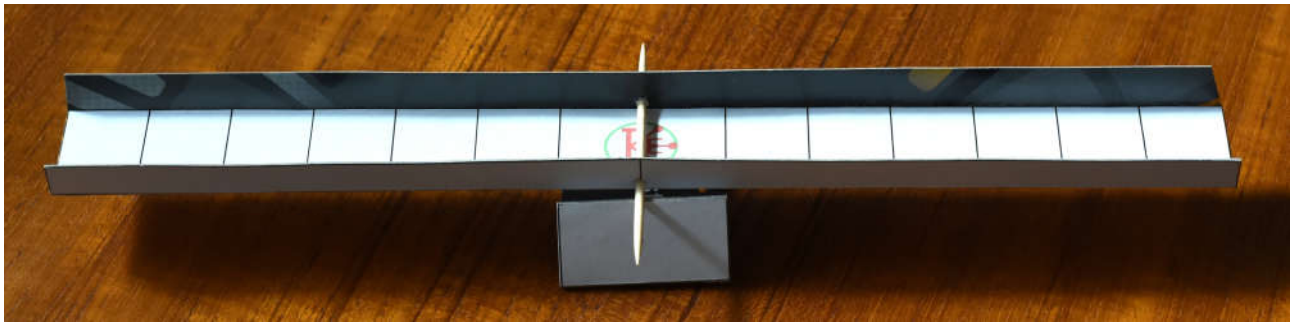
See-Saw.

When does a see-saw balance?
This is a description of a simple arrangement that can be used to investigate when a see-saw will balance.



Equipment

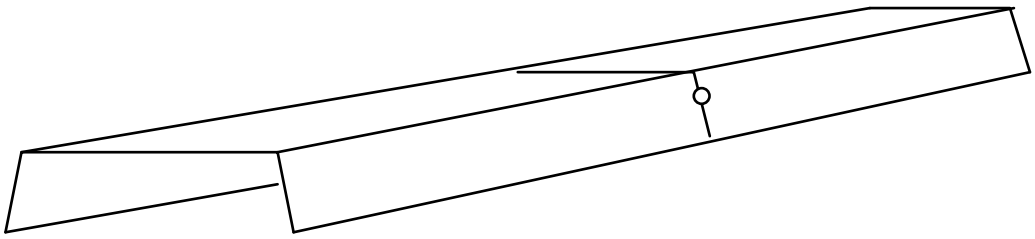
A4 sheet of card (e.g. a breakfast cereal box)
Pritt-Stick type glue
Cocktail stick
Scissors
Some 1p coins

Risks

Paper cuts
Cuts when scoring lines
Stab injuries from cocktail sticks

Construction of see-saw

1). Cut out the see-saw template and stick it onto card.
When dry, carefully cut around the template and card.
2). Score along the two long lines using scissors.
3). Using a ruler and the table edge as guides, bend the sides of the see-saw down.



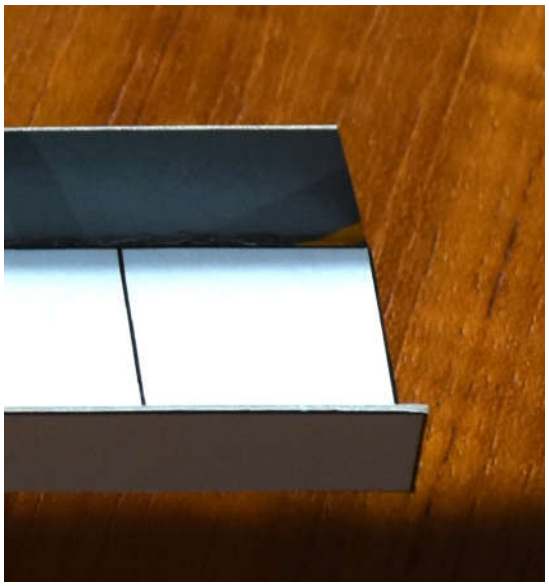
4). Carefully cut out the scale.
Turn the see-saw over and stick the scale to the inside.
5). Very carefully make holes in the side of the see-saw with a sharp point (e.g. pencil) where indicated. Ensure that you do not stab your finger.
Carefully push the cocktail stick through the holes across the see-saw.
6). Cut out the support template and stick it onto card.
When dry, carefully cut around the template and card.
Score along all of the lines using scissors.

7). Using a ruler and the table edge as guides, bend the cardboard down along each of the lines to form the shape below.

Glue the bottom sides of each triangle to the base.

8). At the top and middle of each triangle, make a small groove by rubbing the scissors across the top.

9). Place the see-saw onto the support so that the cocktail stick rests in the grooves.
If all is well, the see saw will balance.
If it does not, carefully cut a very small piece from the edge corner of the heavier side of the see-saw.
It is better to remove too little than too much, as you can always remove more later.



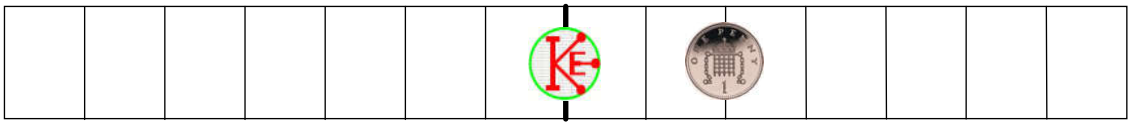
Investigations

What are the conditions for a see-saw to balance?

