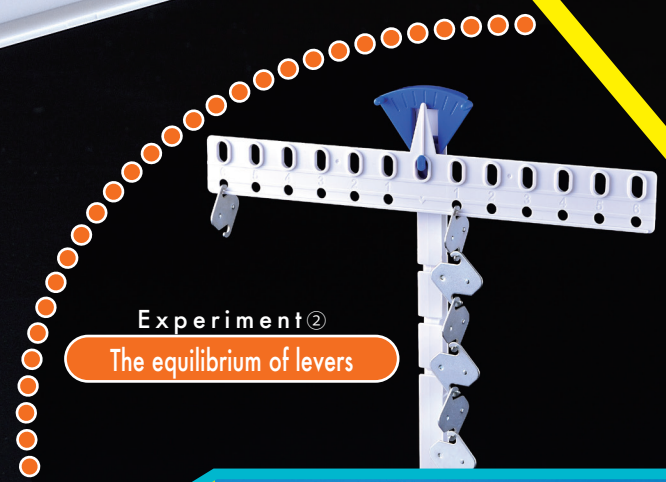
SCIENCE TEACHING MATERIALS

The principles of levers [TypeA]

Fully compliant with latest textbooks

Experiment①
How levers works

Experiment②
The equilibrium of levers

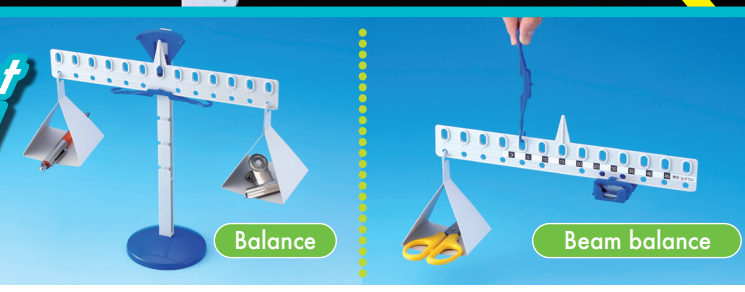


Let's play the wobble game!

