Experimental Probability

Explore ideas and representations

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Experimental probability is the observed event count divided by the total trials. For 11 hits in 25 trials, the observed rate is $11/25$. Multiply the rate by the new trial count to predict under similar conditions. The result is not guaranteed.

Worked example

A spinner lands red 12 times in 30 trials. Estimate red results in 160 similar trials.

1. Observed rate $12/30 = 2/5$.
2. The projected red count is $160(2/5) = 64$.
3. It is an estimate from past trials; a new run need not produce exactly 64.
Answer: About 64 red results.

Practice Problems

Show your thinking.

1. A game wins 18 times in 40 trials. Find experimental win probability and loss probability.

result	count
wins	18
total	40
losses	?

2. A spinner has 27 red results in 60 spins. Predict red results in 200 spins from the data.

3. A fair-coin model gives $1/2$ for heads. In a test, 16 of 50 tosses were heads. Is the observed rate above or below $1/2$, and by how much?

4. A game records 35 wins in 70 plays. How many losses occurred, and what fraction were losses?

result	count
wins	35
total	70
losses	?

5. Experiment A has 22 wins in 80 trials; B has 26 wins in 80 trials. Find both observed rates and their exact gap.

6. An experimental rate is $\frac{2}{5}$ from 90 trials. Recover the successful count and check.

7. Two game trials record 7 wins in 20 plays and 9 in 30. Pool the data and find experimental win probability.

8. An observed rate is $3/8$ from 64 trials. Recover the successful count and failure count.

Answer Key

1. Success $\frac{9}{20}$; failures 22, rate $\frac{11}{20}$.
2. About 90 successes.
3. Observed heads rate $16/50 = \frac{8}{25}$; $\frac{9}{50}$ below $1/2$.
4. Success $\frac{1}{2}$; failures 35, rate $\frac{1}{2}$.
5. A $\frac{11}{40}$, B $\frac{13}{40}$; B is higher, gap $\frac{1}{20}$.
6. 36 successes.
7. Pooled rate $8/25$.
8. 24 successes and 40 failures.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Observed success rate $= 18/40 = \frac{9}{20}$.
2. Failures $= 40 - 18 = 22$, fraction $\frac{11}{20}$.
3. Check: $\frac{9}{20} + \frac{11}{20} = 1$, since all observed outcomes are successes or failures.

Problem 2

1. Observed success rate $= 27/60 = \frac{9}{20}$.
2. The model for 200 future trials gives $200(\frac{9}{20}) = 90$.
3. To the nearest whole trial, plan for about 90 successes. This is an estimate, not a promise.

Problem 3

1. Observed heads rate $= 16/50 = \frac{8}{25}$.
2. Write the theoretical rate as $1/2 = 25/50$. The observed numerator 16 is smaller than 25.
3. Subtract: $25/50 - 16/50 = \frac{9}{50}$. The observed rate is $\frac{9}{50}$ below $1/2$.

Problem 4

1. Observed success rate $= 35/70 = \frac{1}{2}$.
2. Failures $= 70 - 35 = 35$, fraction $\frac{1}{2}$.
3. Check: $\frac{1}{2} + \frac{1}{2} = 1$, since all observed outcomes are successes or failures.

Problem 5

1. Observed win rates: A $22/80 = \frac{11}{40}$; B $26/80 = \frac{13}{40}$.
2. With denominator 40, A is $11/40$ and B is $13/40$, so B is higher.
3. Subtract the smaller rate from the larger: $13/40 - 11/40 = 2/40 = \frac{1}{20}$.

Problem 6

1. The unknown count s satisfies $s/90 = \frac{2}{5}$.
2. Multiply by the total: $s = 90(\frac{2}{5}) = 36$.
3. Check: $36/90 = \frac{2}{5}$.

Problem 7

1. Wins $7 + 9 = 16$, plays $20 + 30 = 50$.
2. Pooled probability $16/50 = 8/25$.
3. In the combined data, 16 wins and $50 - 16 = 34$ losses account for all 50 plays.

Problem 8

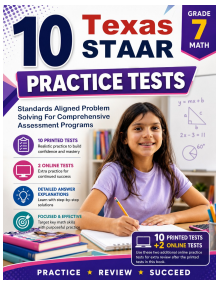
1. The 64 trials form $64/8 = 8$ groups of 8 in the ratio model.
2. Successes are $8(3) = 24$; the other $64 - 24 = 40$ trials were failures.
3. Check $24/64 = 3/8$. The numerator 3 is per group of 8, not the total success count.

TESTINAR

Keep Building Grade 7 Math Skills

Choose the practice book matched to your state assessment and turn worksheet practice into a complete test-prep plan.

All Grade 7 books



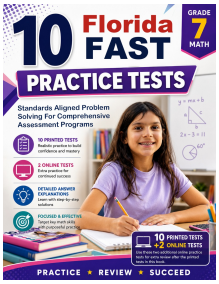
TEXAS STAAR

10 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 10 printable practice tests.

Printable eBook • Instant PDF access

View eBook



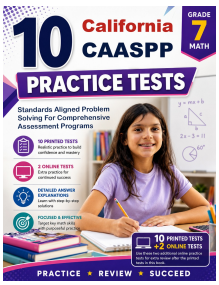
FLORIDA FAST

10 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 10 printable practice tests.

Printable eBook • Instant PDF access

View eBook



CALIFORNIA CAASPP

10 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 10 printable practice tests.

Printable eBook • Instant PDF access

View eBook

Need a different state?
Testinar has Grade 7 math practice books for state assessments across the country.

TESTINAR.COM/GRADES/7