

**Technology Education
Twelve Corners Middle School**



Technology LEGO Engineering Challenge Mountain Tug of War

Identify and Define the Problem

Design and construct a vehicle/device that is capable of competing in a mountain tug of war competition. In other words, construct a vehicle that while attached to a competitor, will climb a mountain, descend the other side and pull your opponent backwards.

Set Goals and List Rules:

Using tech money you will rent a Lego kit of parts and **only those parts** may be used in the construction of your device. All hands on work must be completed in the technology laboratory. You may consult any resource at your disposal. Many technological, mathematical, scientific and engineering principles must be addressed so design and construct carefully.

There are size limitations to your vehicle. The vehicle must fit into an imaginary 8" cube. In other words, no part may extend more than 8" from your vehicle in any direction.

The playing field is in the shape of a mountain and your device will start past the midpoint of the crest and pull towards you. A lanyard (rope) will be attached to each vehicle and the one with the most rope on their side, past the midpoint, after 30 seconds, is the winner. The time for the match will be "running time" it will not be reset unless the lanyard becomes entangled with the vehicles. You must win by $\frac{1}{2}$ " and the measurement is taken after the power is off and all movement stops. If your vehicle flips or falls apart then it is a loss! You must design a place to connect the lanyard at the very rear of your vehicle. No human strength may be used to pull your device.

The competition will consist of random pairings and double elimination. You can work in groups of 2 or 3, and your group must complete a design journal throughout the entire activity. Grading will be determined by the quality of the design journal, a learning challenge (test), and competition results. As part of the design process, or at any time, you may patent specific ideas for the competition subject to the instructor's approval. Your vehicle/group must have a name. The instructor reserves the right to clarify/add rules as necessary. All competitors will be informed before the competition of any rule change. Controversial decisions may be made during a competition and are ruled by the instructor.

Awards:

First:	Your rent fee returned and an additional	\$350 Tech Dollars/and Mystery Prize
Second:		\$300
Third:		\$250
Fourth:		\$150