LESSON MAKER PRO

Patterns in Chance

Use simulation results to make predictions.

GRADE 7 · 7.DSP.C.15.a

7.DSP.C.15.a "Observe the relative frequency of an event over the long run, using simulation or technology, and use those results to predict approximate relative frequency."

NAME _____ DATE _____

THE BIG IDEA

Relative frequency is the number of times an event happens divided by the number of trials. As trials add up, the relative frequency often settles near a value. Use a long run to predict the share of future trials with that event.

WORKED EXAMPLE

A spinner simulation records stars. Use the longest run to predict the approximate relative frequency of stars.

SPINNER SIMULATION

Spins	Stars
50	21
100	46
200	94

1. Use the longest run: 94 stars in 200 spins.
2. Divide: 94/200 = 47/100.
3. Convert: 47/100 = 47%.

Answer: About 47%.

PRACTICE 4 problems

1 A simulation shows 24 wins in 60 tries. Predict the approximate relative frequency of a win as a fraction.

ANSWER _____

2 Blue appears 4 times in the first 20 simulated draws and 32 times in 80 draws total. Use the longer run to predict its relative frequency as a fraction.

ANSWER _____

3 A simulation shows 30 hits in 120 tries. About how many hits would you predict in the next 40 tries?

ANSWER _____

4 An event occurs 54 times in 90 trials. Predict its approximate relative frequency as a percent.

ANSWER _____

APPLY IT Show your work

1 A game simulates opening bonus boxes. Use the longest run to predict the approximate relative frequency of a rare skin. About how many of the next 50 boxes might have one?

BONUS BOX SIMULATION

Boxes opened	Rare skins
25	7
75	24
150	48

ANSWER _____

2 A student simulates 240 cafeteria snack picks. Fruit cups appear 66 times. About how many fruit cups would appear in the next 80 picks?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two simulations of a game's prize wheel show 12 wins in 30 spins and 114 wins in 300 spins. Which result is better for predicting the long-run relative frequency of a win? Give the prediction and explain.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A simulation shows 24 wins in 60 tries. Predict the approximate relative frequency of a win as a fraction.	**2/5**
2	Blue appears 4 times in the first 20 simulated draws and 32 times in 80 draws total. Use the longer run to predict its relative frequency as a fraction.	**2/5**
3	A simulation shows 30 hits in 120 tries. About how many hits would you predict in the next 40 tries?	**About 10 hits.**
4	An event occurs 54 times in 90 trials. Predict its approximate relative frequency as a percent.	**60%**

PART 2 · APPLY IT

1. **About 32%; about 16 rare skins.** The longest run gives 48/150 = 8/25 = 32%. For 50 more boxes, 50 × 8/25 = 16.
2. **About 22 fruit cups.** The relative frequency is 66/240 = 11/40. For 80 more picks, 80 × 11/40 = 22.

CHALLENGE

Use 114 wins in 300 spins. It gives 114/300 = 38%, and the longer run is more useful for predicting long-run relative frequency.

Accept equivalent fractions, decimals, or percentages unless the prompt requests a form. Counts based on relative frequency are predictions, not guaranteed outcomes.