The Pasta Bridge Project (Student Handout)

Project Goal: To explore physical and mathematical relationships that apply to engineering.

Engineering is sometimes described as the application of scientific and mathematical knowledge to solve practical problems such as the design and construction of machinery, bridges, roads, waterways, or chemical processes. Engineering is divided into branches such as automotive, biomedical, chemical, civil, electrical, and mechanical (Gerver 58).

Task: To design and construct a bridge made out of pasta.

Mini-Tasks:

Individual

I. Select a bridge to research. Items to include in the journal article:

- Photograph or scaled drawing
- Associated dates
- Engineer's names
- Explanation as to why the bridge was built
- Societies' gains from the construction of the bridge
- Interesting facts
- What engineers learned from designing and constructing the bridge

You will be required to follow the feature article format as dictated by the Southern High School English Department. Instructions will be provided for those students who are not familiar with the MLA style of writing.

II. You will be expected to gather information for the design and construction of your bridge. This information will be obtained through classroom study of physics principles and mathematical formulas. It will be your responsibility to determine how these principles will apply to your bridge. You may use outside resources such as contractors and engineers for information as well. In addition, you will be required to organize your information into a working portfolio that will be checked throughout the project and turned in at its conclusion.

Group

You will chose a group of no more than three to complete the group portion of the project. Each member of the group will have a specific title. (For groups less than three, members may have more than one title) The roles are as follows:

Project Leader :	gets information to absent students, meets deadlines, fills in for absent members, coordinates the efforts of the entire group, ensures that members understand the material
Engineer:	main design ideas would come from this person, works with leader in assigning the various components to be built by the other members of the group
Treasurer:	develops the budget, ensures group stays on budget, keeps financial records, builds components as assigned

I. Create a company name and logo design.

II. Develop a plan for your bridge. The plan needs to include the following:

- scaled drawings
- estimation of material
- estimated cost of construction
- time table for construction

III. Using commercial pasta products only, construct your bridge to the specifications.(To be given later) Glue or epoxy of any brand may be used in the joints. Water color paints may be used. The bridge will be required to support 1 kg for 10 minutes.

IV. After the load test, you will write a proposal which will include the following:

- bridge operation and safety features
- economic benefits for the community
- records maintained during this project
- photographs or video documentation of the process from start to finish
- differences in the original estimations and the actual numbers
- discussion of the physical and mathematical principles used

V. Conduct a Community Exhibition in which you present and defend your work.

Assessment

Group Accountability:	The success of the bridge and its final report and the community exhibition shall be shared by all of the group members.
Individual Accountability:	The initial bridge journal article will go solely to the individual. Periodic tests/quizzes over the objectives and the portfolio will be as well.
Joint Accountability:	Each group member will evaluate the performance of duties as carried out by their partners. They will follow specific guidelines.
Self-Assessment:	You will provide a written self-assessment on how you did. You will answer these questions: (1) What did you learn? (2) How will doing this project help you in future endeavors?

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adapted from a unit by
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