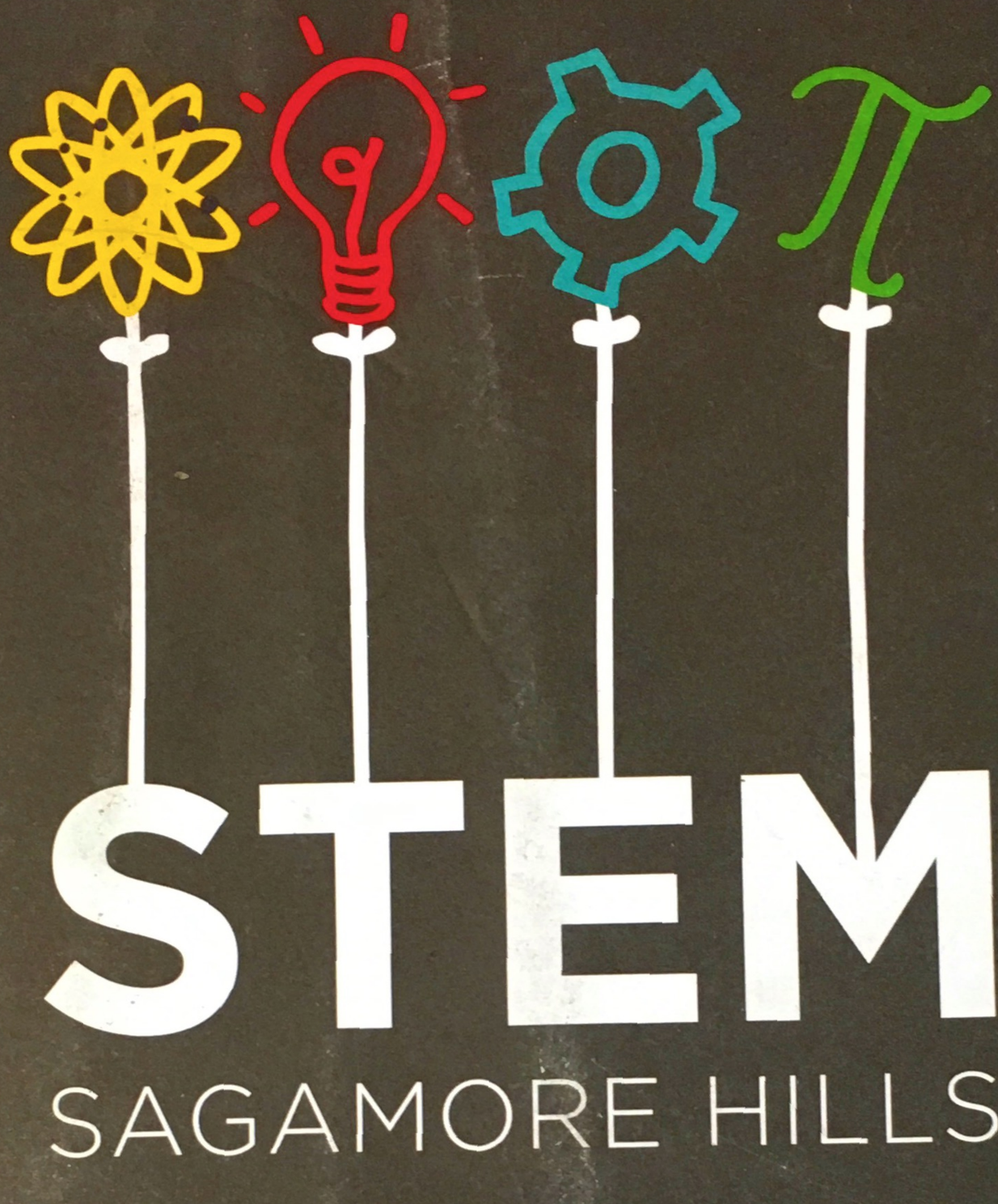


STEM

SAGAMORE HILLS

NAME Nicole Zambrano GRADE 4 TEACHER Lambert

Bridge

3-24-16

Test #2: Which Hits with More Force?

Place both balls on the lid and hold it above the tub of sand. Quickly pull the lid down and away so that the balls will drop into the tub at the same time.

