NYSCATE DESIGN FOLIO

(Add additional pages as needed)

ACTIVITY TITLE -

Students in Group _____

Class and Period_____ Date _____

THE DESIGN CHALLENGE

INTRODUCTION

YOUR CHALLENGE

ARTWORK HERE PLEASE

Include photo or drawing

CLARIFY DESIGN SPECIFICATIONS AND CONSTRAINTS

RESEARCH AND EXPLORE THE PROBLEM

Think about your design criteria. What are the questions that you need to answer to help you design a solution?

What sources of information have you used?

What information have you gathered?

What are the *variables* affecting your design? (A variable is one of the factors that can influence the performance of your design).

Choose one of the variables. Predict how changing that variable might affect your design.

Write down the science exploration(s) you need to conduct to find out for yourself about important variables and their effects.

What data will you collect? How will you take measurements?

Describe the exploration(s) you have conducted and show how you used the results to improve your design.

GENERATE ALTERNATIVE DESIGNS

Describe four of your possible solutions to the problem. Remember to consider the specifications and constraints. In your description indicate what you consider each solution's strengths and weaknesses. Use the space at right for sketches, diagrams, or photos of ideas you would consider.

Alternative Solution 1.

Alternative Solution 2.

Alternative Solution 3.

Alternative Solution 4.

CHOOSE AND JUSTIFY THE OPTIMAL DESIGN

Choose your preferred solution. On what basis did you make your choice?

What tradeoffs did you make in selecting the alternative that you did?

CONSTRUCT A WORKING MODEL

What resources do you need to build a model of your design?

PEOPLE (WHO?)

INFORMATION (WHAT?)

TOOLS/MACHINES (WHICH ONES?)

MATERIALS (WHICH ONES?)

CAPITAL (HOW MUCH DO THINGS COST?)

ENERGY (WHAT TYPES?)

TIME (HOW MANY HOURS?)

Construct a working model of your solution. Photograph your model and place the photos in the space below.

TEST AND EVALUATE THE DESIGN SOLUTION

How will you test your model against the design criteria? Describe the test. Record the results.

What problems did you encounter in designing your solution?

If you were to redesign your model, what changes would you recommend in your design?

What science principles and mathematical modeling would help you to improve the performance of your design?

Optimization: What tradeoffs would you have to make if you made the recommended changes?

COMMUNICATING YOUR ACHIEVEMENTS

Describe the plan you will use to present your solution to your class. What presentation software and media will you use?

.

GROUP ASSESSMENT: Use this scoring guide to judge your group's success.

	Excellent (4)	Good (3)	Adequate (2)	Poor (1)
THE TECHNOLOGICAL DESIGN PROCESS **Research:** We did research by consulting other people, books, magazines, and on-line sources. We looked at existing models to get ideas.				
Generating Ideas: We came up with several different approaches that could be used as possible solutions. We used sketches, photos, and samples to show different ideas. We evaluated our ideas according to how well the met the specifications and constraints. We described problems we faced and made improvements to our design before we actually built it.				
Constructing the Model: We selected resources that were low cost and easy to get, and recyclable where possible. We used tools and materials efficiently and carefully.				
THE DESIGN ITSELF **Functionality:** We tested and evaluated our design. Our solution met the design specifications. It worked well.				
Impacts on People and the Environment: We thought about undesirable impacts when making design choices and eliminated any that might have been present.				
SCIENCE **Science Knowledge:** We used knowledge of science to help us make design decisions.				
Science Investigations: We identified the key variable relationships to be investigated and carried out a thorough scientific inquiry.				
Use of Data: We used a variety of data collection methods. We analyzed data thoroughly. We used charts and graphs to display data, and to show how our solution worked.				
MATHEMATICAL SKILLS AND REASONING We did our measurements and calculations accurately. We used formulas correctly. We thought logically during all the stages of the design process.				
COMMUNICATION We made a well organized and clear presentation to our class and used a variety of media. We discussed each aspect of the design process during the presentation.				
TEAMWORK Our group worked well together during the entire project. We planned tasks and maintained interest and effort throughout. We helped each other frequently and asked for help when we needed it.				
TOTAL POINTS=				