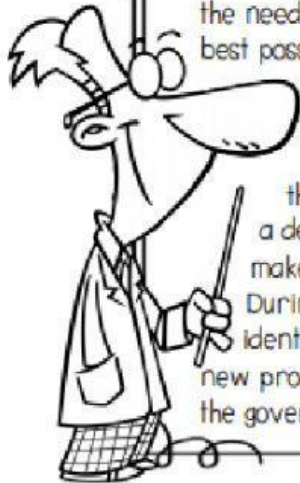


Introducing the Engineering Design Process



The **Engineering Design Process** is a series of eight steps that **engineers**, people trained to use science and technology, use to solve practical problems. The steps involve identifying the need or problem, researching the problem, developing possible solutions, selecting the best possible solution(s), constructing a prototype, testing and evaluating the solution, communicating the solution(s), and redesigning. Good engineers will **brainstorm** with other people to come up with several different ideas before choosing a path to take. When they make their prototype, a working model of their design, they will have to be mindful of **constraints**. These are factors that limit or restrict a design, such as only having a limited amount of time or money. Engineers might also make **trade-offs**, where they give up one benefit in order to obtain another. During this process, engineers will **troubleshoot** and **redesign** their products to identify and fix any problems that might occur. When a person develops a new product, they can apply for a **patent**, which is legal document issued by the government, to protect their invention for a limited time.



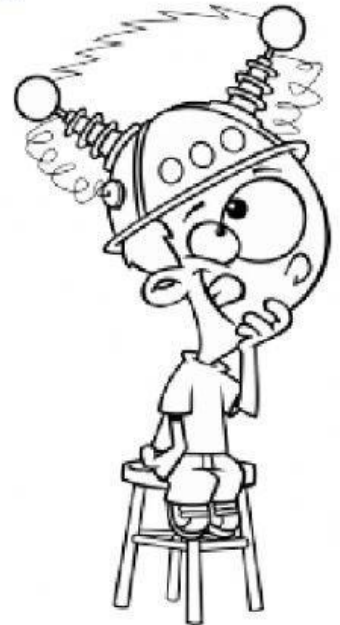
True or False

If the answer is true, write "true" on the line. If the answer is false, replace the underlined word or phrase with one that will make the sentence correct. Write the new word(s) on the line.

1. _____ Engineers will redesign their products when they find flaws.
2. _____ It is best to brainstorm by yourself so you can come up with a lot of great ideas.
3. _____ A person can sell a product that has a patent if they obtain permission from the patent holder.
4. _____ After researching the problem, you should begin constructing a prototype.
5. _____ Having access to unlimited resources is an example of a constraint.
6. _____ The first step of the Engineering Design Process is to select the best possible solution.

Put the eight steps of the Engineering Design Process in order from first to last:

- | | |
|-------------------------------|---|
| 7. ____ 1 st step | A. Test and evaluate the solution(s) |
| 8. ____ 2 nd step | B. Construct a prototype |
| 9. ____ 3 rd step | C. Research the problem |
| 10. ____ 4 th step | D. Identify the need or problem |
| 11. ____ 5 th step | E. Select the best possible solution(s) |
| 12. ____ 6 th step | F. Redesign |
| 13. ____ 7 th step | G. Communicate the solution(s) |
| 14. ____ 8 th step | H. Develop possible solutions |



Short Answer

Answer the following questions in the space below. Make sure to use complete sentences.

15. An ice-cream company decides to make a new lower calorie flavor, but testers reported that the flavor wasn't as good as the original. Is this an example of trade-off? Explain why or why-not.

16. A cookie company decides to develop a new chocolate chip cookie. They decide to test three different recipes at once. What are the advantages of making more than one prototype at a time?

17. What are three reasons why you should make your first prototype on a smaller scale?

18. What is an example of a trade-off that a car company might make?
