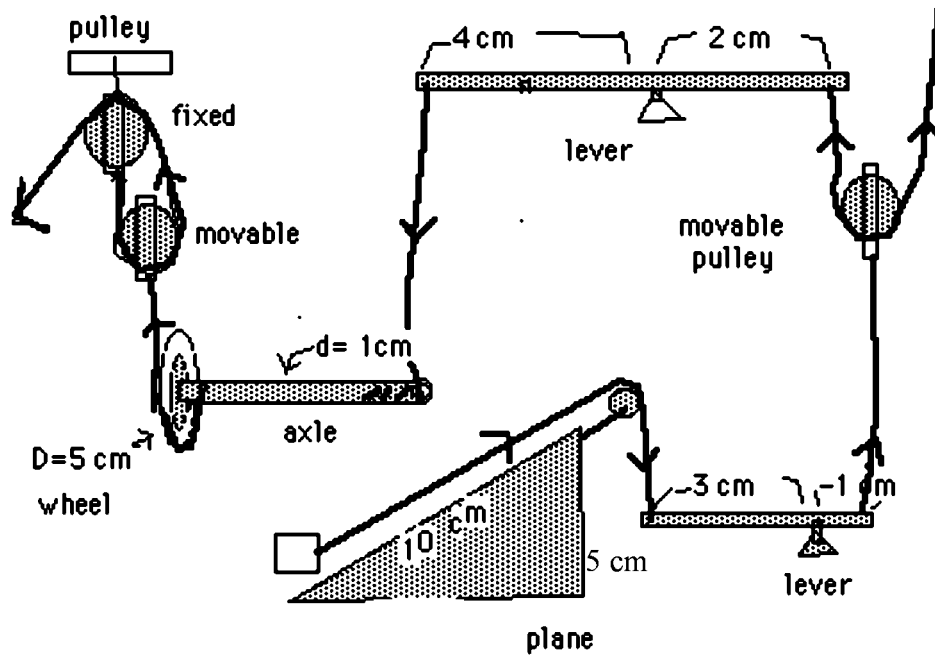


FRIDAY, FEB 4, 2005

TRY:

How do you find the mechanical advantage of a compound machine like this?



TODAY,

- Discuss compound machines
- Go over Energy Project assignment

In Class:

- Finish machine lab
- Start compound machine work, due Mon. Feb 7<sup>th</sup>

NAME \_\_\_\_\_

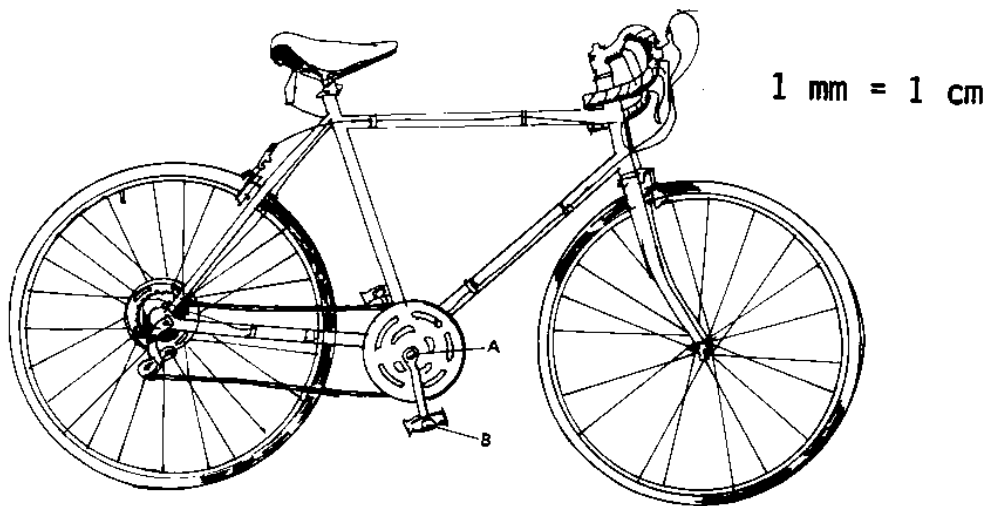
## Compound Machines

### 1) **BIKE IT!**

Label all the types of simple machines that you see in this bicycle and explain how it could be considered a compound machine.

Estimate the ideal and actual mechanical advantage of each part and of the whole machine.

Explain where work is lost, and what it turns into.

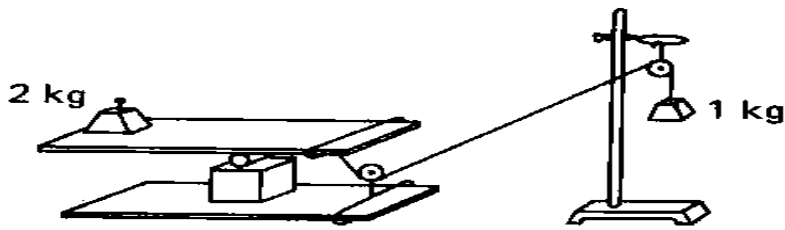


what advantage does shifting gears have on a bicycle?

