

Chance Data Detectives

Use trial results to build probability models.

GRADE 7 • 7.SP.C.7b

CCSS.Math.Content.7.SP.C.7b "Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will..."

NAME _____

DATE _____

BUILD FROM DATA

Estimate a probability by dividing the number of times an outcome happens by the total number of trials. Use the observed frequencies to decide whether outcomes seem equally likely.

WORKED EXAMPLE

A spinner lands on red 11 times in 23 spins. Estimate $P(\text{red})$.

1. Red occurred 11 times.
2. There were 23 total spins.
3. $P(\text{red})$ is about $11/23$.

Answer: 11/23

PRACTICE 5 problems

- 1** PRACTICE 1. A spinner lands on moon 9 times in 24 spins. Estimate $P(\text{moon})$.

ANSWER _____

- 2** PRACTICE 2. A token lands red 6 times, blue 12 times, and green 12 times. Build a probability model.

ANSWER _____

- 3** PRACTICE 3. A spinner lands on A 3 times, B 15 times, C 9 times, and D 9 times. Do the outcomes appear equally likely?

ANSWER _____

- 4** PRACTICE 4. A tossed cup lands open-end down 15 times and open-end up 5 times. Estimate $P(\text{down})$.

ANSWER _____

- 5** PRACTICE 5. A random selector shows sun 8 times, cloud 10 times, rain 6 times, and snow 16 times. Estimate $P(\text{not snow})$.

ANSWER _____

APPLY IT Show your work

- 1** APPLY 1. A game app gives a chance reward. In 60 openings, it shows a badge 27 times, an avatar frame 21 times, and coins 12 times. Build a model. Which reward is most likely next?

WORK SPACE

ANSWER _____

- 2** APPLY 2. A podcast sound button is pressed 45 times. It plays a chime 18 times, a drum 15 times, and a clap 12 times. Estimate $P(\text{chime or clap})$.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

CHALLENGE. A game tester runs 70 trials. Spark appears 14 times, wave appears 21 times, and bolt appears x times. Find x , build a probability model, and predict how many bolts would appear in 70 more trials. Do the outcomes appear equally likely?

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	PRACTICE 1. A spinner lands on moon 9 times in 24 spins. Estimate $P(\text{moon})$.	$3/8$
2	PRACTICE 2. A token lands red 6 times, blue 12 times, and green 12 times. Build a probability model.	$P(\text{red}) = 1/5, P(\text{blue}) = 2/5, P(\text{green}) = 2/5$
3	PRACTICE 3. A spinner lands on A 3 times, B 15 times, C 9 times, and D 9 times. Do the outcomes appear equally likely?	No
4	PRACTICE 4. A tossed cup lands open-end down 15 times and open-end up 5 times. Estimate $P(\text{down})$.	$3/4$
5	PRACTICE 5. A random selector shows sun 8 times, cloud 10 times, rain 6 times, and snow 16 times. Estimate $P(\text{not snow})$.	$3/5$

PART 2 • APPLY IT

- $P(\text{badge}) = 9/20, P(\text{frame}) = 7/20, P(\text{coins}) = 1/5$; badge** Divide each reward count by 60. The badge has the greatest observed probability.
- $2/3$** Chime or clap occurred $18 + 12 = 30$ times. Use $30/45$, which simplifies to $2/3$.

CHALLENGE

$x = 35; P(\text{spark}) = 1/5, P(\text{wave}) = 3/10, P(\text{bolt}) = 1/2$; about 35 bolts; no

Accept equivalent fractions for all probability estimates. For equal-likelihood questions, accept a clear no supported by unequal observed frequencies.