

**PHYSICS PROJECT**  
**PBS BUILDING BIG: BRIDGES**

**Name:** \_\_\_\_\_

1. Bridge builders in ancient Rome were given the name *pontifect*, what is the meaning of this word?

2a. What geometric shape was most prevalent in stone bridge construction?

b. What was the key part in creating the force critical to maintaining stone bridges?

3a. Name three disadvantages of the use of stone in bridge construction:

b. Name four advantages of the use of cast iron in bridge construction:

4. With the invention of this “new” kind of iron, cast iron, bridges are no longer constructed but

5. Circle the correct name of the following forces:

Pressing force:

a. compression      b. tension

Stretching or pulling force:

a. compression      b. tension

**6.** What cause the failure of the “Dee” river bridge?

**7a.** Gustav Eiffel constructed a bridge using a new arrangement of beams to withstand strong winds. Name this kind of arrangement:

**b.** Circle the correct answer for the forces in Eiffel’s bridge:

1. compression on top and tension on bottom

2. compression on bottom and tension on top

**c.** What is the major drawback to this type of bridge arrangement?

**8.** What kind of bridge provided a solution for longer spans?

**9.** Underline the correct answer for the forces in these bridges:

1. compression on cables and tension on towers

2. compression on towers and tension on cables

**10.** Name the bridge built by the Roebling’s:

**11a.** What device was invented to dig-out the bottom of the river to secure the bridge towers?

**b.** What medical problem did the workers develop from this new bridge construction invention?

**12.** What were some of the challenges that the Golden Gate Bridge presented?

**13.** What is the objective of arranging the wire cables in bundles?

**14.** The Golden Gate and Tacoma Narrows Bridge moved up and down. What new design to the above type of bridges came about but severely limited the length of the bridge span?

**15.** What characteristic of the Golden Gate Bridge saved it in the earthquake of 1986?