Define Engineering Problems

Grade 3 Science Worksheet - Challenge Me

Name _____ Date _____

Circle the answer.

1. A tower must be at least 30 cm tall and use no more than 20 straws. Tower A is 32 cm with 18 straws. Tower B is 35 cm with 20 straws. Which towers meet the rules?

   both towers Tower B only Tower A only neither tower

2. A boat must hold 10 pennies and use one sheet of foil. Boat A holds 12 pennies but uses two sheets. Boat B uses one sheet but holds 7 pennies. Which boats meet the rules?

   neither boat Boat A only both boats Boat B only

3. 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?

   yes, because it is a limit

   no, it is not one of the stated needs

   yes, every idea is a criterion

   no, because it is a constraint

4. 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

5. A bird feeder must let small birds eat but keep squirrels out. Which question best defines the problem?

   How can a feeder be built quickly?

   How can a feeder hold the most seeds?

   How can squirrels reach the seeds faster?

   How can small birds reach the seeds while squirrels cannot?

6. Why should engineers talk with the people who will use a design before building it?

to skip testing later

to learn what needs the design must meet

to choose the materials for them

to make the design cost more

7. 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 extra paper is fine if it works

no, because it holds too many washers

yes, because it holds more than 20 washers

8. 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?

Cover A both covers neither cover Cover B

9. Which is the best order for starting a design project?

brainstorm, state the problem, then list criteria

build a model, state the problem, then test

state the problem, list criteria and constraints, then brainstorm

list criteria, build, then state the problem

10. 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 it was 25°F outside

yes, because it was cold outside

yes, because 45°F is above 40°F

no, because 45°F is below 40°F

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Answer Key - Grade 3 Science Worksheet - Challenge Me

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