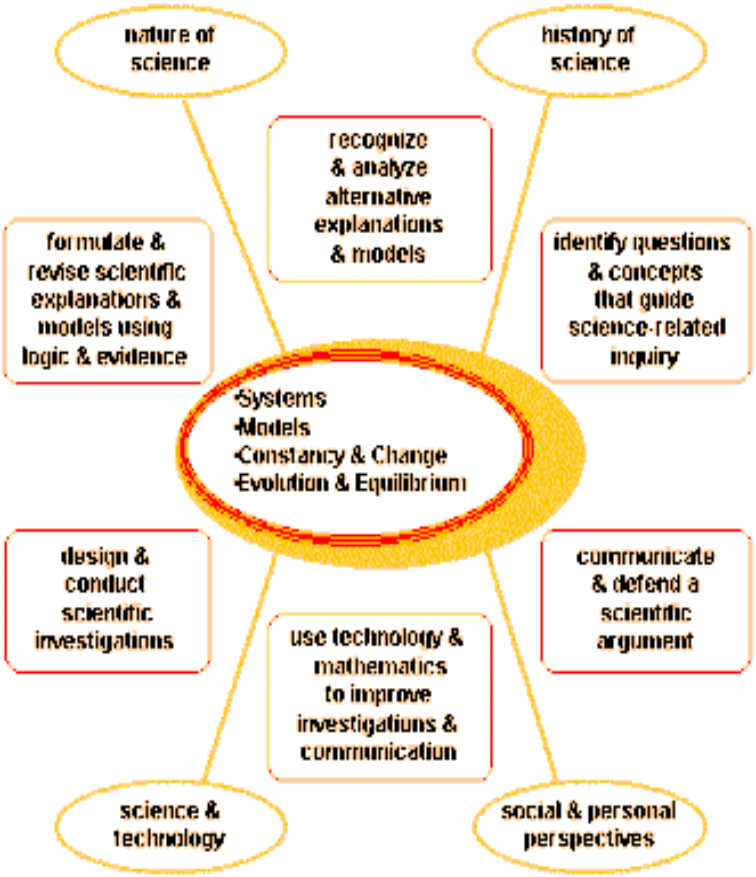
Student Mousetrap Powered Automobile

Learning Area: Scientific Concepts and Application
Educational Level: Middle School
Content Standards: Physical Systems

A student shall demonstrate understanding of the fundamental laws and concepts of the physical world including properties of matter, physical and chemical changes, transfer of energy, and force and motion by: creating a model to illustrate a contemporary or historical concept, principle, theory, or law.

LARGE PROCESSES/CONCEPTS:



NEXT STEP: Assessment Task

Student Mousetrap Powered Automobile

ASSESSMENT TASK:

Description:
Prior to building a model propelled vehicle, the student will be able to demonstrate understanding and interaction of physics of motion terms. The terms are, but not limited to: **machine, motion, magnitude, vector, velocity, acceleration, efficiency. (Definitions are found in any Physical Science textbook).** The following describes how a vehicle, student made, using one standard mousetrap may be made to operate using the motion principles learned.

Overview:
Statement of Purpose
Design and construct a mousetrap vehicle demonstrating physics of motion concepts.

Step I. Introduction to terms needed to fully understand activity. These terms include:

Machine, motion, magnitude, vector, velocity, acceleration, efficiency

Students will be quizzed on these terms before any construction begins on this project.

Step II. Construction of the car.

1. Student teams are assigned and given one standard Victor mousetrap. These traps are often on sale at two for $1. Schools have a petty cash allowance for such inexpensive items.
2. Student teams locate construction materials like wheels and the body for their car on their own. The mousetrap, they should be reminded, must be the sole source of power.
3. There are no size or weight limitations, but ties will be broken by the weight of the vehicle. In the event of a tie, the less the mass, they higher the rank.
4. Car designs will be explained to the class by each team prior to the competition. Each team will explain how they incorporated the scientific principles into their vehicle.
5. Each team will run twice a timed flat course down a hallway. All members of the team must wear goggles.
6. Adjustments may be made between runs. No new items will be added.

Student Mousetrap Powered Automobile

ASSESSMENT TASK:

7. The best time over a course of approximately seven meters will be declared the winner.
8. Ties will be broken by the mass of the vehicle. The lesser mass will be declared the winner.
9. Winners from each class and/or other teachers may be arranged to compete against each other.
10. A data table may be placed on the board that resembles the following:

TEAM NAME:	mass (grams)	distance (meters)	time (seconds)	avg. speed
1.				
2.				
3.				
4.				
5.				

NEXT STEP: Checklist

Student Mousetrap Powered Automobile

CHECKLIST:

STUDENT	TEACHER	
_____	_____	Demonstrates understanding of science terms relating to motion.
_____	_____	Constructs operable mousetrap vehicle.
_____	_____	Shows principles of motion incorporated into design.
_____	_____	Operates vehicle to fulfill distance requirement.
_____	_____	Completes data table.
_____	_____	Identifies improvements needed to increase efficiency.