Contents

* Before the experiment, make sure that contents are inside

Abundant and Practical Curriculum

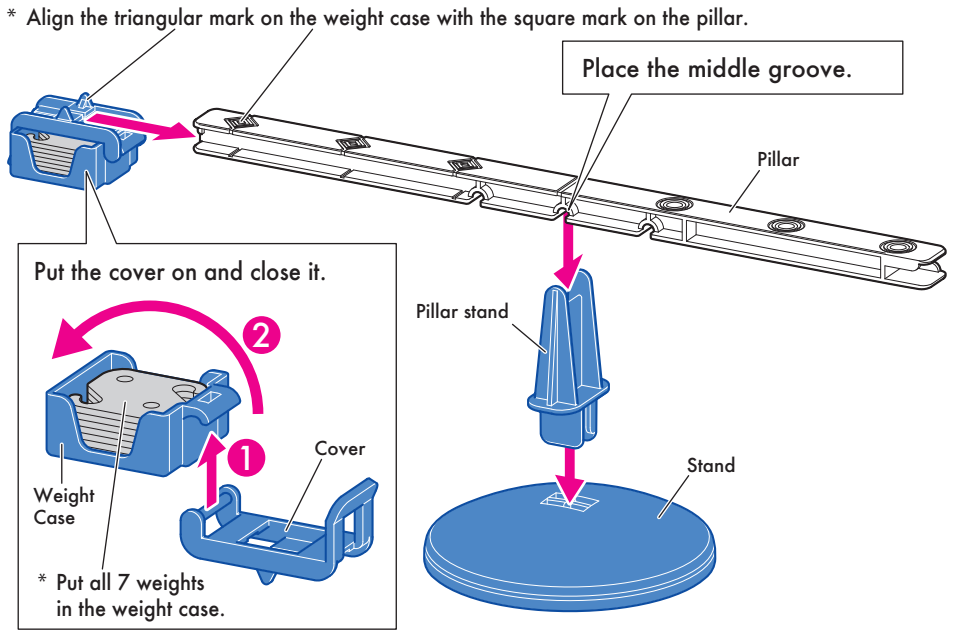


Name　　Year　　Class

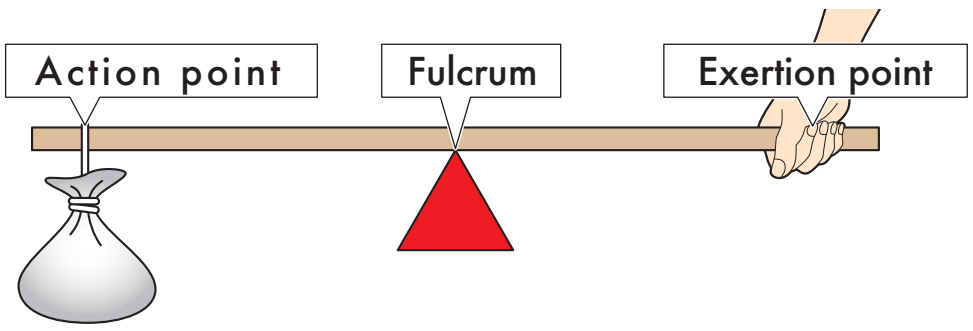
Caution
- Please do not put the plastic bag over your head.
- Please do not put weights or other small parts in your mouth.
- Please do not throw weights or shake them around in the bag.
- When cutting out parts or mounts, use scissors or cutter knives carefully.
- Be sure to read the instructions carefully before conducting the experiment.
- After the experiment is over, please store the materials in the bag.

Set-up A Assembling the lever A

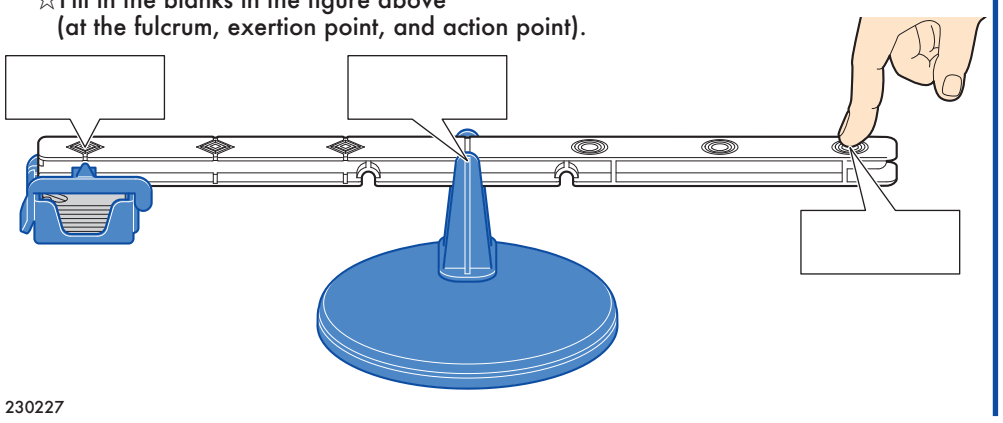
* Align the triangular mark on the weight case with the square mark on the pillar.



Name of each lever



☆Fill in the blanks in the figure above (at the fulcrum, exertion point, and action point).



230227

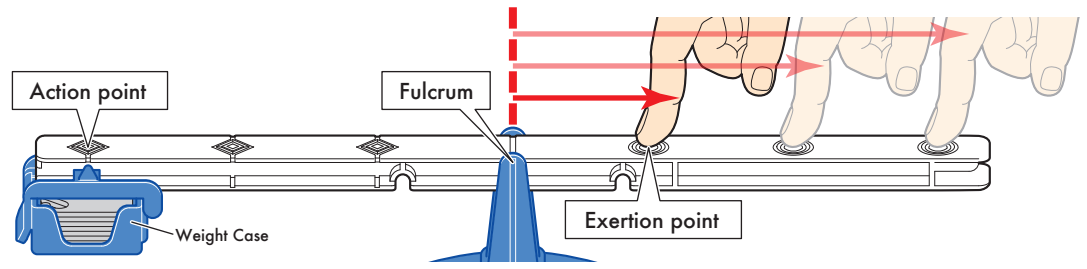
Let's find out how a lever works

Experiment 1

How a lever works　Use lever A

❶ Without changing the point of action (adjust the weight case to the position shown in the figure), change the point of force (the position supported by the fingers) and examine how much force is exerted.

Change・・・Position of the point of force　　Do not change・・・Position of fulcrum and action point

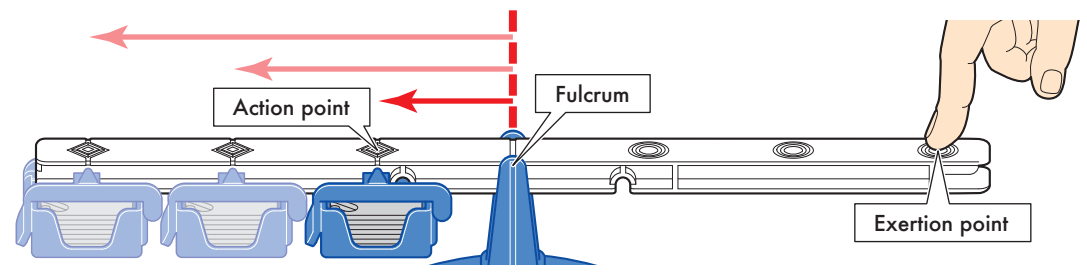


☆Please circle either "big" or "small" in the table on the right.

