

Structures and Forces Study Guide

1. Define the word *structure*. (p.264)
2. Name and describe the three main structural forms. (p.266-267)
3. Define the word *function*. (p.269)
4. Define the word *aesthetics*. (p.274)
5. What three factors does force depend on? (p.281-282)
6. What unit do we use to measure force? (p.284)
7. What is mass and what unit do we use to measure it? (p.285)
8. Define the term *centre of gravity*. (p.286)
9. Define the term *symmetry*. (p.287)
10. What is a load? (p.288)
11. What is the difference between a *static* and *dynamic* load? (p.288-289)
12. How are internal and external forces different? (p.285, 296)
13. Name and describe three internal forces. (p.297)
14. Define *complementary forces*. (p.298)
15. What is the strongest structural shape? (p.301)
16. What is a beam? How are beams and cantilevers different? (p.302-303)
17. Explain three reasons why a house in the desert would be designed differently than a house in the rainforest. (p.276-277)
18. Draw a suspension bridge with a car driving across it. Label the load, and where the bridge would experience compression and tension.
19. Give three examples of human-made structures that were based on natural structures. (p.273)
20. Explain using the terms *structural stress*, *structural fatigue*, and *structural failure* the reason that a structure can stay standing for a long period of time and then suddenly collapse. (p.303)
21. List the defining characteristics of a *beam bridge*, *arch bridge*, *truss bridge* and *suspension bridge*. (p.290-291)
22. What are *performance requirements*? If you were designing a roller coaster, what are five performance requirements that you would be looking for? (p.294)
23. If a structure is built very tall, but is not symmetrical around the centre of gravity, what will happen and why?
24. What are two ways that you could change a structure to make it more stable?