

## Engineering Design Process Pre/Post-Test **Answer Key**

Q1.

When following the steps of the engineering design process, in which order do the steps usually occur?

**A. clockwise** 

B. counter-clockwise 

C. in any order

D. both clockwise and counter-clockwise

**Suggested grading:**

**21 points maximum**

**( = 1 point per correct answer)**

Adapted from [engineering design quiz answers](http://engineeringdesignquizanswers.com), TeachEngineering.org.

Q2.

Rob and his team have been chosen to build a wind turbine at a local mountain. The turbine needs to generate electrical energy and withstand the harsh winter environment of the mountain. Rob and his team have done their research on the problem. What is the next step?

A. Create a prototype of the wind turbine.

**B. Develop possible solution(s) for the turbine.**

C. Test the wind turbine on the mountain.

D. Redesign a new solution for the turbine.

Q3.

The engineering design process is \_\_\_\_\_.

**A. an iterative process.**

B. a process that creates one prototype.

C. a quick process.

D. a process with a beginning and an end.

Q4.

Below are listed the eight steps of the engineering design process—not in the correct order! Fill in the blank boxes in the graphic on the next page with the letter of each step to show the usual order.

A. Test and evaluate the solution

B. Develop possible solution(s)

C. Identify the need or problem

D. Research the need or problem

E. Construct a prototype

F. Redesign

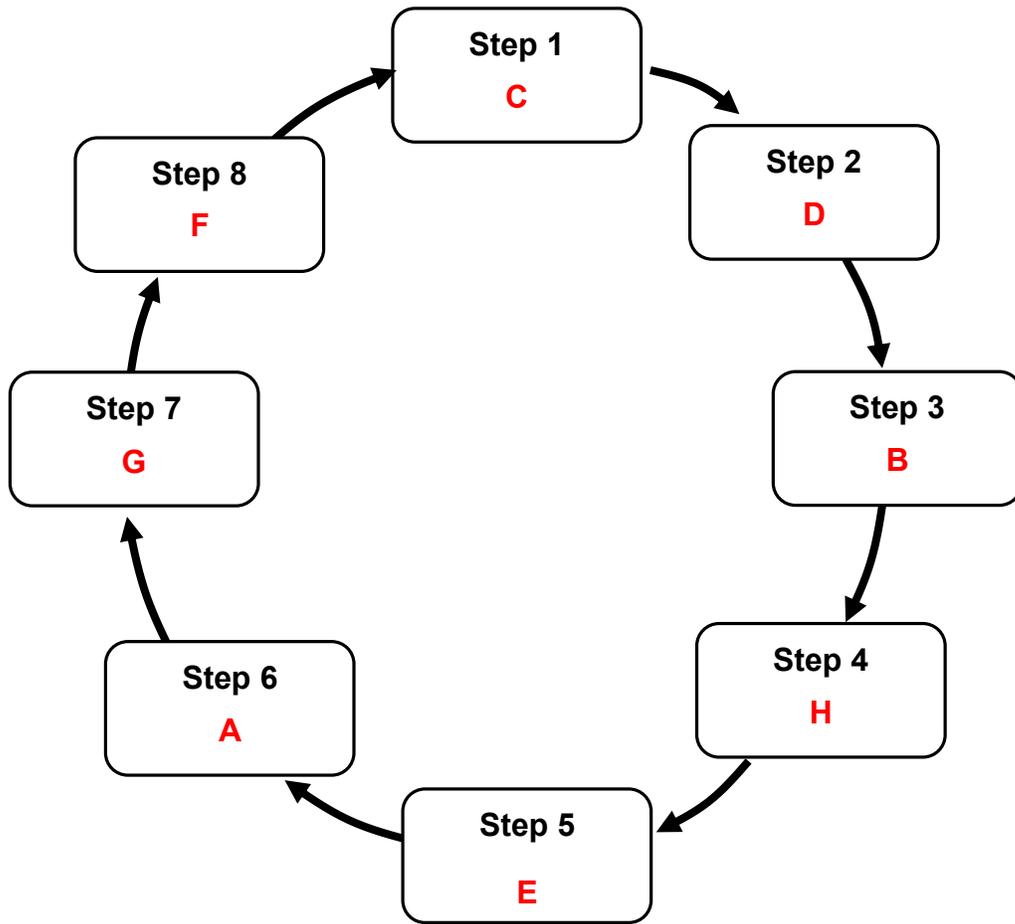
G. Communicate the solution

H. Select the best possible solution(s)

**Answer:**

**The correct order is: C, D, B, H, E, A, G, F**

*If you do not know what to put in the box for a step, leave it blank.*



Graphic source: Massachusetts Science and Technology/Engineering Curriculum Framework, October 2006, page 84.

**Q5.**

**John needs to create a boat from a 20-gram ball of clay. His boat must float and hold 10 marbles. To do this, he will follow the steps of the EDP. Match the steps (A-H) to his activities listed below.**

- A. Test and evaluate the solution**
- B. Develop possible solution(s)**
- C. Identify the need or problem**
- D. Research the need or problem**
- E. Construct a prototype**
- F. Redesign**
- G. Communicate the solution**
- H. Select the best possible solution(s)**

*If you do not know what EDP step to put next to John activity, leave it blank.*

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Class: \_\_\_\_\_

- G**     John reports and discusses his findings about the clay boat.
- F**     John makes changes to his design based on testing and feedback results.
- D**     John finds out how boats are made, characteristics of boats and clay, and what makes something buoyant.
- B**     John creates multiple plans for his boat.
- E**     John works with the clay to form it into a shape that can hold 10 marbles and maintain buoyancy.
- H**     Based on his research, John decides what boat design will hold all 10 marbles and float.
- C**     Using a 20 g ball of clay, John makes a boat that can float while holding 10 marbles.
- A**     John tries to float the boat with 10 marbles in it and notes how well it works and any issues that come up.

Q6.

Students have a box of ice pops to take to their ball game to sell on a hot day. They know they need a device to keep the ice pops from melting for three hours. They have a \$15 budget. Which step of the engineering design process does this show?

- A. identify a problem**
- B. test and evaluate
- C. redesign
- D. develop possible solutions

Q7.

Which of the following is part of the testing and evaluation stage of designing a cell phone?

- A. writing an advertisement for the cell phone
- B. defining the specifications for the cell phone
- C. finding a new material for the cell phone case
- D. trying to see if cell phone is waterproof**

Q7 adapted from the Massachusetts High School Technology/Engineering Test at <http://www.doe.mass.edu/mcas/2011/release/ghstecheng.pdf>