the event happened/number of trials. The two probabilities may be different.

WORKED EXAMPLE

A website has 7 equal banner designs. Two designs are red. In 35 page loads, a red banner appears 9 times.

1. Theoretical P(red) = 2/7.
2. Experimental P(red) = 9/35.
3. 2/7 = 10/35, so the experimental probability is less.

Answer: Theoretical: 2/7. Experimental: 9/35.

PRACTICE 5 problems

1 A fair number cube is rolled 48 times. An even number appears 25 times. Find both probabilities. Which is greater?

ANSWER _____

2 A bag has 3 star cards and 5 plain cards. With replacement, a star is drawn 13 times in 40 draws. Find both probabilities. Which is greater?

ANSWER _____

3 A fair coin is flipped 30 times. Tails appears 17 times. Find both probabilities. Which is greater?

ANSWER _____

4 A spinner has 4 equal sections. One section is blue. It lands on blue 18 times in 72 spins. Find both probabilities.

ANSWER _____

5 A game has 10 equal tiles. Four are prize tiles. A prize appears 26 times in 60 plays. Find both probabilities. Which is greater?

ANSWER _____

APPLY IT Show your work

1 At robotics club, a randomizer has 12 equal icons. Three icons mean "code challenge." In 48 trials, code challenge appears 13 times. Find the theoretical and experimental probabilities. How much greater is the experimental probability?

WORK SPACE

ANSWER _____

2 A music app has 8 equal playlist choices. Three choices play hip-hop. In 56 picks, hip-hop plays 17 times. Find the theoretical and experimental probabilities. How much less is the experimental probability?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A game has 4 equal outcomes, and one outcome is the target. Kai gets the target 13 times in 44 trials. Lina gets it 32 times in 116 trials. Whose experimental probability is closer to the theoretical probability? Explain by comparing the differences.

WORK SPACE AND ANSWER

ANSWER KEY

Chance Check

GRADE 7 · 7.PS.1.d

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A fair number cube is rolled 48 times. An even number appears 25 times. Find both probabilities. Which is greater?	**Theoretical: 1/2. Experimental: 25/48. Experimental is greater.**
2	A bag has 3 star cards and 5 plain cards. With replacement, a star is drawn 13 times in 40 draws. Find both probabilities. Which is greater?	**Theoretical: 3/8. Experimental: 13/40. Theoretical is greater.**
3	A fair coin is flipped 30 times. Tails appears 17 times. Find both probabilities. Which is greater?	**Theoretical: 1/2. Experimental: 17/30. Experimental is greater.**
4	A spinner has 4 equal sections. One section is blue. It lands on blue 18 times in 72 spins. Find both probabilities.	**Theoretical: 1/4. Experimental: 18/72 = 1/4. They are equal.**
5	A game has 10 equal tiles. Four are prize tiles. A prize appears 26 times in 60 plays. Find both probabilities. Which is greater?	**Theoretical: 2/5. Experimental: 13/30. Experimental is greater.**

PART 2 · APPLY IT

1. **Theoretical: 1/4. Experimental: 13/48. The experimental probability is greater by 1/48.** Write 1/4 as 12/48. Then subtract 12/48 from 13/48.
2. **Theoretical: 3/8. Experimental: 17/56. The experimental probability is less by 1/14.** Write 3/8 as 21/56. The difference is 21/56 - 17/56 = 4/56 = 1/14.

CHALLENGE

Theoretical probability is 1/4. Kai: 13/44, which is 1/22 away from 1/4. Lina: 32/116 = 8/29, which is 3/116 away from 1/4. Lina is closer because 3/116 is less than 1/22.

Accept equivalent fractions, including unsimplified experimental fractions. Accept comparison statements such as higher, lower, greater, less, or equal when matched to the correct probabilities.