1. Describe what the sand looks like where the two balls have fallen.

The golfball crater looks deeper because it is heavier. The pingpong ball you can beardy see it because it is lighter

2. By looking at the craters in the sand, which ball seemed to fall with more force? Why do you think that is?

The golfball, because it has more mass than the pingpong ball.

3-24-16

Sagamore S.T.E.M. Standards Correlation Chart

Science

S4P3- Demonstrate the relationship between a force and the resulting change in position

Math

MGSE.5NBT.5- Apply multiplication and division to calculate force.

S.T.E.M.

Building Bridges with Bennett & Pless

Social Studies

Development of architectural structures through history.

Language Arts

Apply vocabulary specific to the engineering of bridges

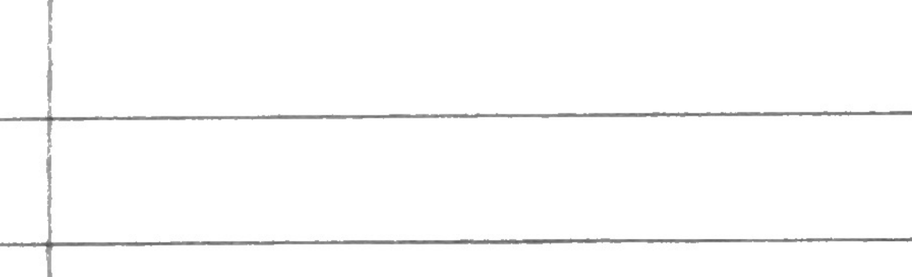
3-24-16

Step 1 - Define the problem - Design a bridge that will hold the most weight and deflect the least.

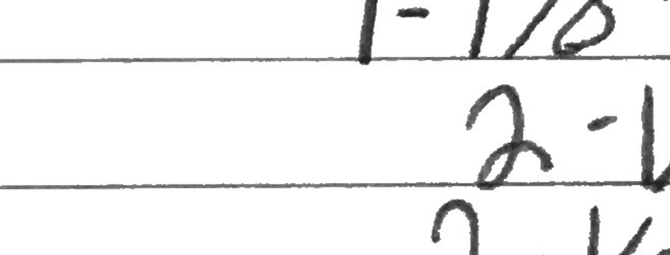
Step 2 - Collect Information - • All bridges will be loaded and tested the same way
• The bridge will have a span of 34"
• Materials -
Glue
Balsa Wood -
2 - 1/4" x 1" x 36"
1 - 1/8" x 2" x 36"
2 - 1/4" x 36"
2 - 1/2" x 1/4" x 36"

