LESSON MAKER PRO

Chance Check

Compare a probability model with what happened.

GRADE 7 · 7.DSP.C

7.DSP.C "Investigate probability models."

NAME _____ DATE _____

TWO KINDS OF PROBABILITY

A probability model predicts a chance: favorable equally likely outcomes / all equally likely outcomes. Experimental probability uses results: times the event happened / total trials. Compare the two probabilities to see how closely the results fit the model.

WORKED EXAMPLE

A spinner has 7 equal sections, and 2 are green. In 35 spins, it lands on green 13 times. Is the experimental probability greater or less than the model probability?

1. Experimental probability = 13/35.
2. Model probability = 2/7 = 10/35.
3. Compare: 13/35 > 10/35.

Answer: The experimental probability is greater by 3/35.

PRACTICE 6 problems

1 A game was played 36 times. Use the results to find the experimental probability of getting a star.

GAME RESULTS

Outcome	Times
Star	9
Circle	27

ANSWER _____

2 A spinner has equal-sized sections. Use the table to find the model probability of landing on the moon.

SPINNER SECTIONS

Picture	Sections
Moon	4
Sun	5

ANSWER _____

3 A bag has 1 red token and 4 blue tokens. A token is drawn, put back, and drawn again for each trial. Find the experimental probability of red. Is it greater or less than the model probability?

DRAW RESULTS

Color	Times drawn
Red	15
Blue	45

ANSWER _____

4 A spinner has 6 equal sections, and 1 is striped. Based on the model, how many striped results would you expect in 54 spins?

ANSWER _____

5 A game model gives a 1/2 chance of a hit. Which batch has an experimental probability closer to the model? How far from 1/2 is that batch's probability?

GAME BATCHES

Batch	Hits	Attempts
A	9	12
B	21	36

ANSWER _____

6 Model X gives a 1/4 chance of a win. Model Y gives a 1/6 chance. Which model matches the experimental probability exactly?

GAME RESULTS

Outcome	Times
Win	8
No win	40

ANSWER _____

APPLY IT Show your work

1 A music app chooses at random from a playlist of 5 rock songs, 9 pop songs, and 6 hip-hop songs. Each song is equally likely each time. In 80 plays, it picks a rock song 28 times. Find the model and experimental probabilities of rock. How much greater is one than the other?

WORK SPACE

ANSWER _____

2 In a video game, a prize wheel has 6 equal sections, and 1 awards a bonus. A player spins 90 times and gets 21 bonuses. How many bonuses does the model predict? How many more did the player get? Does this prove the wheel is unfair? Explain briefly.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two game designers suggest different models for a bonus: Model A gives a 1/5 chance, and Model B gives a 1/3 chance. In 90 plays, a tester gets 26 bonuses. Find the number each model predicts. Which model fits these results more closely? Does this prove that model is correct? Explain.

WORK SPACE AND ANSWER

ANSWER KEY

Chance Check

GRADE 7 · 7.DSP.C

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A game was played 36 times. Use the results to find the experimental probability of getting a star.	**9/36 = 1/4**
2	A spinner has equal-sized sections. Use the table to find the model probability of landing on the moon.	**4/9**
3	A bag has 1 red token and 4 blue tokens. A token is drawn, put back, and drawn again for each trial. Find the experimental probability of red. Is it greater or less than the model probability?	**Experimental: 15/60 = 1/4. Model: 1/5. The experimental probability is greater.**
4	A spinner has 6 equal sections, and 1 is striped. Based on the model, how many striped results would you expect in 54 spins?	**9 striped results**
5	A game model gives a 1/2 chance of a hit. Which batch has an experimental probability closer to the model? How far from 1/2 is that batch's probability?	**Batch B; 21/36 = 7/12, which is 1/12 from 1/2.**
6	Model X gives a 1/4 chance of a win. Model Y gives a 1/6 chance. Which model matches the experimental probability exactly?	**Model Y; 8/48 = 1/6.**

PART 2 · APPLY IT

1. **Model: 1/4. Experimental: 7/20. Experimental is greater by 1/10.** The model gives 5/20 = 1/4, and the results give 28/80 = 7/20. Subtract 5/20 from 7/20 to get 2/20 = 1/10.
2. **The model predicts 15 bonuses. The player got 6 more. No, results can vary by chance.** Compute 90 × 1/6 = 15, then 21 - 15 = 6. A difference between the prediction and the results does not prove the wheel is unfair.

CHALLENGE

Model A predicts 18 bonuses, and Model B predicts 30. Model B is closer: 26 is 4 away from 30 but 8 away from 18. This does not prove Model B is correct because results can vary by chance.

Accept equivalent fractions and comparisons. For questions about whether results prove a model, accept a clear explanation that experimental results can vary by chance.