

STRUCTURES and FORCES Unit Test

Student _____

Class _____


Natural and Human-made Structures


1. A student who was studying for a rest remembered the different models the teacher used in class to identify the different kinds of structures. When the teacher made a tent-like position with the hands, the student remembered it represented a ...
 - A. **mass**
 - B. **shell**
 - C. **frame**
 - D. **solid**

2. A frame structure like your skeleton is made of very strong materials so they can support the ...
 - A. **ligaments**
 - B. **cartilage**
 - C. **joints**
 - D. **organs**

3. Spider webs are examples of structures that can hold up to 4000 times the weight of the spider that made it. The spider web is a ...
 - A. **solid frame structure**
 - B. **solid shell structure**
 - C. **natural shell structure**
 - D. **natural frame structure**

4. All of the following structures can be classified as manufactured, EXCEPT a ...
 - A. **jigsaw puzzle**
 - B. **spoon**
 - C. **feather**
 - D. **fishing net**

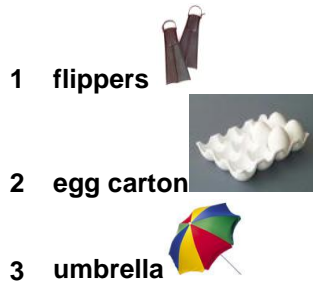
5.  *Inukshuit* is a unique symbol of Inuit culture, always pointing the way home. To anyone who encounters these manufactured structures (which come in many different forms and shapes) the greeting they convey is one of joy and happiness. Their purpose is to ...
 - A. **show danger**
 - B. **guide travelers**
 - C. **reward hunters**
 - D. **identify hazards**

6.  These 5 glass-pyramids of the **Conservatory** house different types of plant cultures, including; tropical, arid and temperate. It is more than just a garden though, because it hosts many premier floral shows, educational programs for school children, horticultural courses for adults and continues as a very popular site for weddings, banquets and business activities.

Because these structures are used for a variety of reasons, they have multiple

 - A. **designs**
 - B. **functions**
 - C. **shapes**
 - D. **forms**

7. Roof types are designed for cover and also to serve a useful purpose in the environment in which they can be found. A very steep roof design in a mountainous area is designed to prevent ...
- heavy rains
 - snow build-up
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 - wind damage
8. A rancher invented barbed wire to keep his livestock from wandering off. His idea came from a natural structure, a ...
- cactus
 - tumbleweed
 - prickly pear
 - thorny bush
9. When choosing the most suitable materials to build a structure, architects, engineers and designers should consider all of the following before making their final choice ...
- cost, appearance, environmental impact, energy efficiency
 - cost, color, life expectancy, impact strength
 - environmental appearance, type of symmetry, type of joints needed, cost effectiveness
 - flexibility, impact strength, energy efficiency, color
10. Each manufactured structure can be paired with a natural structure it is based on.



Only one of the pairings below is correct. Which one is it?

- 6 - 1
 - 3 - 6
 - 6 - 5
 - 2 - 6
11. One important criteria of good design - that is usually not written down in the specifications - is that the structure ...
- has a margin of safety
 - is esthetically pleasing
 - is cost effective
 - has a solid foundation
12. Sun-baked '**Adobe**' brick houses are usually found in countries where the climate is ...
- Wet and cool
 - Hot and dry
 - Temperate
 - Damp and cold



13. **Sod houses** were common in the Midwest and were used by ...
- engineers
 - settlers
 - businessmen
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14. Both of these structures are houses for people in very specific environments. One advantage of structures such as these is that they ...



Igloo



tent

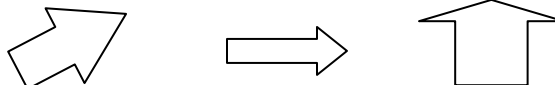
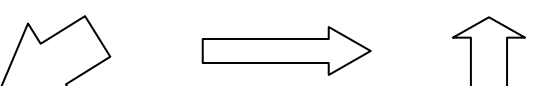
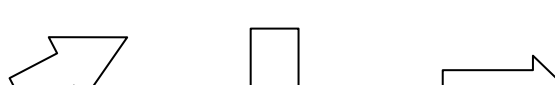
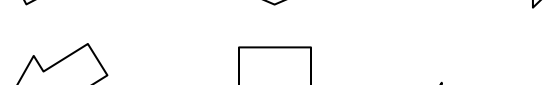
- A. are portable
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External and Internal Forces Act on Structures

15. The actual effect of a force depends on three things: the magnitude, or size of the force; the direction of the force; and ...

- A. how the force is applied
- B. where the force is applied
- C. why the force is applied
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16. A large force is applied to a freezer to move it up a ramp to the second floor, where a smaller force is used to push it to the window, and a very large force is needed to lift it up, to put it off balance, so it falls out the window and is demolished on the sidewalk below.

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17. The standard unit of measuring force is named after a famous scientist, who was the first to describe the '*law of gravitation*', getting the idea for the law as he sat under an apple tree. This unit of measuring force is similar to the amount of force needed to hold an apple in your hand and is called a ...

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18. Identify which structure would have the greatest stability, because of its centre of gravity.

- A. High centre of gravity and a narrow base
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24. Performance requirements are the guiding principles that engineers use to design structures. Maximum weight that the structure can support is expressed as ...
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27. The 7 wonders of the Ancient World took many years to complete, but they lasted a very long time. Why do you think that the Statue of Zeus at Olympia lasted so long?
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Structural Strength and Stability

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 - brittleness**
 - tensile strength**
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47. Technological advancements have led to new composite materials being developed. One such material is used in such diverse products as tires, fiber optic cables, and sporting goods. This composite material is known as ...
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48. Hollow triangle tubes are used as the traditional shapes for a bicycle. This is because they provide the best ...
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49. All departments within the bicycle company, such as marketing can have access to the bicycle specifications because the company uses this for all its bike designing and manufacturing ...
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50. A radio that operates by turning a crank in the back provides enough power to last about 30 minutes. The radio operates on mechanical energy, with no need for batteries or electricity. It could become very popular because one of its best advantages is its ...
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2 egg carton 

3 umbrella 

4 honeycomb 

5 mushroom 

6 webbed feet 

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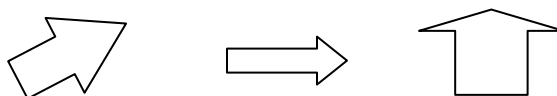
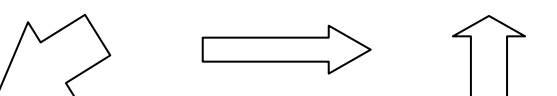
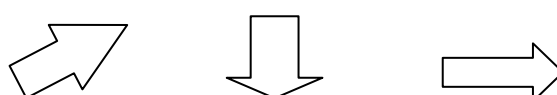
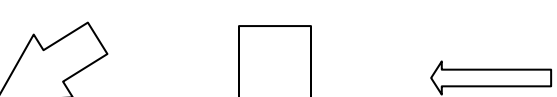
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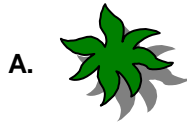
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