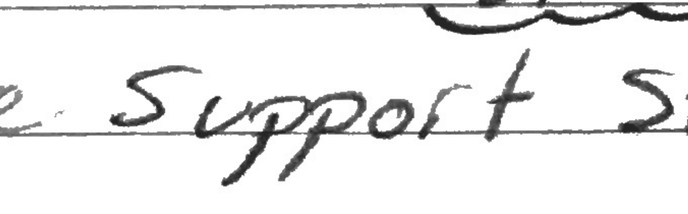
Common bridge support structures -

Arches

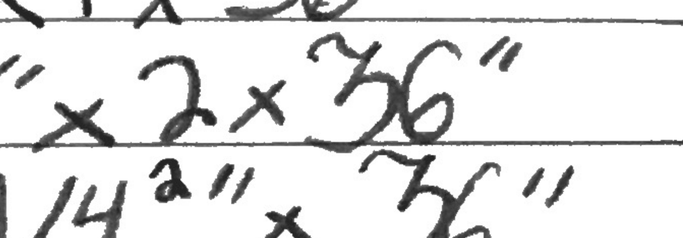


trusses



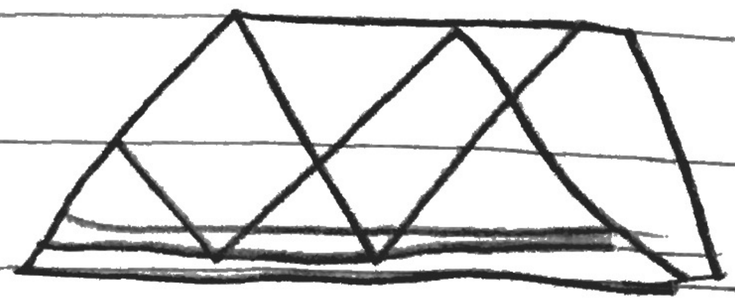


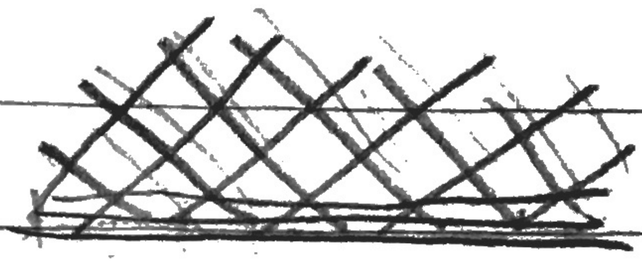
cables



3-25-16

Step 3- Develop possible solutions -



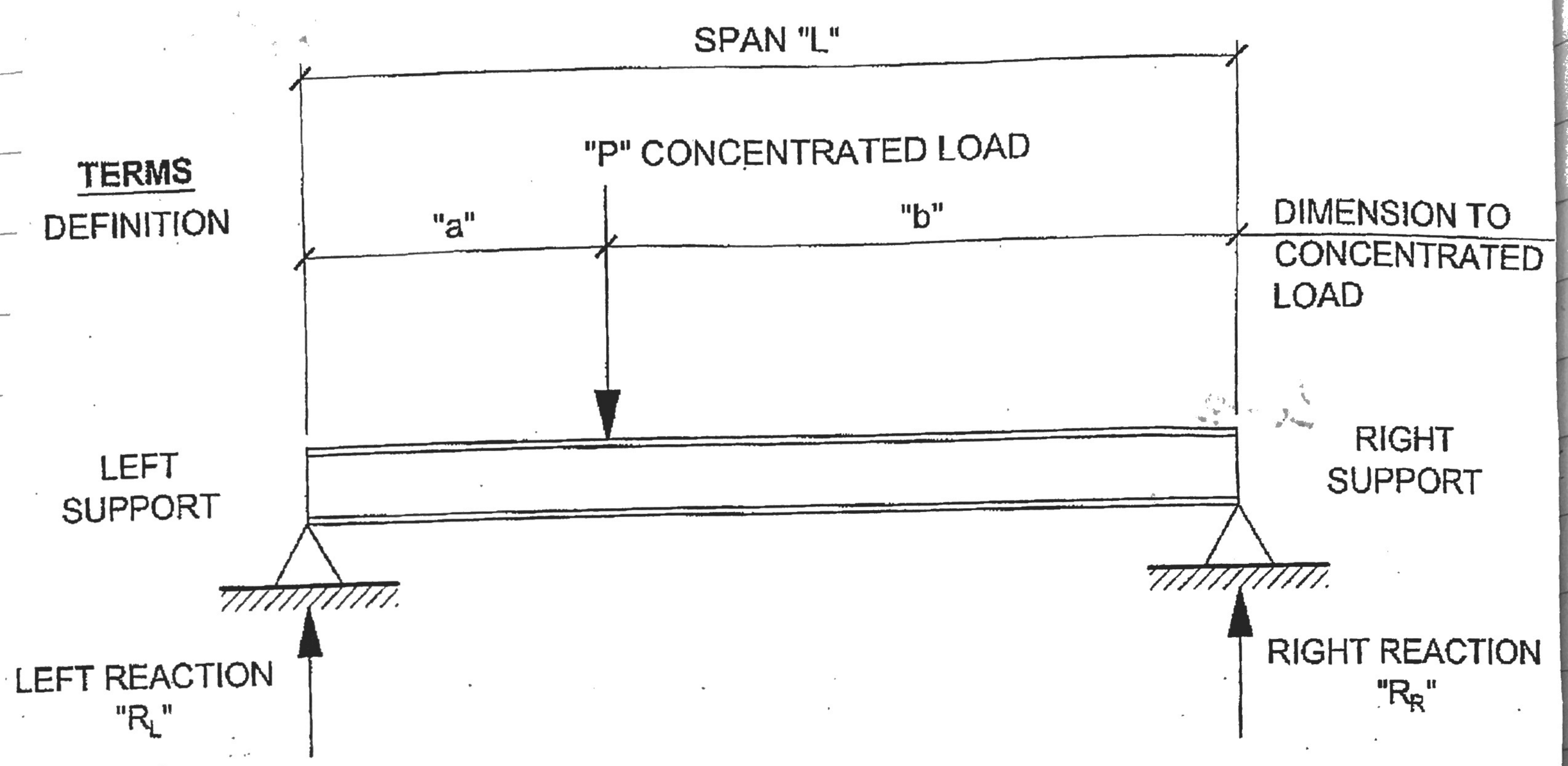


Step 4- Select one solution -

We think this is better because it has

3-31-16

Calculation of Single Span Beam Reactions



CALCULATION

LEFT REACTION $R_L = \frac{P \times b}{L}$

RIGHT REACTION $R_R = \frac{P \times a}{L}$

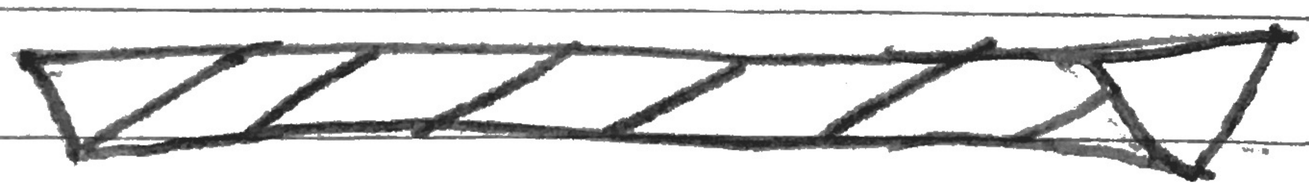
4-12-16

Evalute the Solution.

Max Deflection:
N/A

Max Load:
13lb 4ounces

Redesign: I think ours needed more members. It didn't have support in our bridges. I think our bridges doesn't need crossing sticks under it to keep it sturdy.

