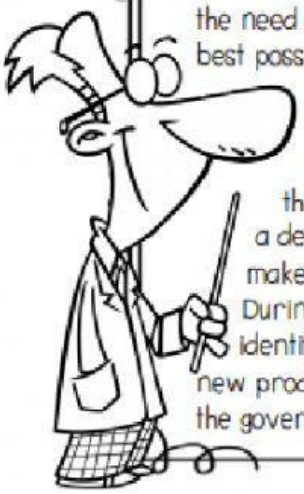
Name _____ Date _____ Section _____

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 <u>will</u> redesign their products when they find flaws.

2. _____ It is best to brainstorm <u>by yourself</u> so you can come up with a lot of great ideas.

3. _____ A person <u>can sell</u> a product that has a patent if they obtain permission from the patent holder.

4. _____ After researching the problem, you should begin <u>constructing a prototype</u>.

5. _____ Having access to <u>unlimited</u> resources is an example of a constraint.

6. _____ The first step of the Engineering Design Process is to <u>select the best possible solution</u>.

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

7. ____ 1st step
8. ____ 2nd step
9. ____ 3rd step
10. ____ 4th step
11. ____ 5th step
12. ____ 6th step
13. ____ 7th step
14. ____ 8th step

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

_____

_____

_____