



Quarrybrook

EXPERIENTIAL EDUCATION CENTER

Program Title: **Tension and Towers**

Audience: 6th-8th grade students

Program Theme: Students will gain an understanding of the forces of tension and compression. Students will compare different building materials, explore a unique structure, and build their own structures.

Program Goals: Students will be able to identify points of tension and compression as well as explain why structures can sustain certain loads.

Next Generation/Common Core Connections:

Topic: MS-ETS1 Engineering Design

Science and Engineering Practice: Developing and Using Models

Program Outline:



Teachers are always welcome to make any classroom-connecting comments that contribute to student understanding.

Activity 1: MATERIALS (10 min.) – Students will compare and contrast different building materials.

Objective: Students will understand that the strength of a building and its materials is relative to how it is put together.

Intended Outcome: Students will be able to explain the pros and cons of different building materials.

Activity 2: TENSION vs. COMPRESSION (10 min.) – Through hands-on investigations, students will experience tension and compression.

Objective: Students will gain an understanding of tension and compression.

Intended Outcome: Students will be able to identify points of tension and compression between them and a partner.

Activity 3: WOODLAND HALL (20 min.) – Students will explore Woodland Hall, our post-and-beam room, and gather information about its structure.

Objective: Students will recognize the tension and compression within the structure of Woodland Hall.

Intended Outcomes: Students will be able to identify points of tension and compression in Woodland Hall, and be able to explain their reasoning.

Activity 4: HOW TREES STAND UP (30 min.) – Students will gain an understanding as to why wood is a beneficial building tool.

Objective: Students will understand that trees grow based on a variety of factors, including gravitational pressure and distribution of weight.

Intended Outcome: Students will be able to explain why not all woods are good for building.

Activity 5: TOWER OF PASTA (50 min.) – This activity will be an opportunity for the students to experiment with building a tall structure, while aiming to support the greatest amount of load.

Objective: Students will build a tower as high and as strong as they can, using a limited supply of materials.

Intended Outcome: Students will be able to explain why some structures were able to hold more weight than others.