LESSON MAKER PRO

Chance Check

Use models and data to predict what may happen.

GRADE 7 · 7.DSP.C.14

7.DSP.C.14 "Define and develop a probability model, including models that may or may not be uniform, where uniform models assign equal probability to all outcomes and non-uniform models involve events that are not equally likely. a..."

NAME _____ DATE _____

MODEL, THEN COMPARE

For equally likely outcomes, divide favorable outcomes by all possible outcomes. When outcomes may not be equally likely, use collected counts to estimate probability. Multiply the probability by the number of future trials to predict a count, then compare your prediction with what happens.

WORKED EXAMPLE

A bag is sampled with replacement. Use the results to predict how many green tokens will appear in 64 draws.

SAMPLE RESULTS

Token	Draws
Green	7
White	9

1. Total draws: 7 + 9 = 16.
2. Estimated P(green) = 7/16.
3. Predicted green draws: 64 × 7/16 = 28.

Answer: 28 green draws

PRACTICE 4 problems

1 A deck has 4 equally likely designs. One is a robot. In 20 draws with replacement, how many robots does the model predict?

ANSWER _____

2 In 18 draws with replacement, a bag gave 6 purple tokens and 12 orange tokens. Estimate P(purple).

ANSWER _____

3 A model gives a 1/4 chance of winning each game. In 24 games, there were 11 wins. How many more wins occurred than predicted?

ANSWER _____

4 In 30 draws, a blue token appeared 12 times. Give the observed fraction of blue draws. Does it match a model with P(blue) = 1/2 exactly?

ANSWER _____

APPLY IT Show your work

1 A video feed showed these clips in 24 recent plays. If the pattern continues, how many edits would you predict in 48 plays? The feed showed 19 edits instead. How far off was the prediction?

RECENT PLAYS

Clip	Plays
Edit	11
Meme	13

ANSWER _____

2 A game chooses from 10 equally likely avatar skins. Two have capes. In 50 matches, capes appeared 14 times. How many were predicted, how many more appeared, and why might the counts differ?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A game says prizes A and B are equally likely. In 36 plays, A appeared 24 times. Predict A in the next 60 plays using the game's model and using the observed fraction. Explain why the predictions differ and whether the data prove the game's claim is wrong.

WORK SPACE AND ANSWER

ANSWER KEY

Chance Check

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A deck has 4 equally likely designs. One is a robot. In 20 draws with replacement, how many robots does the model predict?	**5 robots**
2	In 18 draws with replacement, a bag gave 6 purple tokens and 12 orange tokens. Estimate P(purple).	**1/3**
3	A model gives a 1/4 chance of winning each game. In 24 games, there were 11 wins. How many more wins occurred than predicted?	**5 more wins**
4	In 30 draws, a blue token appeared 12 times. Give the observed fraction of blue draws. Does it match a model with P(blue) = 1/2 exactly?	**12/30 = 2/5; no**

PART 2 · APPLY IT

1. **22 edits predicted; 3 fewer edits appeared** Use 11/24 as the estimated probability of an edit: 48 × 11/24 = 22. The observed count was 22 − 19 = 3 lower.
2. **10 predicted; 4 more appeared. Results can vary by chance.** The model predicts 50 × 2/10 = 10 capes, which is 4 fewer than observed. Chance variation can cause the difference.

CHALLENGE

The game's model predicts 60 × 1/2 = 30 A prizes. The observed fraction is 24/36 = 2/3, so the data-based model predicts 60 × 2/3 = 40. They differ because the observed fraction is greater than 1/2; the data do not prove the claim is wrong because results can vary by chance.

Accept equivalent fractions and clear descriptions of chance variation. For the challenge, students should not treat a difference in observed counts as proof that the game's model is false.