Define Engineering Problems

Grade 3 Science Worksheet - Challenge Me

Name _____ Date _____

Circle the answer.

1. A bike rack must hold 12 bikes and fit a space 3 meters long. A student says it should look cool. Is looking cool a criterion of this problem?
   - no, because it is a constraint
   - yes, because it is a limit
   - yes, every idea is a criterion
   - no, it is not one of the stated needs

2. A class must keep an ice cube from melting for 30 minutes using only paper, foil and tape. Which is a constraint?
   - use only paper, foil and tape
   - keep the ice cube for 30 minutes
   - fit the cube inside the holder
   - keep the ice cube from dripping

3. A bird feeder must let small birds eat but keep squirrels out. Which question best defines the problem?
   - How can small birds reach the seeds while squirrels cannot?
   - How can squirrels reach the seeds faster?
   - How can a feeder be built quickly?
   - How can a feeder hold the most seeds?

4. Why should engineers talk with the people who will use a design before building it?
   - to skip testing later
   - to choose the materials for them
   - to learn what needs the design must meet
   - to make the design cost more

5. A bridge holds 25 washers. The goal was 20 washers, but the team used 3 more sheets of paper than allowed. Does it solve the problem?
   - no, because it breaks the paper limit
   - yes, because it holds more than 20 washers
   - yes, because extra paper is fine if it works
   - no, because it holds too many washers

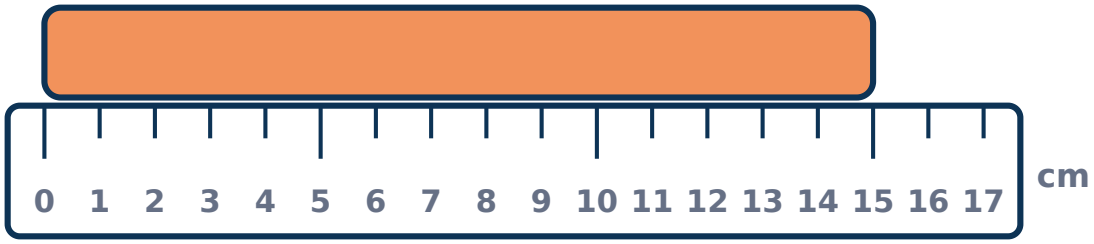
6. A shade cover must shade a 2-meter bench and cost less than $20. Cover A shades 2 meters and costs $15. Cover B shades 3 meters and costs $25. Which fits the problem?
   - both covers
   - Cover A
   - Cover B
   - neither cover

7. Which is the best order for starting a design project?
   - brainstorm, state the problem, then list criteria
   - state the problem, list criteria and constraints, then brainstorm
   - build a model, state the problem, then test
   - list criteria, build, then state the problem

8. A greenhouse must keep plants above 40°F at night. On a 25°F night, the inside reads 45°F. Did it meet the goal?

no, because 45°F is below 40°F
yes, because it was cold outside
yes, because 45°F is above 40°F
no, because it was 25°F outside

9. A card bridge must span a gap of at least 18 cm. This bridge spans 15 cm. Does it meet the requirement?



no, because it uses too many cards
yes, because 15 cm is close enough
yes, because it uses only index cards
no, because 15 cm is shorter than the 18 cm goal

10. A doghouse must keep rain out and fit a yard 4 feet wide. Doghouse A is 3 feet wide and keeps rain out. Doghouse B keeps rain out but is 6 feet wide. Which solves the problem?

both doghouses Doghouse B only neither doghouse Doghouse A only

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Answer Key - Grade 3 Science Worksheet - Challenge Me

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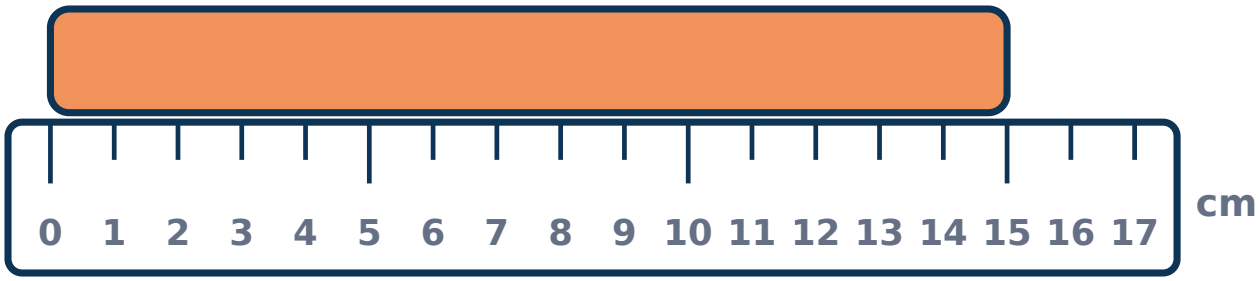
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