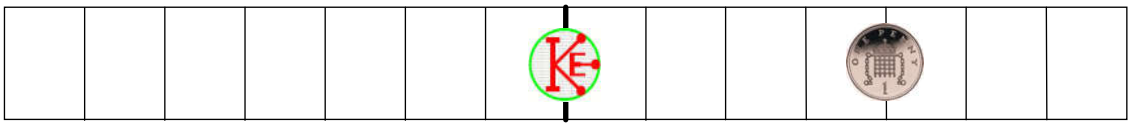
Care should be taken when putting the 1p coins onto the see saw because it is quite delicate. The end of a pencil may be helpful to gently push the coins into place.

1). Use the see-saw to find where a 1p coin should be placed to balance the following:-

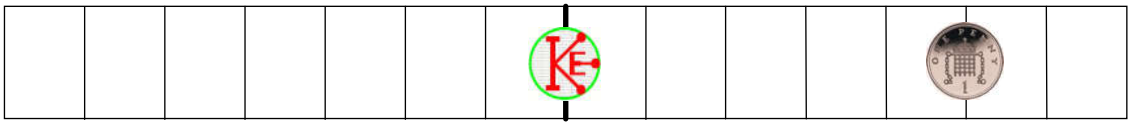
a).



b).



c).

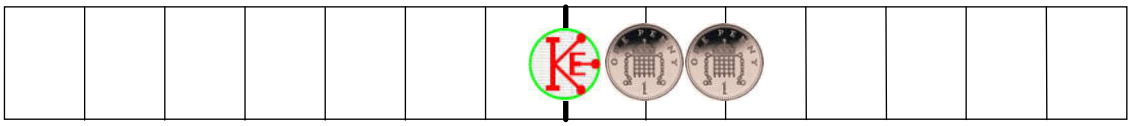


What is the general rule for this? ……

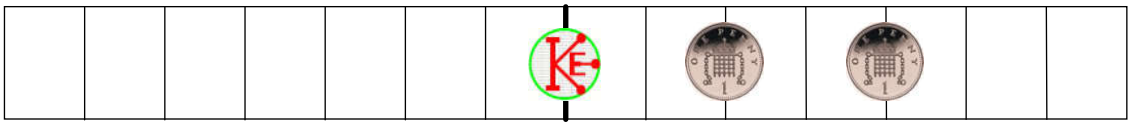
……

2). Use the see-saw to find where ONE 1p coin should be placed to balance the following:-

a).



b).

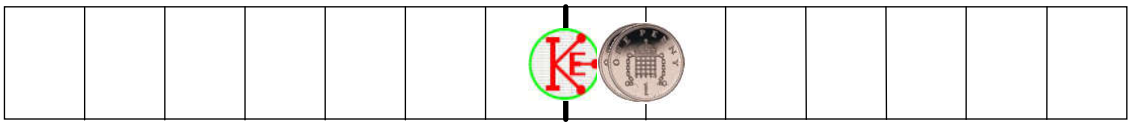


What is the general rule for this? ……

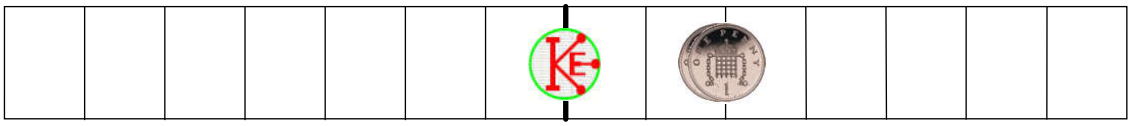
……

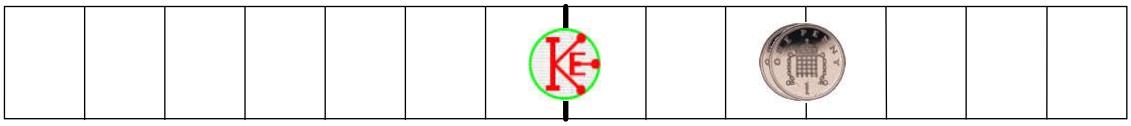
3). Use the see-saw to find where ONE 1p coin should be placed to balance the following:-

a).



b).

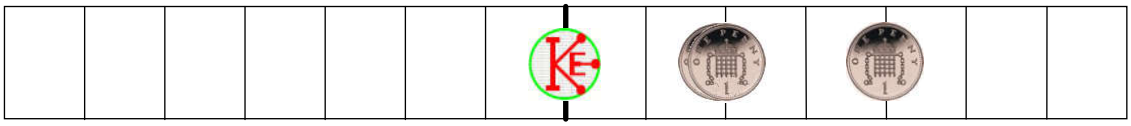


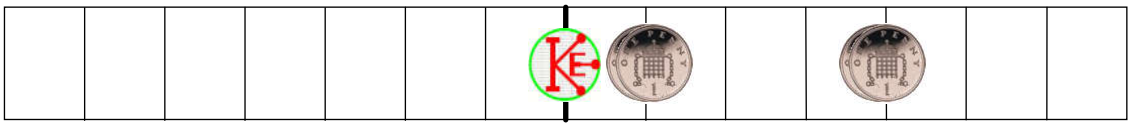
c). 

