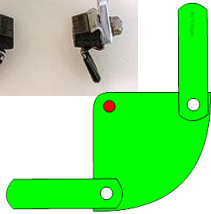


D&T Knowledge Organiser – Levers and Linkages

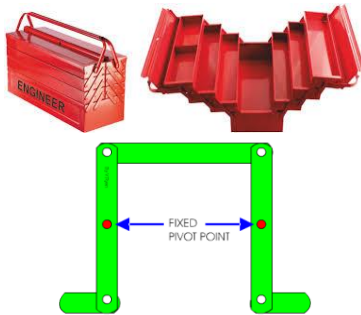
LINKAGES



BELL CRANK LINKAGE:
This linkage allows horizontal movement to be converted to vertical movement. It also works the opposite way round. A practical example of this is the brake mechanism on a bicycle.

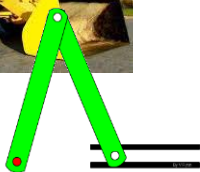
PARALLEL MOTION LINKAGE:

As the large rod at the top of the diagram moves to the left the two small rods at the bottom move to the right. All the rods are parallel to each other.

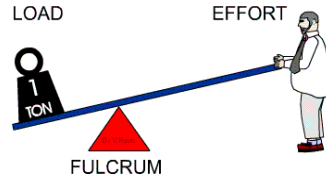


CRANK AND SLIDER LINKAGE:

The rods move forwards and backwards in slider. The fixed pivot anchor the linkages to one place.

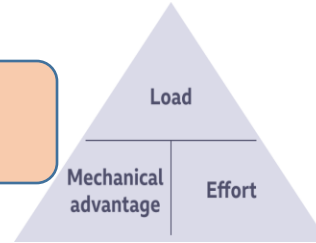


LEVERS



The longer the 'rod' the easier it is to lift the weight. Under normal circumstances the person would not be able to lift the weight at all. The *fulcrum* is the place where the rod *pivots* (or rotates).

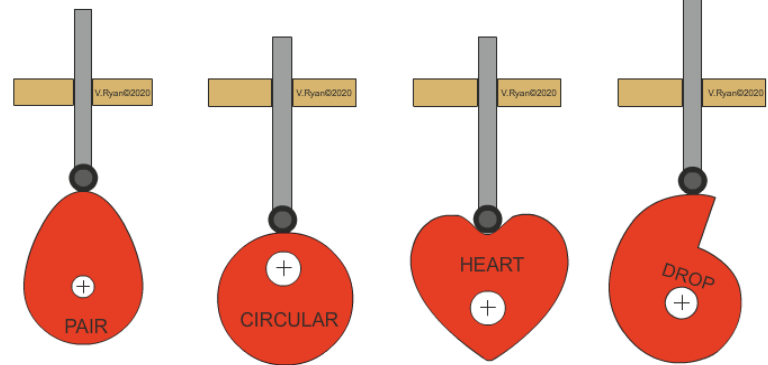
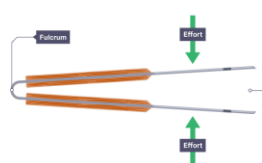
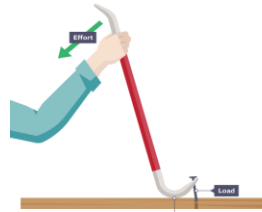
- mechanical advantage = load ÷ effort
- load = mechanical advantage × effort
- effort = load ÷ mechanical advantage



First order levers (Class 1) place the fulcrum between the effort and the load.

Second order levers (Class 2) place the fulcrum at one end of the lever and the effort at the other, with the load in the center.

Third order levers (Class 3) place the effort between the fulcrum and the load. If the effort and the fulcrum are further apart, it becomes easier to lift.



PEAR

Pear shaped cams are used on the shafts of cars. The follower remains motionless for about half of the cycle of the cam and during the second half it rises and falls.

CIRCULAR

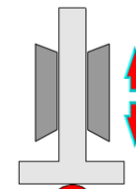
Circular cams or eccentric cams produce a smooth motion. These cams are used in steam engines.

HEART

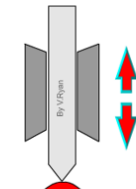
Heart shaped cams allow the follower to rise and fall with 'uniform' velocity.

DROP

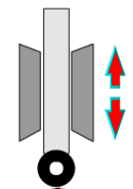
What type of movement do you think this cam profile will give?



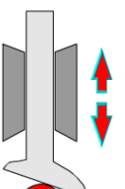
FLAT FOLLOWER



POINT/KNIFE FOLLOWER



ROLLER FOLLOWER



SCREW FOLLOWER

MECHANISMS

