Simple Machines

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Visiting the MOST

To make your visit to the Milton J. Rubenstein Museum of Science & Technology as meaningful as possible:

A Explore and complete some of the online pre-visit activities with your students.

B Design pre-visit, during and post-visit plans that includes activities and demonstrations that you select.

C Discuss your plan with a MOST education staff member prior to your visit.

D Plan your large group to be divided in a ratio of 8 to 10 students per chaperone.

E Cue the chaperones about their roles. They should be engaged with the students and assisting them with their hunt for answers and monitoring the materials provided.

F Relax and have fun!

Inside This Packet

Name: _____ Date: _____

Directions:

The answers to the following questions are found in the simple machine corner of the museum located near TechnoTown.

1 Which is easier to lift, the weight on rollers or the weight without rollers? Explain:

_____

_____

_____

2 How much rotation does a helical gear provide?

_____

_____

_____

3 Try this: Turn the crank on the gear system counter-clockwise. Count how many times the direction of rotation changes in this gear system. Can you align all the colored bars on the gears?

_____

_____

_____

4 Draw the three levers with the 30 lbs. on the end of each arm. Note in your drawings the location of the fulcrum. Use a measuring tape to determine the distance of the fulcrum.

a | *b* | *c*

Name: _____ Date: _____

5 Which lever system feels the easiest to move? Explain your thoughts.

_____

_____

_____

6 Which lever does the most work? Explain your thoughts.

_____

_____

_____

7 Calculate the effort force for each of the cases above, using the information that follows to assist with this problem.

_____

_____

_____

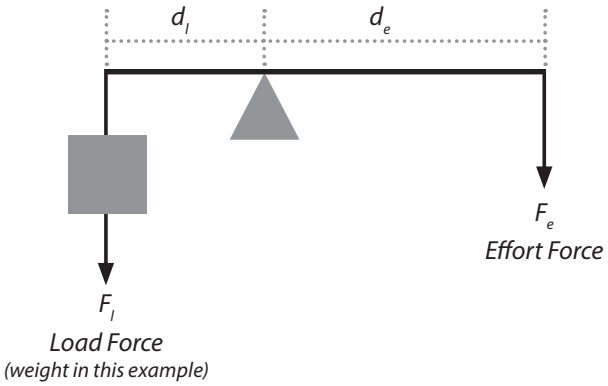
a Case 1

b Case 2

c Case 3

Name: _____ Date: _____

A lever is a mechanism that can be used to exert a large force over a small distance at one end of the lever by exerting a small force over a greater distance at the other end of the lever.



In general the effort force can be expressed as

$F_e = F_l d_l / d_e$

where
F_e = *effort force (N, lb)*
F_l = *load force (N, lb) (note that weight is a force)*
d_l = *distance from load force to fulcrum (m, ft)*
d_e = *distance from effort force to fulcrum (m, ft)*

8 Which pulley is the easiest to lift and why?

_____

_____

_____

9 What simple machine is adapted to make a screw?

_____

_____

_____

9 Go to TechnoTown. Find and identify three simple machines in the system. Tell the purpose of the machine.

Simple machine name	Describe Location	Purpose of machine

Notes:

New York State Elementary Level Science Standards

Inquiry and process skills:
Gathering and organizing data, generalizing, inferring, making decisions manipulating materials, observing, predicting

Standard 1: Scientific Inquiry:
Key Idea 1: s1.1, s1.1a, s1.1b, s1.2, s1.3
Key Idea 2: s2.3a
Key idea 3: s3.1a, s3.4a, s3.4b

Skills and strategies for interdisciplinary problem solving:
working effectively, gathering and processing information, generating and analyzing ideas, presenting results

General Skills:
i, iii, iv, vi, ix, xii, xiii, xiv, xv, xvii