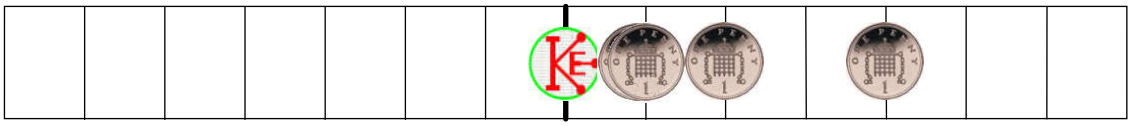
What is the general rule for this? ……

……

4). Use the see-saw to find where TWO 1p coin should be placed to balance the following:-

a). 

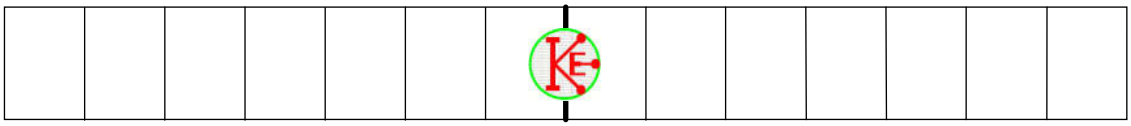
b). 

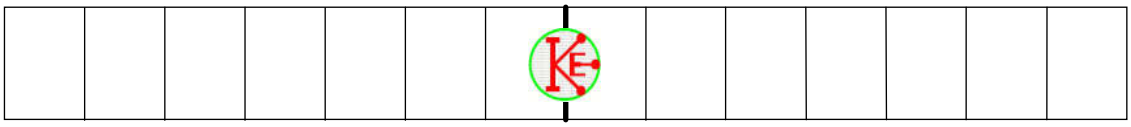
c). 

What is the general rule for this? ……

……

5). Try a few of your own and show what balances on the pictures below.

a). 

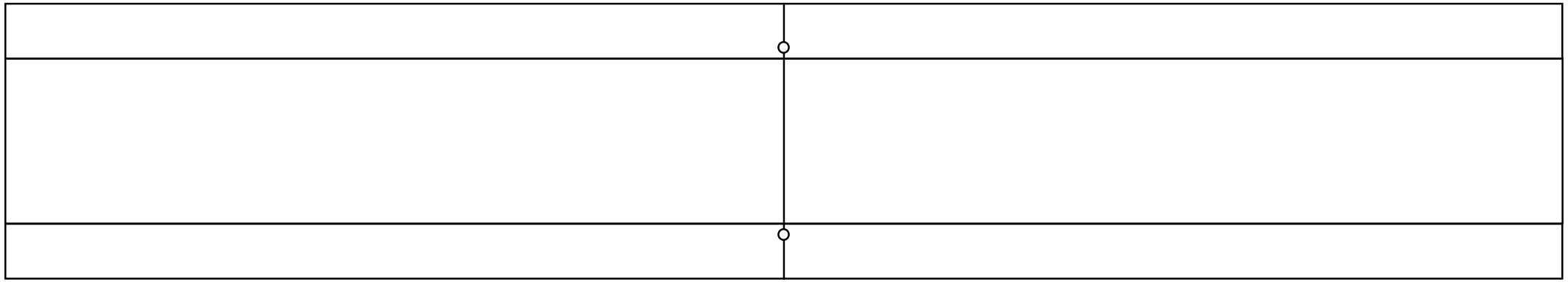
b). 

Explanation

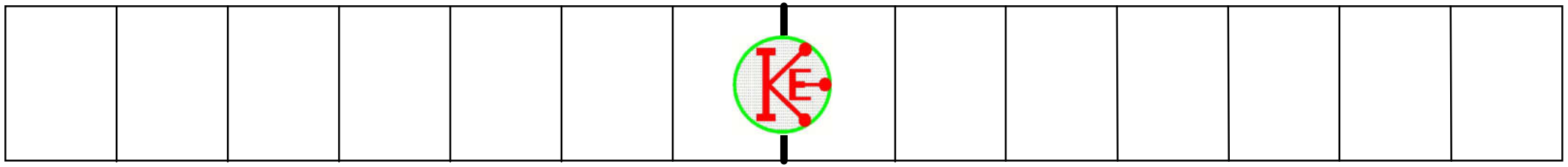
A see-saw balances when the turning effect on both sides is equal.
When a coin is placed onto one side of the see-saw, it tries to make the see-saw turn clockwise or anticlockwise.
The turning effect of the coin depends on the weight of the coin and how far it is from the support.
The scientific name for the turning effect of a force is the MOMENT of the force.
The moment of a force is equal to the force × distance from the support (pivot).
The see-saw balances when the sum of the moments turning the see-saw clockwise is equal to the sum of the moments turning the see-saw anticlockwise.

TEMPLATES

See-Saw



Scale



Support