Distance from fulcrum to force point	Short	Long
Force	Big・Small	Big・Small

❷ Without changing the force point (supporting the position shown in the figure with your finger), change the action point (position of the weight case) and examine how much the force is exerted.

Change・・・Position of the point of action　　Do not change・・・Position of fulcrum and force point



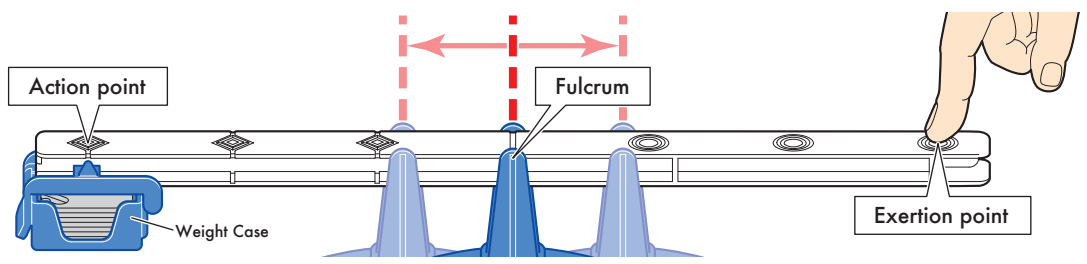
☆Please circle either "big" or "small" in the table on the right.

Distance from fulcrum to force point	Short	Long
Force	Big・Small	Big・Small

Let's Try

●Without changing the point of action and the point of force, change the position of the fulcrum and let's see what happens.

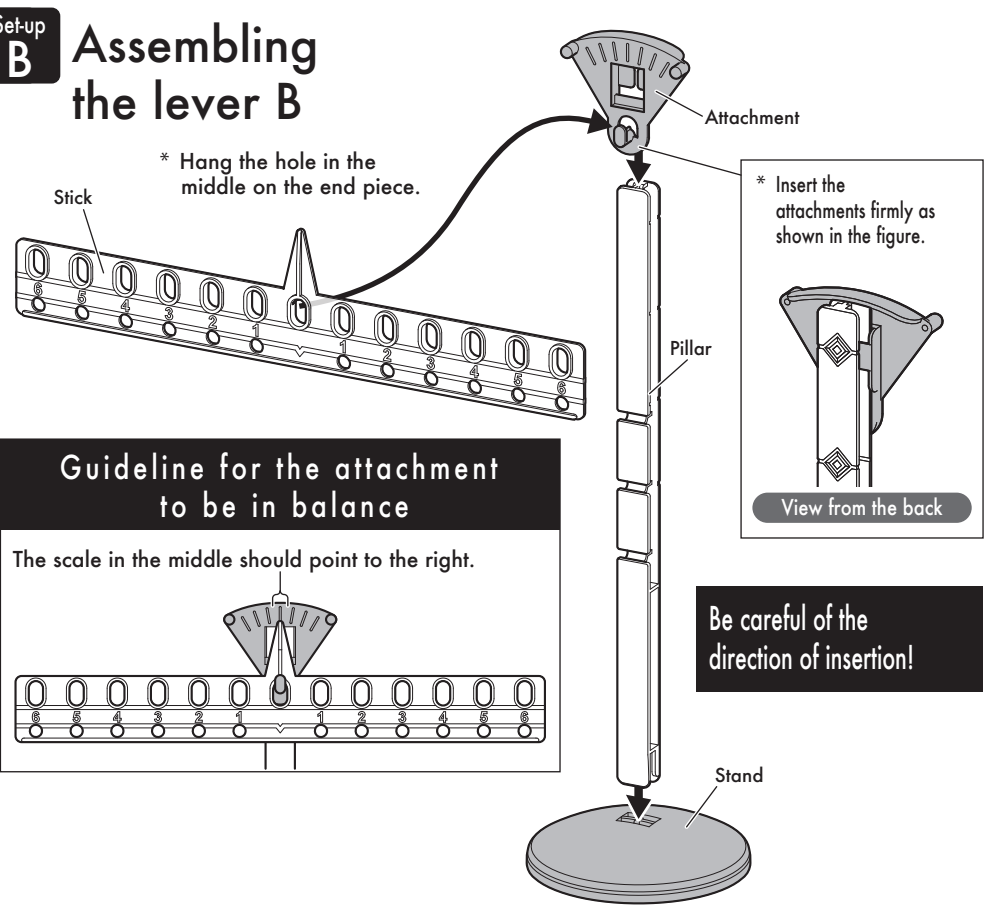
Change・・・Position of fulcrum　　Do not change・・・Position of force point and action point



☆Think about the results of the above experiment and summarise your findings.

