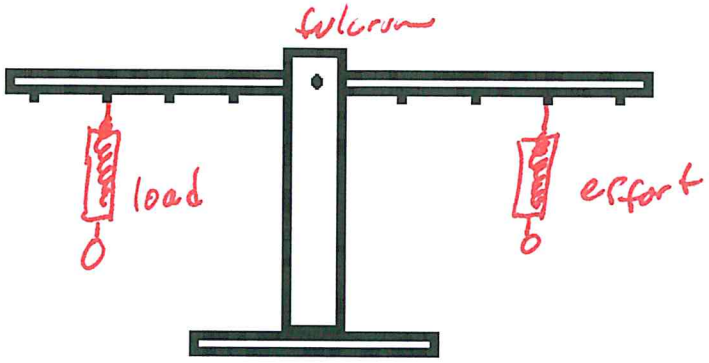
Grade 8 Science – Levers and Mechanical Advantage

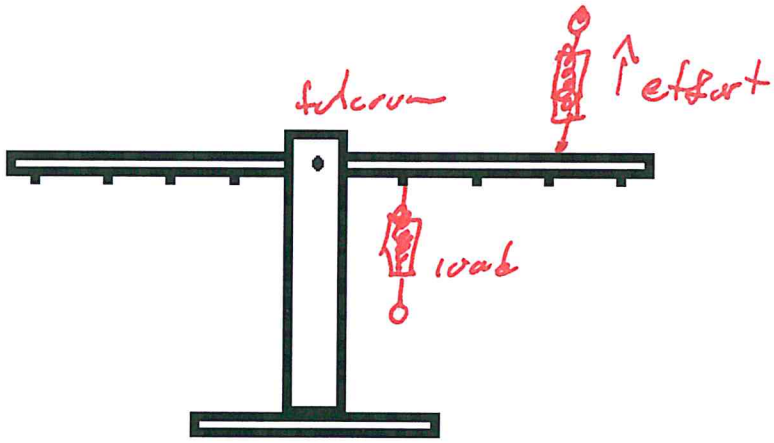
Name: Answer Key Class: _____

Given the lever apparatus, create the three classes of levers and label how you put the load spring and the effort spring.

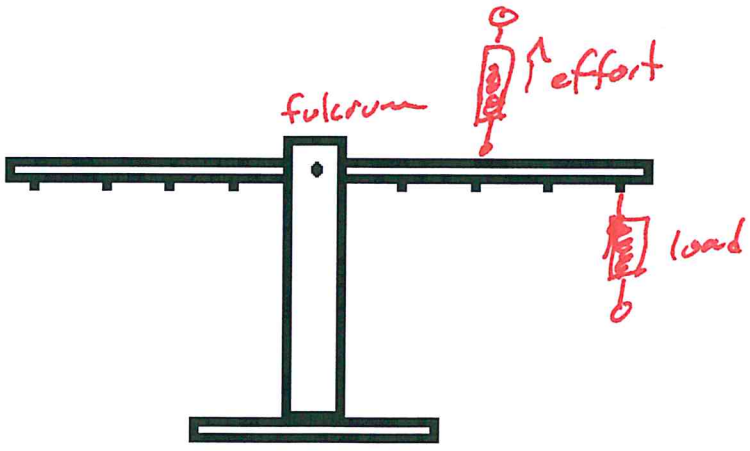
Class 1



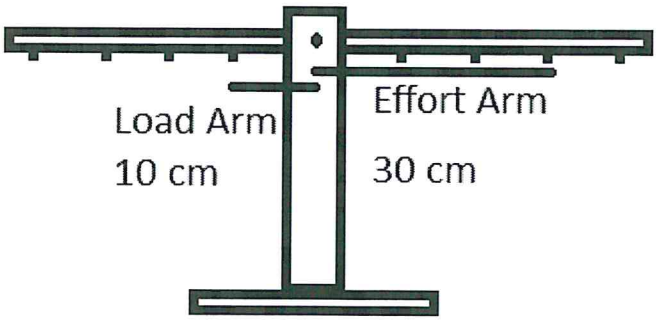
Class 2



Class 3



Mechanical advantage is calculated by measuring the ratio of the length of the effort arm to the length of the load arm.



In this example, the load is 10 cm to the left and the effort is applied 30 cm to the right. So, using the formula MA = EA/LA,

Mechanical Advantage is Effort arm divided by Load arm

$$MA = \frac{EA}{LA}$$

$$= \frac{30\ cm}{10\ cm}$$

= 3 (Notice how the units cancel out and we are left with just a number.)

If you test this out, the forces should be quite similar to the calculated value. Try arranging the apparatus to show this and put 1N of force (100g) on the effort load spring. What is the actual reading of the load spring?

Was it exactly 3 N? Why is this so? It was very close - not exact - due to friction or reading error or not straight.