Team Name _____ Date_____ Student Name_____

Tsunami and Sand Bin Worksheet

An exercise in the engineering design cycle

In this exercise you will learn about the engineering design cycle while trying to protect a coastal village from being swept away by a tsunami. Here is a quick review of the engineering design cycle:

a) Identify the problem
b) Collection information/ understand your constraints
c) Propose/design potential solutions
d) Test solutions
e) Evaluate solutions – define how well solution worked and its cost (cost benefit analysis)
f) Report results
g) Refine solution (as necessary)

1. Set-up your desk with the tsunami sand bin, per your teachers instructions
2. Build 4-5 small houses out of the provided Legos
3. Arrange the houses on the flat part of the beach
4. Place the "wave maker paddle" into the sand bin, and make your first wave!!! (Your teacher will show you how to do this)
5. Record what happened:

6. Identify one problem posed by the tsunami your team would like to solve

7. Find the materials you can use to solve your chosen problem
8. List the constraints involved in solving the problem

9. Work with your team to develop and test 2-3 potential solutions – Document them on a separate sheet of paper. To document your solutions you should draw, describe and take

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photos of your solutions. Also test these solutions against 3 tsunamis and record the results. How well did each design perform in solving your stated problem?

Tsunami	Design 1	Design 2	Design 3
Wave #1			
Wave #2			
Wave #3			

10. Evaluate your solutions and choose the best over-all solution. Consider time, materials, impact on the community (for example, access to the ocean, view restrictions, accessibility).

Design	Costs – materials, limitations, community impacts	Benefits – How does this design address the problem? What are the positive aspects of this design?
1		
2		
3		

Which solution did you choose? Why? What were the benefits and what were the costs? Did you agree with your group?