

Boom Construction Activity – Construction Pre-/Post-Quiz – Answer Key

Note: Teachers should use judgment on student responses, as answers may vary. Responses that have concepts related to this Answer Key may be considered correct.

1. Why is it important to estimate the cost and how much material will be needed for a building project?

Most engineering projects are competitive among many firms; the owner (requestor) of the project may choose the firm that has the lowest estimated cost. A firm needs to know how much resources and money it will need to complete the project. Estimations also allow firms to compare perceived allocated resources to similar projects to see if they are accurate in their cost projections.

2. How are cost and material estimations used by engineers?

Estimates are used by engineers in order to bid on a contract in an attempt have the lowest price amongst competitors and “win” the bid.

3. What is an accuracy equation?

An accuracy equation is an equation that measures how close you are to the desired or actual value. Note: rewriting the WER or CER ratios from competition is an appropriate answer.

4. What is deflection?

Deflection is the amount a building or structure has moved from its original place. Students may also respond that it is “how much something has sagged,” which is correct as well.

5. Does a bridge have to collapse in order for a civil engineer to consider it “failed”?

No, a building may fail due to deflection reasons or it may be built incorrectly (curved, lopsided, etc.). It may also show signs of bending failure on some parts, which is considered failed.

6. What is shear failure?

Shear failure is when a beam gets crushed internally or gets cut in half due to too much load being applied to it. Not to be confused with bending failure, in which the beam actually bends and break due to bending. Students may talk about paper crushing, which is a correct response as well.