LESSON MAKER PRO

Chance Data Detectives

Use trial results to build probability models.

GRADE 7 · 7.PR.6.5

7.PR.6.5 "Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process."

NAME _____ DATE _____

MODEL WHAT HAPPENED

A probability model uses data from repeated chance trials. For each outcome, divide its frequency by the total number of trials. The probabilities should add to 1, even when outcomes are not equally likely.

WORKED EXAMPLE

A digital spinner was used 48 times. It landed on purple 18 times. Use the data to make a probability model for landing on purple.

1. Total trials = 48.
2. P(purple) = 18/48.
3. Divide numerator and denominator by 6: 3/8.

Answer: P(purple) = 3/8.

PRACTICE 6 problems

1 A game randomizer chose a blue token 12 times in 35 trials. Use the data to find P(blue).

ANSWER _____

2 A tile app selected a striped tile 9 times in 25 selections. Use the data to find P(striped).

ANSWER _____

3 A robot picked a green bead 7 times in 30 picks. Use the data to find P(not green).

ANSWER _____

4 A virtual number cube was rolled 60 times, and it showed a six 11 times. Based on this model, how many sixes are predicted in 120 rolls?

ANSWER _____

5 A game spinner was spun 44 times. It landed on a star 16 times, a moon 17 times, and a sun 11 times. Write a probability model for all three outcomes.

ANSWER _____

6 A card-pack simulator was opened 45 times. Sixteen packs had a rare card. Based on the data, is getting a rare card or not getting a rare card more likely? Give the probability of the more likely event.

ANSWER _____

APPLY IT Show your work

1 At the school esports club, a prize wheel is spun 80 times. It gives a sticker 28 times, a bracelet 20 times, and a key chain 32 times. Create a probability model for the prizes. Then predict how many key chains the wheel will give in 40 more spins.

WORK SPACE

ANSWER _____

2 A music app's shuffle feature picked songs from a playlist 75 times. It selected hip-hop 21 times, pop 17 times, rock 15 times, and other genres 22 times. Develop a model for the chance that the next song will not be pop. Then predict how many of the next 150 songs will not be pop.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A game reward wheel was spun 90 times. It landed on a badge 27 times, an avatar 24 times, coins 19 times, and a bonus turn 20 times. Create a probability model for all four outcomes. A player wants a model that predicts at least 50 badges. What is the smallest number of future spins needed? Explain your reasoning.

WORK SPACE AND ANSWER

ANSWER KEY

Chance Data Detectives

GRADE 7 · 7.PR.6.5

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A game randomizer chose a blue token 12 times in 35 trials. Use the data to find P(blue).	**12/35**
2	A tile app selected a striped tile 9 times in 25 selections. Use the data to find P(striped).	**9/25**
3	A robot picked a green bead 7 times in 30 picks. Use the data to find P(not green).	**23/30**
4	A virtual number cube was rolled 60 times, and it showed a six 11 times. Based on this model, how many sixes are predicted in 120 rolls?	**22**
5	A game spinner was spun 44 times. It landed on a star 16 times, a moon 17 times, and a sun 11 times. Write a probability model for all three outcomes.	**P(star) = 4/11, P(moon) = 17/44, P(sun) = 1/4**
6	A card-pack simulator was opened 45 times. Sixteen packs had a rare card. Based on the data, is getting a rare card or not getting a rare card more likely? Give the probability of the more likely event.	**Not getting a rare card is more likely, with probability 29/45.**

PART 2 · APPLY IT

1. **P(sticker) = 7/20, P(bracelet) = 1/4, P(key chain) = 2/5; predicted key chains = 16** Use each prize frequency over 80 to make the model. Multiply 2/5 by 40 to predict 16 key chains.
2. **P(not pop) = 58/75; predicted non-pop songs = 116** Add the non-pop frequencies, then divide 58 by 75. Multiply 58/75 by 150 to get 116.

CHALLENGE

P(badge) = 3/10, P(avatar) = 4/15, P(coins) = 19/90, P(bonus turn) = 2/9. The smallest number of future spins is 167

Accept equivalent fractions and probability models whose probabilities add to 1. Predictions should be based on the observed-frequency model, and fractional expected values may be rounded only when the question asks for a number of items.