

Chance Data Detectives

Use trial data to estimate chance and make predictions.

GRADE 7 • 7.SP.C.6

CCSS.Math.Content.7.SP.C.6 "Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example..."

NAME _____

DATE _____

USE DATA TO PREDICT

Estimate a chance event by dividing the number of times it happened by the total number of trials. To predict how often it may happen in a new number of trials, multiply the estimated probability by the new total. Predictions describe what is likely, not what must happen exactly.

WORKED EXAMPLE

A spinner lands on violet 45 times in 72 spins. Use the data to predict how many violet results there may be in 96 spins.

1. Estimated probability of violet = $45/72$.
2. Simplify: $45/72 = 5/8$.
3. Predict: $5/8 \times 96 = 60$.

Answer: About 60 violet results.

PRACTICE 6 problems

- 1** A coin lands heads 27 times in 48 flips. What is the approximate probability of heads based on this data?

ANSWER _____

- 2** A player has a $1/3$ chance of earning a power-up in each round. About how many power-ups should the player expect in 54 rounds?

ANSWER _____

- 3** A prize wheel lands on a blue space 14 times in 28 spins. Based on this data, predict how many blue spaces it may land on in 64 spins.

ANSWER _____

- 4** In a sample of 44 mystery packs, 11 contain a rare sticker. What is the approximate probability that a mystery pack contains a rare sticker?

ANSWER _____

- 5** A video game bonus appears with probability $7/10$. About how many times should the bonus appear in 90 rounds?

ANSWER _____

- 6** A student hits a target 36 times in 120 throws. Based on this data, predict how many target hits there may be in 40 throws.

ANSWER _____

APPLY IT Show your work

- 1** The school robotics team tests a random prize feature in its app. A bonus turn appears 26 times in 104 tests. If the team runs 156 more tests under the same conditions, about how many bonus turns should it expect?

WORK SPACE

ANSWER _____

- 2** During basketball practice, Maya makes 17 free throws out of 34 attempts. If she takes 102 comparable free throws, about how many should she expect to make?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A music app is tested to see how often its shuffle feature plays a song from a student's favorite genre. In the first 16 songs, it plays that genre 4 times. In the next 40 songs, it plays that genre 15 times. Use all the data to find the approximate probability. Then predict how many favorite-genre songs may play in 112 songs. Explain why you should combine the data instead of averaging $\frac{4}{16}$ and $\frac{15}{40}$.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A coin lands heads 27 times in 48 flips. What is the approximate probability of heads based on this data?	9/16
2	A player has a $\frac{1}{3}$ chance of earning a power-up in each round. About how many power-ups should the player expect in 54 rounds?	About 18 power-ups.
3	A prize wheel lands on a blue space 14 times in 28 spins. Based on this data, predict how many blue spaces it may land on in 64 spins.	About 32 blue spaces.
4	In a sample of 44 mystery packs, 11 contain a rare sticker. What is the approximate probability that a mystery pack contains a rare sticker?	$\frac{1}{4}$
5	A video game bonus appears with probability $\frac{7}{10}$. About how many times should the bonus appear in 90 rounds?	About 63 times.
6	A student hits a target 36 times in 120 throws. Based on this data, predict how many target hits there may be in 40 throws.	About 12 target hits.

PART 2 • APPLY IT

1. **About 39 bonus turns.** The experimental probability is $\frac{26}{104} = \frac{1}{4}$. Multiply $\frac{1}{4}$ by 156 to get 39.
2. **About 51 free throws.** Maya's experimental probability is $\frac{17}{34} = \frac{1}{2}$. Multiply $\frac{1}{2}$ by 102 to get 51.

CHALLENGE

Approximate probability: $\frac{19}{56}$. Prediction: about 38 favorite-genre songs. Combine the results because the two tests have different numbers of songs, so each result should be counted by its number of trials.

Accept equivalent fractions for probability answers, including unsimplified forms. Accept predicted counts stated with "about" or "approximately," since these are long-run predictions.