Does the rear wheel move more distance or less distance for every revolution than the pedals?

Why are the pedals longer than the gear wheels?

Why do small children's bikes have smaller wheels?



If the fulcrum of this 1 meter long lever is placed at 60 cm from the string, and the 1 kg effort exactly balances the 2 kg mass then find:

The ideal mechanical advantage of the lever:

The ideal mechanical advantage of the first pulley:

The ideal mechanical advantage of the second pulley:

The ideal mechanical advantage of the entire compound machine.

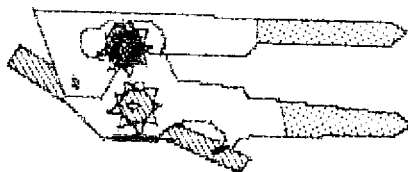
The actual mechanical advantage of the entire compound machine.

The efficiency of the entire compound machine:

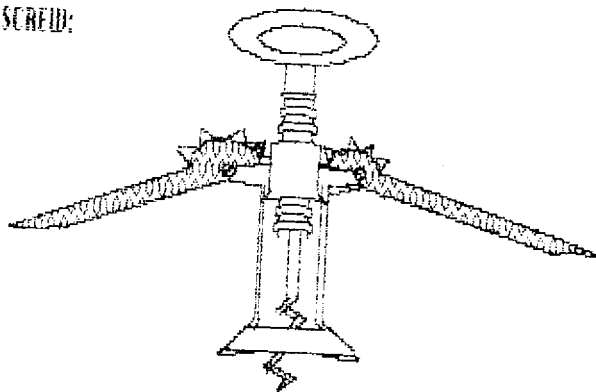
Where was work lost?

What could this be used for?

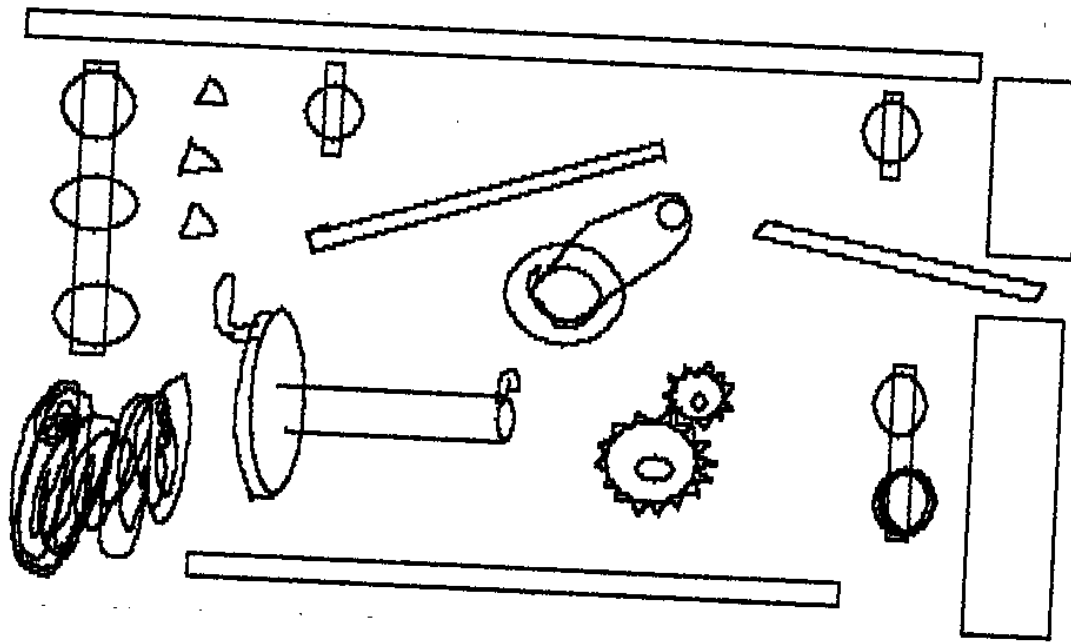
CAN OPENER:



CORKSCREW:



Label each type of simple machine that you see in the compound machines above.



1 triple pulley, 1 double pulley, 2 single pulleys, 4 boards (ramps or levers), 3 fulcrums, 2 blocks, 1 wheel & axle, 1 gear set, 1 double wheel set, lots of string!

Pretend you could attach these machines to a wall.

Invent a compound machine that uses at least 6 of these machines that could lift a 50 kg mass with 4 Newtons of force. Draw IT!!!

Make up measurements and show the ideal mechanical advantage at each step.

Predict what the actual mechanical advantage of the entire machine is, and where work is lost.

What would the work out compared to the work in be? What is its efficiency?