



# Engineering Design Challenges

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Grade: Grade 4

## Part A: Multiple Choice

Circle the best answer for each question.

1. Jay's catapult shoots 20 cm. He wants more distance. Which change fits the goal first?

- A) Pull the spoon back farther before release.
- B) Use a much heavier marble than before.
- C) Set the catapult on softer carpet flooring.
- D) Block the spoon so it moves less now.

2. Lily's boat sinks under 10 pennies. She raises the sides. Best fair test next?

- A) Try heavier coins to push the limit higher.
- B) Use the same pennies and same tub of water.
- C) Move the boat to a faster, deeper river nearby.
- D) Test it on dry land with no water around.

3. Noah's parachute drops too fast. Which change fits his goal of slower drops?

- A) Use a smaller, much tighter canopy.
- B) Add many heavy washers under the chute.
- C) Make the canopy wider with more air drag.
- D) Cut several large holes through the middle.

4. Eva's straw rocket flies crooked. Which improvement most likely fixes the flight path?

- A) Use much shorter and softer straws each time.
- B) Push less air through the launcher straw.
- C) Launch it from a higher, tilted starting spot.
- D) Add small balanced fins near the rocket base.

## Part B: Fill in the Blank

Write the correct answer on each line.

1. Using test data to guide changes is called \_\_\_\_\_-based design.
2. Two tests with one variable changed produce a \_\_\_\_\_ comparison.
3. An idea that fails a test still gives the team useful \_\_\_\_\_.
4. Each trip through the design loop is called one \_\_\_\_\_.
5. A design that meets every criterion within all limits is the \_\_\_\_\_ solution.

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**Part B: Fill in the Blank**

*Write the correct answer on each line.*

1. Using test data to guide changes is called evidence -based design.
2. Two tests with one variable changed produce a fair comparison.
3. An idea that fails a test still gives the team useful information .
4. Each trip through the design loop is called one iteration .
5. A design that meets every criterion within all limits is the best solution.