Name: _____ Date: _____ Section: _____

Engineering Challenge!

Robotic Automation

The purpose of this activity is to learn to think about the many ways in which automating routine tasks can simplify your daily lives. Learning to think like an engineer is an important skill that will help you later in life no matter what career path you pursue. Engineers analyze problems or situations and then try to develop practical solutions.

Your engineering challenge is to think about the many routine activities in your life, select one, and then design an automated solution to handle it for you. Remember, to automate a system it must be able to operate without human intervention. You may not be able to actually develop a prototype of your design solution, but you can describe the different parts, how they will function together, and share the design with the class.

1. Begin by selecting a task or activity that you have to do frequently. The task you select should be something that would be glad to have a robot do for you.
2. Precisely describe the activity that must be completed. For example; perhaps you have to feed your dog at 6am and 6pm every day, and you do not like having to get up and feed her so early. (Sorry, this example may NOT be used!)
3. Describe the process that must be used to complete the task.
    a. Open closet door.
    b. Open up the dog food container.
    c. Fill the scoop up with 1 cup of dog food (too much or too little food would not be healthy for the dog).
    d. Pour the food from the scoop into the dog's bowl.
    e. Put the scoop back into the dog food container.
    f. Close the dog food container.
    g. Close closet door.
4. Now, think about different ways in which the food could be placed in the bowl. For example, you could premeasure the food into separate

containers in advance. Another idea would be to have a holding tank that would release exactly 1 cup of dog food. Can you think of any others?

5. Describe what input would start the process you decide on. If your dog were trained to step on a lever to dispense the food, then she could eat as often and as much as she wanted, so this would not be a good solution. A better solution might be to use an alarm clock in a circuit that would trigger the release of the dog food.
6. Describe the different technological processes that would be involved in your solution. In the example we are using, there might be a digital circuit that would activate the control board. The control board would make the door to open to allow the dog food to drop into the dog bowl. There would have to be a mechanism in the food tank to allow just one cup to be dropped each time.
7. Sketch a drawing of your solution and label all the different parts.
8. Create a model (non-working design) that will visually display your solution.
9. Combine the sketch, model, and written descriptions into a project proposal.
10. Present your solution to the class.