LESSON MAKER PRO

Chance Lab

Model simple and compound events.

GRADE 7 · TEKS 7.6.B

7.6.B "select and use different simulations to represent simple and compound events with and without technology;"

NAME _____ DATE _____

MATCH THE CHANCE

Choose a simulation with the same equally likely outcomes as the event. For a compound event, simulate each part, then use target results divided by total trials to estimate probability.

WORKED EXAMPLE

An app has 9 equal icons, 2 suns and 7 clouds. Use digits 1-9, with 1-2 = sun. The digits are 8, 1, 5, 9, 2, 6, 4, 7, 3. Estimate P(sun).

1. Let 1 and 2 represent sun.
2. There are 9 simulated trials.
3. Sun appears 2 times.
4. Estimate = 2/9.

Answer: 2/9

PRACTICE 5 problems

1 Which pencil-and-paper simulation models one fair coin flip? A. Use odd/even random digits. B. Roll a die and call 1 heads. C. Choose A, B, or C.

ANSWER _____

2 Which simulation models rolling a fair die twice? A. Roll a die twice. B. Flip one coin. C. Choose one random digit.

ANSWER _____

3 Digits 0-9 simulate a spinner with equal red and blue halves. Red occurs in 3 of 8 trials. Estimate P(red).

ANSWER _____

4 Two coin flips simulate a compound event. In 12 trials, HH occurs 4 times. Estimate P(HH).

ANSWER _____

5 A random-number app gives integers 1-8. How should you simulate rolling two 8-sided dice?

ANSWER _____

APPLY IT Show your work

1 A game has 3 equal mystery-box prizes: a sticker, a keychain, and a rare skin. Jada uses a random-number app set to 1-3 for 15 trials. The rare skin appears 6 times. Estimate P(rare skin).

WORK SPACE

ANSWER _____

2 A basketball app gives a bonus animation only when two fair coin flips are both heads. In 20 simulated pairs, HH appears 7 times. Estimate P(bonus animation).

WORK SPACE

ANSWER _____

3 Actually simulate the basketball bonus event with a teacher-supplied fair coin. Flip it twice per trial for 12 trials. Record each pair in the table (two trials per row). Count first-flip heads and HH pairs. Estimate P(first flip heads) and P(bonus) from your results. Compare with 1/2 and 1/4, and explain why 12 trials need not match these theoretical probabilities.

OUR COIN SIMULATION · RECORD H OR T

Trials	First pair	Second pair
1, 2		
3, 4		
5, 6		
7, 8		
9, 10		
11, 12		

ANSWER _____

CHALLENGE One step up

A prize wheel has 2 green sections, 1 yellow section, and 1 blue section. You want to simulate green, then blue, with replacement. Describe a valid technology simulation and give the theoretical probability.

WORK SPACE AND ANSWER

ANSWER KEY # Chance Lab

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Which pencil-and-paper simulation models one fair coin flip? A. Use odd/even random digits. B. Roll a die and call 1 heads. C. Choose A, B, or C.	**A. Use odd/even random digits.**
2	Which simulation models rolling a fair die twice? A. Roll a die twice. B. Flip one coin. C. Choose one random digit.	**A. Roll a die twice.**
3	Digits 0-9 simulate a spinner with equal red and blue halves. Red occurs in 3 of 8 trials. Estimate P(red).	**3/8**
4	Two coin flips simulate a compound event. In 12 trials, HH occurs 4 times. Estimate P(HH).	**1/3**
5	A random-number app gives integers 1-8. How should you simulate rolling two 8-sided dice?	**Generate two numbers from 1-8 for each trial.**

PART 2 · APPLY IT

1. **2/5** Assign one number to each prize. Use 6/15, which simplifies to 2/5.
2. **7/20** Each trial needs two coin flips. Divide 7 bonus results by 20 total trials.
3. **Results vary. P(first heads) estimate = first-flip heads ÷ 12; P(bonus) estimate = HH pairs ÷ 12. Theoretical probabilities are 1/2 and 1/4.** Teacher supplies a fair coin and shows independent flips before learner use. Verify 12 actually recorded ordered pairs and both counts/fractions. HH, HT, TH and TT are the four equally likely pairs. Random variation is expected; do not require exactly six first-heads or three HH results. Preserve unusual but correctly recorded outcomes.

CHALLENGE

Use a random-number app set to 1-4 twice per trial: 1-2 = green, 3 = yellow, 4 = blue. P(green then blue) = 1/8.

Accept any fair equivalent mapping for the simulation choices. Accept equivalent fractions, such as 6/15 for 2/5.