LESSON MAKER PRO

Chance Check

Compare simulation results with what probability predicts.

GRADE 7 · 7.DS.C.5.b

7.DS.C.5.b "Use a known or estimated probability to evaluate whether the number of outcomes in a given number of simulation trials is reasonable."

NAME _____ DATE _____

EXPECTED OUTCOMES

Multiply the probability of an outcome by the number of trials to find its expected count. A result near that count is reasonable. A result far from it is surprising, though it can still happen by chance.

WORKED EXAMPLE

A game was simulated using the information in the table. Is the number of wins reasonable?

Chance of a win	Trials	Wins
3/8	16	7

1. Expected wins: 3/8 × 16 = 6.
2. The result is 7 wins, which is close to 6.

Answer: Yes, 7 wins is reasonable.

PRACTICE 4 problems

1 The chance of a win is 1/4. In 20 trials, there are 5 wins. Find the expected wins. Is the result reasonable?

ANSWER _____

2 The chance of a win is 1/2. In 24 trials, there is 1 win. Find the expected wins. Is the result reasonable?

ANSWER _____

3 The chance of a win is 2/5. In 25 trials, there are 11 wins. Find the expected wins. Is the result reasonable?

ANSWER _____

4 The chance of a win is 1/5. In 50 trials, there are 30 wins. Find the expected wins. Is the result reasonable?

ANSWER _____

APPLY IT Show your work

1 A game gives a rare badge with probability 1/4 each round. A player gets 9 badges in 40 rounds. Is that reasonable? Show the expected count.

WORK SPACE

ANSWER _____

2 A playlist has a 1/5 chance of playing a song by a favorite artist on each shuffle. It plays 25 such songs in 45 shuffles. Is that reasonable? Show the expected count.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two games were each simulated 40 times. Which result is reasonable? Find both expected counts and explain your choice.

Game	Win chance	Trials	Wins
A	1/4	40	19
B	1/2	40	19

WORK SPACE AND ANSWER

ANSWER KEY

Chance Check

GRADE 7 · 7.DS.C.5.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The chance of a win is 1/4. In 20 trials, there are 5 wins. Find the expected wins. Is the result reasonable?	**5 expected wins. Yes, the result matches.**
2	The chance of a win is 1/2. In 24 trials, there is 1 win. Find the expected wins. Is the result reasonable?	**12 expected wins. No, 1 is far from 12.**
3	The chance of a win is 2/5. In 25 trials, there are 11 wins. Find the expected wins. Is the result reasonable?	**10 expected wins. Yes, 11 is close to 10.**
4	The chance of a win is 1/5. In 50 trials, there are 30 wins. Find the expected wins. Is the result reasonable?	**10 expected wins. No, 30 is far from 10.**

PART 2 · APPLY IT

1. **Yes. The expected count is 10 badges, and 9 is close to 10.** Multiply 1/4 by 40 to get 10 expected badges. Compare 9 with 10.
2. **No. The expected count is 9 songs, and 25 is far from 9.** Multiply 1/5 by 45 to get 9 expected songs. Compare 25 with 9.

CHALLENGE

Game B is reasonable. Game A has 10 expected wins, so 19 is far from expected. Game B has 20 expected wins, so 19 is close to expected.

Accept equivalent explanations that compare each observed count with its expected count. A surprising result is not impossible.