


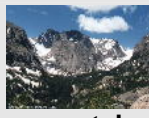


# Science 7 - Numerical Response Questions - Structures and Forces

Sample ...

1. Classify each structure

|  |   |
|--|---|
| 1<br><br><b>feather</b> | 2<br><br><b>bicycle</b>  |
| 3<br><br><b>dam</b>     | 4<br><br><b>mountain</b> |

|                 |       |                      |       |
|-----------------|-------|----------------------|-------|
| 4               | 1     | 3                    | 2     |
| Natural<br>Mass | Frame | Manufactured<br>Mass | Frame |

|   |   |   |   |
|---|---|---|---|
| 4 | 1 | 3 | 2 |
| . | . | . | . |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 |

2. Match the description with the type of **material** it represents.

- 1 made from more than one type of material
- 2 putting layers of materials together to make them stronger
- 3 interlocking to make the material stronger
- 4 melting and dissolving substances together

\_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_  
 yarn      drywall      aluminum foil      reinforced concrete

|   |   |   |   |
|---|---|---|---|
| . | . | . | . |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 |

3. Match the type of **rigid joint** with the example that illustrates it.

- 1 fastener
- 2 tie
- 3 interlocking shape
- 4 adhesive

\_\_\_\_\_ rivets  
 \_\_\_\_\_ clothing hem  
 \_\_\_\_\_ shoe lace  
 \_\_\_\_\_ epoxy resin

|   |   |   |   |
|---|---|---|---|
| . | . | . | . |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 |

4. **Gravitational Force** on the Earth is equal to approx. 10 Newtons for each kilogram of mass. How much force does 125 grams have?

**Show how you figured it out!**

|   |   |   |   |
|---|---|---|---|
| . | . | . | . |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 |

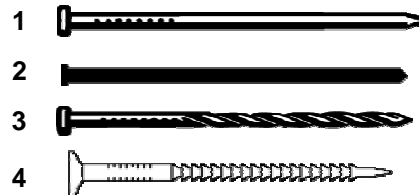
5. **Internal Forces** – are forces, which can be exerted on a structure from within. Match the type of internal force with its description.

- 1 tension
- 2 compression
- 3 shear
- 4 torsion

\_\_\_\_\_ squeezing together  
 \_\_\_\_\_ twisting and turning  
 \_\_\_\_\_ tearing or ripping  
 \_\_\_\_\_ pulling apart

|   |   |   |   |
|---|---|---|---|
| . | . | . | . |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 |

6. Different nails are used for different purposes. Put the following nail types in order of their **fastening ability**. Most friction to least friction



\_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_  
 most friction -----> least friction

|   |   |   |   |
|---|---|---|---|
| . | . | . | . |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 |