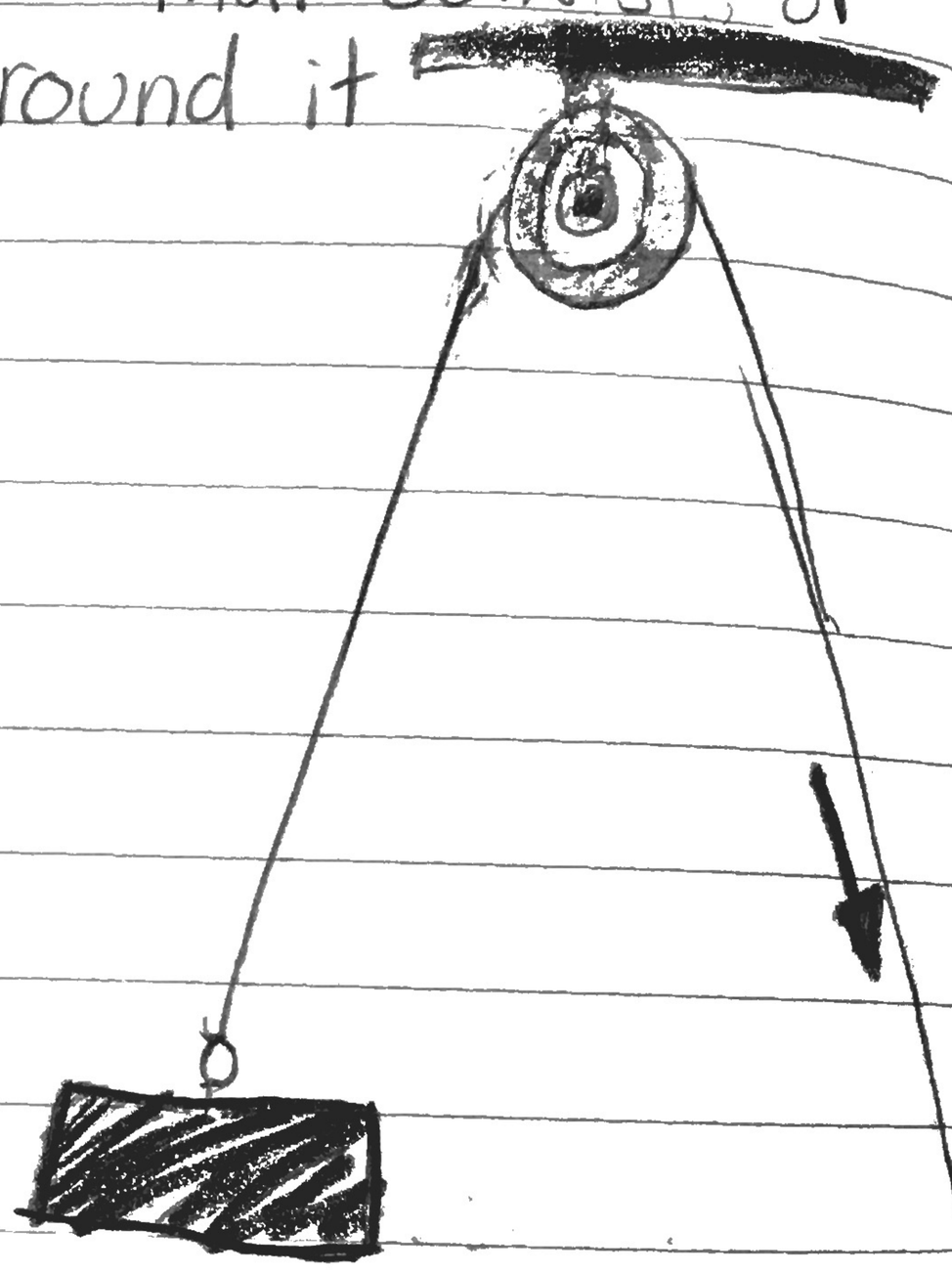


Simple Machines

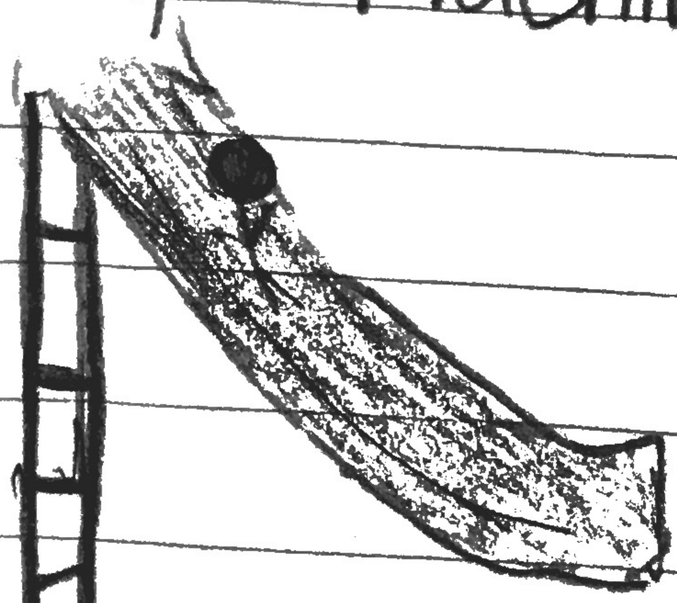
4-14-16

Screw - A simple machine made of a post with an inclined plane wrapped around it

Pulley - A simple machine that consists of a wheel with a line around it



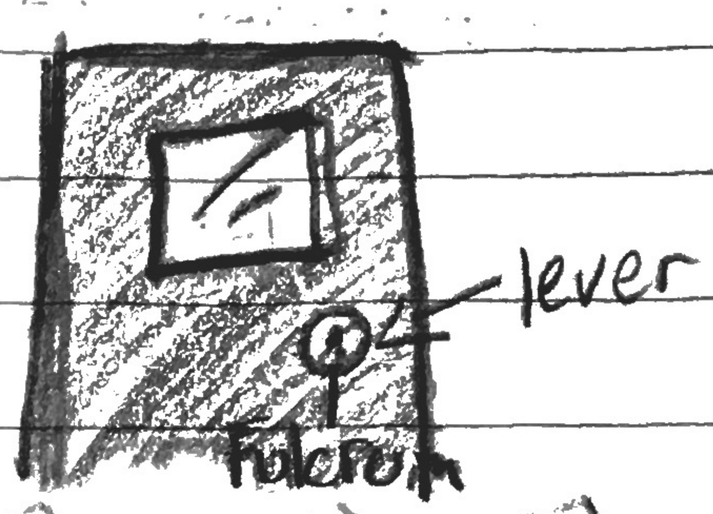
Inclined plane - A simple machine that is slanted surface.



