**SIMPSON STEAM-WORK ENGINEER BETTER MEDICINES CHALLENGE**

**DIRECTIONS:** You will work as part of a team to choose and define a problem and brainstorm, plan, design, build, test, and present a novel solution to that problem. The problem that you choose should have to do with one of the National Academy for Engineering’s Grand Challenges of Engineering. This document will provide you with more information about the Challenge. You should use it to identify a problem that will have an impact on YOU and people like you in the future, and you should work to develop a creative solution to that problem. The top 3 solutions will earn a STEM certificate of achievement as well as a worthwhile prize. Winners will be chosen by your peers. Good luck.

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**GRAND CHALLENGES:** The National Academy of Engineering, a national consortium of engineers, has identified fourteen issues that they see as the biggest engineering problems facing our world for the future. These Grand Challenges range from access to clean water to the threat of nuclear terror attacks, and represent problems that are both significant, and solvable by the next generation of engineers. For this challenge you will focus on the following challenge:

**ENGINEER BETTER MEDICINES:**Doctors have long known that people differ in susceptibility to disease and response to medicines. But, with little guidance for understanding and adjusting to individual differences, treatments developed have generally been standardized for the many, rather than the few.

For more information on challenges related to medicines, the National Academy of Engineering, and this challenge, go to: <http://www.engineeringchallenges.org/9129.aspx> on your mobile device or see the included handout.

**THIS CHALLENGE:** **To be successful in this challenge, you will work in a team to identify a specific problem related to medicines, you will follow the engineering process as laid out by your teachers, and you will complete each step of the process in a timely manner to create a creative and scientifically viable solution to the problem. Finally, in order to be eligible to win a prize, you will present your solution to your class, and then to the entire seventh grade.**

**TIMING:** Throughout thecourse of this project, you should follow the tentative schedule below. You can also use the chart on the back of this sheet to plan due dates and responsible group members for specific tasks related to the project.

**Week One:** Discuss challenge, choose team, define a specific problem, and begin brainstorming. Plan needed materials.

**Week Two:** Make a plan and begin building prototype.

**Week Three:** Finish building prototype. Test, modify, re-test.

**Week Four:** Make any last-minute changes. Prepare to present your solution.

**Week Five:** Practice presentation and present to your third period class.

**Week Six:** Present to the entire eighth grade in the theater.

**ORGANIZATION AND PLANNING: U**se the chart below to list the tasks that your group discusses through different parts of the challenge. Assign one or more group members to accomplish each task, and give each one a due date.

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| **Step of Engineering Process**  BRAINSTORM/  RESEARCH/PLAN  DEFINE THE PROBLEM | **Task** | **Who’s Responsible?** | **Due Date** |
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|  | BUILD A PROTOTYPE |  |  |
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|  | TEST/MODIFY/RE-TEST |  |  |
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| PRESENT SOLUTION |  |  |
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**MATERIALS REQUEST:** Use the chart below to list needed materials and their sources. Give this to your teacher at the end of STEAM-work time on week 1.

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| **MATERIAL NEEDED** | **REASON NEEDED** | **SOURCE OF MATERIAL** | **ALTERNATIVE MATERIAL** |
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