Compare Engineering Solutions

Grade 3 Science Worksheet - Challenge Me

Name _____ Date _____

Circle the answer.

1. A kite must stay up at least 5 minutes and cost less than $5. Kite A stayed up 6 minutes and costs $4. Kite B stayed up 7 minutes and costs $6. Which kites meet all the rules?
   Kite A only both kites Kite B only neither kite

2. Which order shows how engineers usually compare and improve solutions?
   build once, skip testing, keep the first design
   test each design, compare results to the goal, redesign if needed
   compare to the goal, redesign, then test
   redesign, test each design, then compare to the goal

3. Design A meets every criterion but breaks the material limit. Design B meets the limit but misses one criterion. What should engineers do next?
   choose B and ignore the missing goal
   improve the designs so one meets both
   choose A and ignore the limit
   build both again without changes

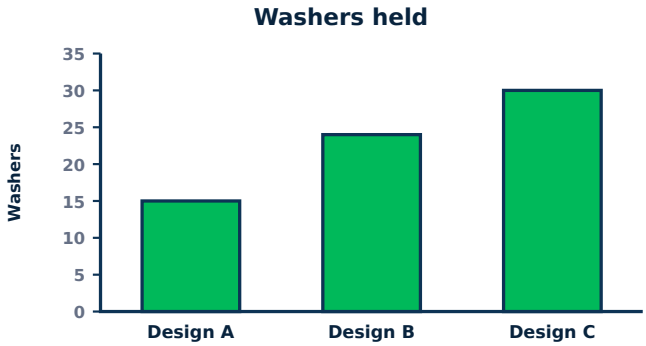
4. A wind-powered car goes farther with bigger sails but tips over more easily. What tradeoff does this show?
   sail size versus cost speed versus wheel size speed versus distance
   sail size versus stability

5. Two solutions both meet the criteria and constraints. What is a reasonable next step before choosing one?
   pick the one built first
   choose one without more testing
   assume they perform the same
   test both again to see which works more reliably

6. A class has three ramp designs and time to test only two. Which two should they test first?
   the two with the most parts
   the two made of the same material
   the two finished last
   the two most likely to meet the distance goal

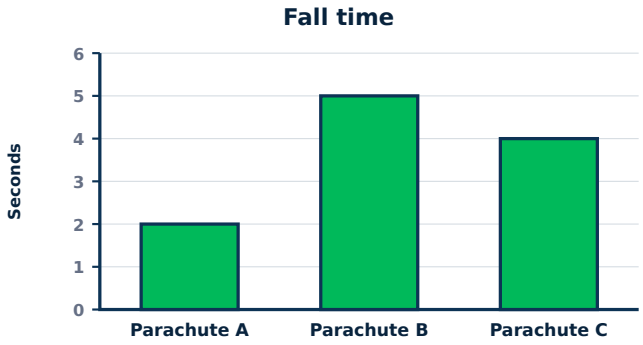
7. Two gliders are launched the same way. Glider A flies straight across the room. Glider B spins and drops. The goal is to fly straight and far. Which meets the goal?
   both gliders Glider B neither glider Glider A

8. The goal is a bridge that holds at least 20 washers using as little paper as possible. Design B uses 4 sheets and Design C uses 8 sheets. Use the graph. Which is the best choice?



Designs A and C Design C Design A Design B

9. The goal is a parachute that takes at least 4 seconds to fall. Use the graph. Which parachutes meet the goal?



all three A and C B only B and C

10. Design A held 10, 12 and 11 washers in three tests. Design B held 15, 4 and 14. The goal is a bridge that holds at least 10 washers every time. Which is better?

Design B, because it held the most once
both, because each held 10 once
Design B, because its total is higher
Design A, because every test met the goal

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Answer Key - Grade 3 Science Worksheet - Challenge Me

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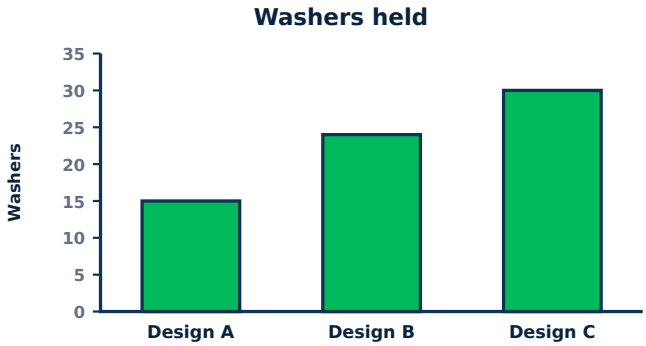
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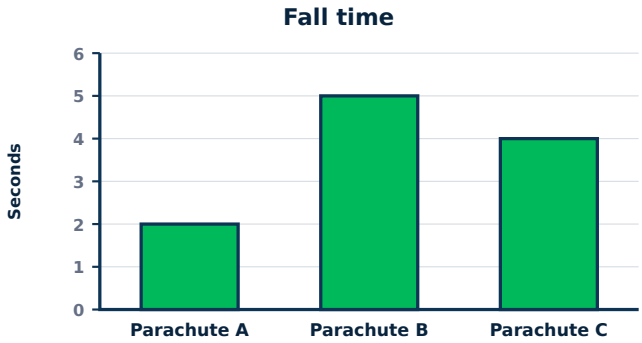
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