

Creative Test Plans

See how scientists use ideas to design fair experiments.

SC.4.N.1.8 "Recognize that science involves creativity in designing experiments."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each creative choice Maya made to design or improve her experiment. Circle each detail she kept the same to make her comparison fair.

Maya's Paper Bridges

- ① Maya wanted to learn which paper bridge design could hold the most pennies. She did not begin with one obvious plan. She sketched three ideas: a flat strip, a folded fan, and a tube. All three bridges used one sheet of the same paper and rested across the same two books. Her creative ideas gave her several designs to compare.
- ② For each design, Maya added pennies one at a time until the bridge touched the table. She recorded the number of pennies in a notebook. To make the test fair, she used the same kind of paper, the same gap between the books, and the same pennies each time. She tested every design three times, because one trial might be unusual.
- ③ The folded fan held the most pennies during the first tests. Maya then made a new version with smaller folds. This revision was another creative choice, not a guess about the final answer. She tested the new version the same way as the others. Scientists use imagination to plan comparisons, solve problems, and improve an experiment.

2

ANSWER WITH EVIDENCE

Use the passage

1

What three paper bridge designs did Maya sketch?

2

Name two things Maya kept the same. Why did keeping them the same matter?

3

Why did Maya test each bridge design three times?

4

How did Maya creatively improve the folded fan design after her first tests?

3

YOUR TURN

Your own words

Choose a question about an object you can test, such as which kind of wrap keeps a cup of water warmest. Plan three different designs to compare. In each row, name a design, write something you will keep the same for every test, and tell what you will measure.

DESIGN IDEA	KEEP THE SAME	MEASURE

PART 1 • READ AND MARK

Underline each creative choice Maya made to design or improve her experiment. Circle each detail she kept the same to make her comparison fair. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What three paper bridge designs did Maya sketch?	A flat strip, a folded fan, and a tube.
2	Name two things Maya kept the same. Why did keeping them the same matter?	She kept the kind of paper, the gap between the books, and the pennies the same. Keeping these things the same made the comparison fair.
3	Why did Maya test each bridge design three times?	One trial might be unusual, so three trials give a better comparison.
4	How did Maya creatively improve the folded fan design after her first tests?	She made a new folded fan with smaller folds and tested the new version the same way.

PART 3 • YOUR TURN (SAMPLE ANSWER)

DESIGN IDEA	KEEP THE SAME	MEASURE
Cup with one cloth layer	Same cup, water amount, starting temperature, and test time	Water temperature after 20 minutes
Cup with two cloth layers	Same cup, water amount, starting temperature, and test time	Water temperature after 20 minutes
Cup wrapped in crumpled paper	Same cup, water amount, starting temperature, and test time	Water temperature after 20 minutes

Accept the listed passage details or equivalent wording for Parts 1 and 2. For Your Turn, accept any safe, testable plan with three different designs, a reasonable controlled condition, and one measurable result.