4-4-16

lever - A simple machine made of a bar that pivots on a fixed point.

Fulcrum - The fixed balance point on a lever.



Wedge - A simple machine made of two inclind planes placed back to back.

Wheel and axle - A simple machine made of a wheel and an axle that turn together

Simple Machine - A machine with few or no moving parts that you apply just one force to

Simple Machine Subsystem

Science

Supporting-
Identify simple machines and explain their uses (levers, pulleys, wedges, inclined plane, wheel and axle)

Math

4.MD.1 - Solve problems including measurement and conversion of measurements from a larger unit to a smaller unit.

4.MD.4 - Represent and interpret data

S.T.E.M.

Simple Machine Subsystem

Social Studies

SS4E1.c - Describe how specialization improves standards of living

Language Arts

RI4.1 - Summarize a nonfiction work by recalling details and examples in the text

RI4.4 - Understand the meaning of words and phrases in 4th grade Science texts

Technology

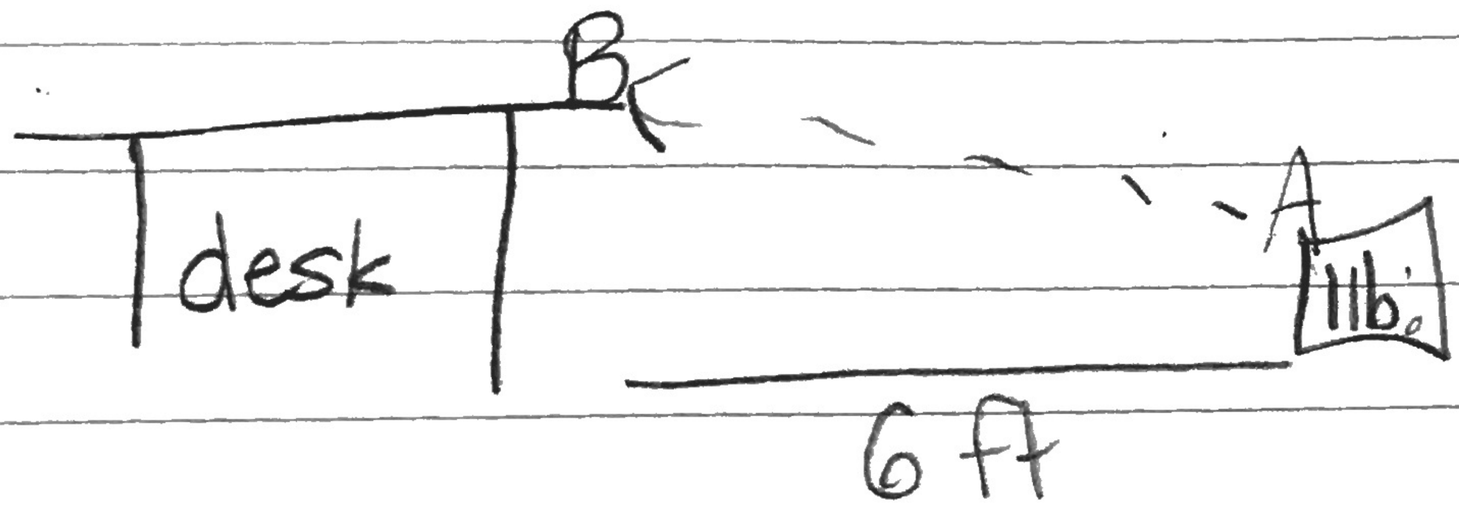
- Pulley
- lever
- scale (weight)
- wheel and axle
- Spring scale (force-N)

4-21-16

Simple Machine Subsystem

Required Simple Machine lever

Step 1: Define the Problem - We are creating a subsystem that uses a lever that will lift a 1 pound weight to the desk that is 6 ft away.



Step 2: Collect Information -