



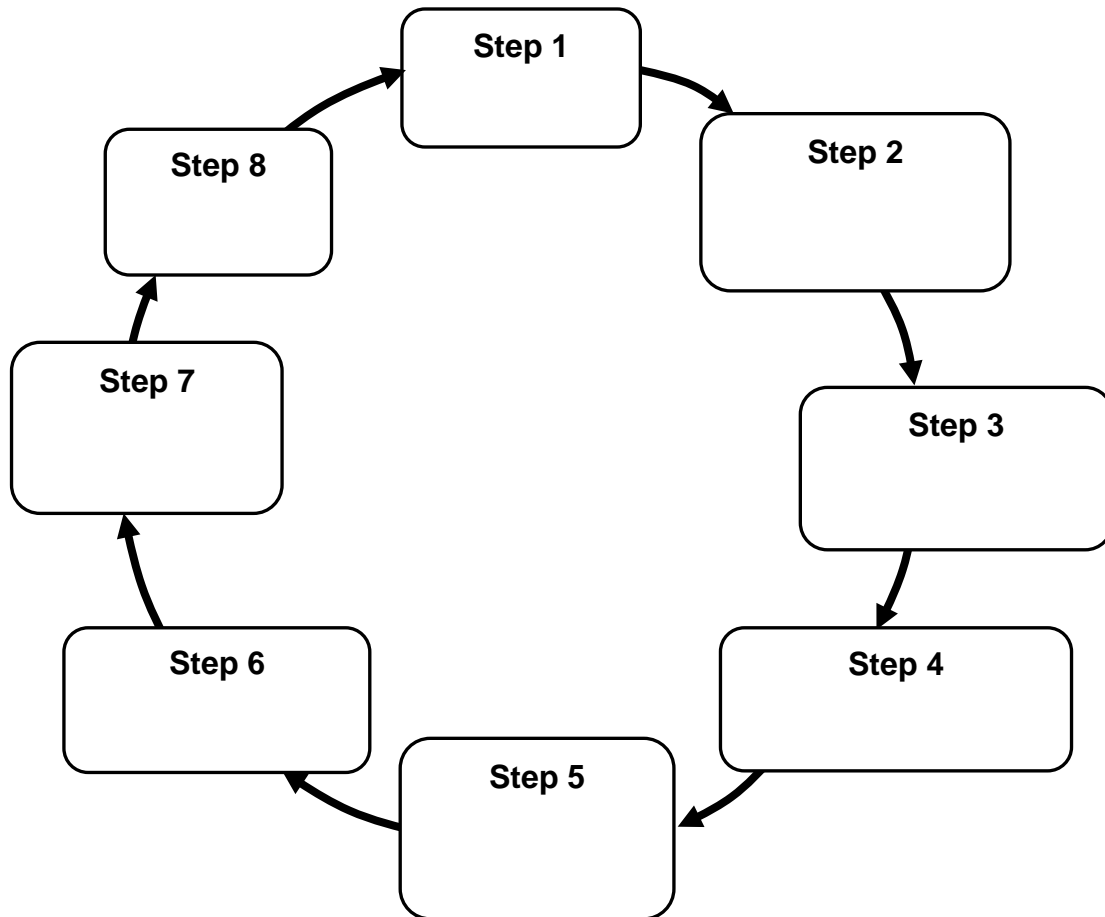
Engineering through Robotics and Automated Patient Care Activity – EDP Pre-Activity Test

Directions

Please answer the following questions.

- Q1.** When following the engineering design process, the different steps occur in which order?
- a) Clockwise 
 - b) Counter-clockwise 
 - c) In any order.
 - d) Both clockwise and counter-clockwise.
 - e) I don't know the answer.
- Q2.** Rob and his team have been chosen to build a wind turbine in the nearby mountains. The turbine needs to generate electrical energy and withstand the harsh winter environment of the environment. Rob and his team have done their research on the problem. What would be 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 this turbine.
 - e) I don't know the answer.
- Q3.** The Engineering Design Process is _____ to solve a problem.
- a) An iterative process.
 - b) A process that creates one prototype.
 - c) A quick process.
 - d) A process with a beginning and an end.
 - e) I don't know the answer.
- Q4.** Below are the eight steps of the Engineering Design Process, but they are not in the correct order. Please fill in the blank boxes in the diagram with the letter of each of the steps to show the correct order. *Note: If you do not know what to put in the box for a step, leave it blank.*
- 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)



(Source: Massachusetts Science and Technology/Engineering Curriculum Framework, October 2006, page 84.)

Q5. John needs to create a boat out of a 20 gram ball of clay. His boat must float and hold 10 marbles. He will use the EDP to do this. Match the EDP steps (below) to John's activity listed on the next page. (*Note: if you do not know what EDP step to put next to John's activity, leave it blank.*)

- 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)

- _____ John should report and discuss his findings about the clay boat.
- _____ John should make changes to his design based on the results of testing and feedback.
- _____ John should find out how boats are made, characteristics of boats and clay, and what makes something buoyant.
- _____ John should create multiple plans for his boat.
- _____ John should work with the clay to form it into a shape that will hold 10 marbles and maintain buoyancy.
- _____ John should decide, based on his research, what boat design will hold all 10 marbles and float.
- _____ Using a 20g ball of clay, John must make a boat that will float and hold 10 marbles.
- _____ John should try to float the boat with 10 marbles in it and note 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. The students know they need a device to keep the ice pops from melting for three hours in the hot sun. 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
- e) I don't know the answer.

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 the cell phone is waterproof
- e) I don't know the answer.

Adapted from <http://www.doe.mass.edu/mcas/2011/release/ghstecheng.pdf>