

Name: _____

Bridge Building WebQuest

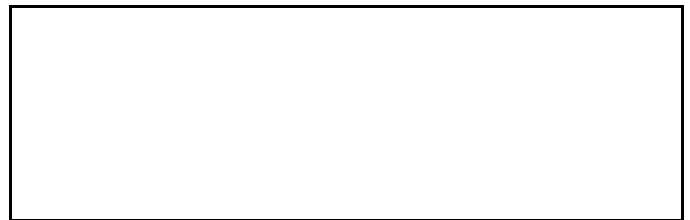
EACH STUDENT MUST HAND IN THEIR OWN WEBQUEST

How Stuff Works: Bridge - <http://science.howstuffworks.com/engineering/civil/bridge.htm>

1. Compression is:
2. Tension is:
3. Buckling is:
4. Snapping is:
5. To dissipate a force is to:
6. To transfer a force is to:

The Beam Bridge

7. Draw a picture of a beam bridge. Show where they have compression and tension forces.

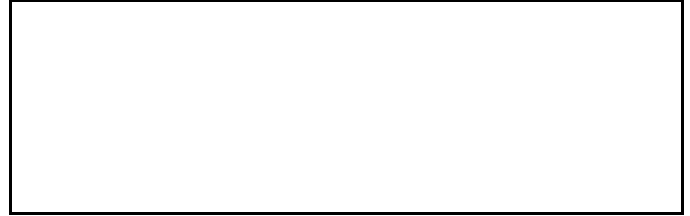


8. How does a truss help a bridge beam?
9. Why is a beam bridge limited in the distance it can span?

10. What shape is always found in a truss, regardless of the type?

The Arch Bridge

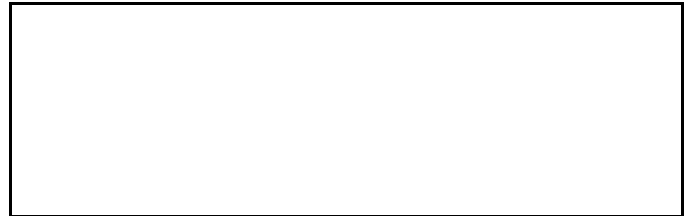
11. Draw a picture of an arch bridge. Show where they have compression and tension forces.



12. Why is an arch bridge limited in the distance it can span?

The Suspension Bridge

13. Draw a picture of a suspension bridge. Show where they have compression and tension forces.



14. How is a cable-stayed bridge different from the traditional suspension bridge?

Additional Bridge Forces

15. Torsion is:

16. Resonance is:

Delaware River Port Authority - <http://www.drpa.org/>

	Number of lanes	Width	Length	Structural steel weight
Benjamin Franklin				
Betsy Ross				
Walt Whitman				
Commodore Barry				

PBS: Forces Lab - <http://www.pbs.org/wgbh/buildingbig/lab/forces.html>

Forces

1. What is a real life example of “squeezing” or compression?
2. What is a real life example of “stretching” or tension?
3. What is a real life example of bending?
4. What is a real life example of “sliding” or shear?
5. What is a real life example of “twisting” or torsion?

Loads

6. How can a bridge be improved to hold more live loads?
7. How can a bridge be improved to survive soil erosion?

8. How can a bridge be improved to survive extreme temperature changes?

9. How can a bridge be improved to survive an earthquake?

10. How can a bridge be improved to survive strong winds?

11. How can a bridge be improved to survive vibrations?

Materials

What are the pros and cons for each of the following building materials?

	Pros	Cons
12. Wood		

13. Plastic

14. Aluminum

15. Brick

16. Concrete

17. Reinforced Concrete

18. Cast Iron

19. Steel

Shapes (Draw a picture if it helps)

20. What happens when you push the side of a rectangle?

21. How can you strengthen it?

22. What happens when you push down on an arch?
23. How can you strengthen it?
24. What happens when you push the side of a triangle?
25. Where is the strongest point of a triangle?

PBS: Build a Bridge - <http://www.pbs.org/wgbh/nova/bridge/build.html>

Complete Steps 1, 2, and 3.

Which of the follow bridges would be most appropriate for each location: arch bridge, beam bridge, suspension bridge, or cable-stayed bridge?

1. A 5,000-foot span across an ocean bay where huge ships come and go.
2. A 120-foot span across a freeway.
3. A 1,000-foot span across a river busy with barge traffic.
4. A 700-foot span across a deep canyon gorge.