Set-up B

Assembling the lever B



Guideline for the attachment to be in balance

The scale in the middle should point to the right.

Be careful of the direction of insertion!

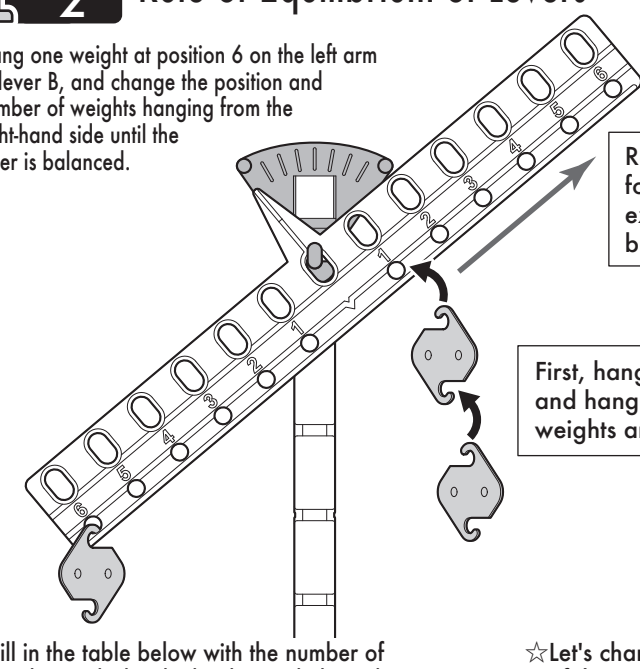
How does the lever balance?

Experiment 2

Rule of Equilibrium of Levers

Using Lever B

- Hang one weight at position 6 on the left arm of lever B, and change the position and number of weights hanging from the right-hand side until the lever is balanced.



Repeat the previous steps for positions 1 through 6, examine how the weights balance each other.

First, hang one weight at position 1 and hang it downward until the weights are in balance.

☆Fill in the table below with the number of weights used when both sides are balanced.

(If the weights do not balance, write an X)

Left arm		Right arm	
Number of weights	Position of the weights (distance from the fulcrum)	Number of weights	Position of the weights (distance from the fulcrum)
1	6		1
			2
			3
			4
			5
			6

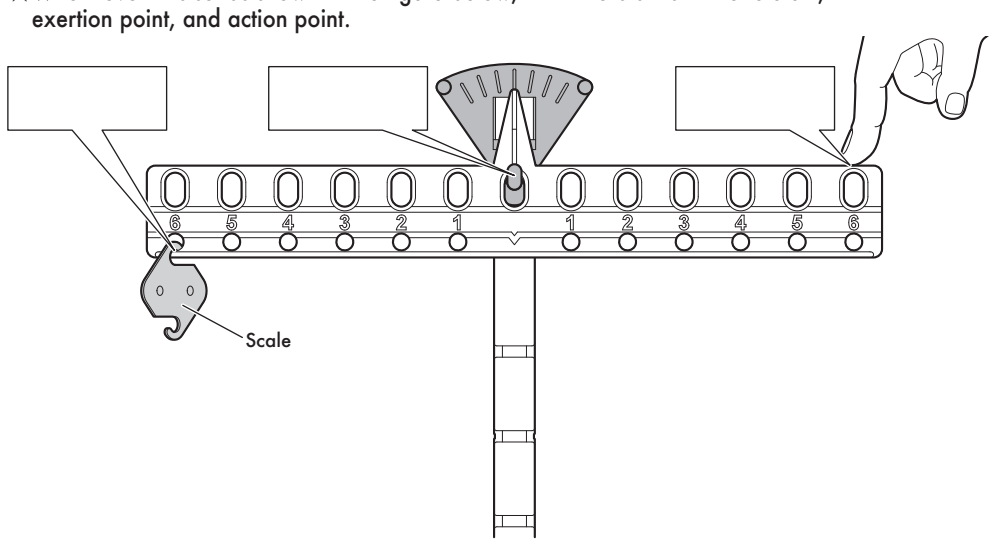
☆Let's change the number and position of the weights on the left-hand side and check again.

Left arm		Right arm	
Number of weights	Position of the weights (distance from the fulcrum)	Number of weights	Position of the weights (distance from the fulcrum)
			1
			2
			3
			4
			5
			6

☆Take the numbers that led to a balanced lever from the table above and write your answers in the boxes below.

Left arm × ☐ = Right arm × ☐

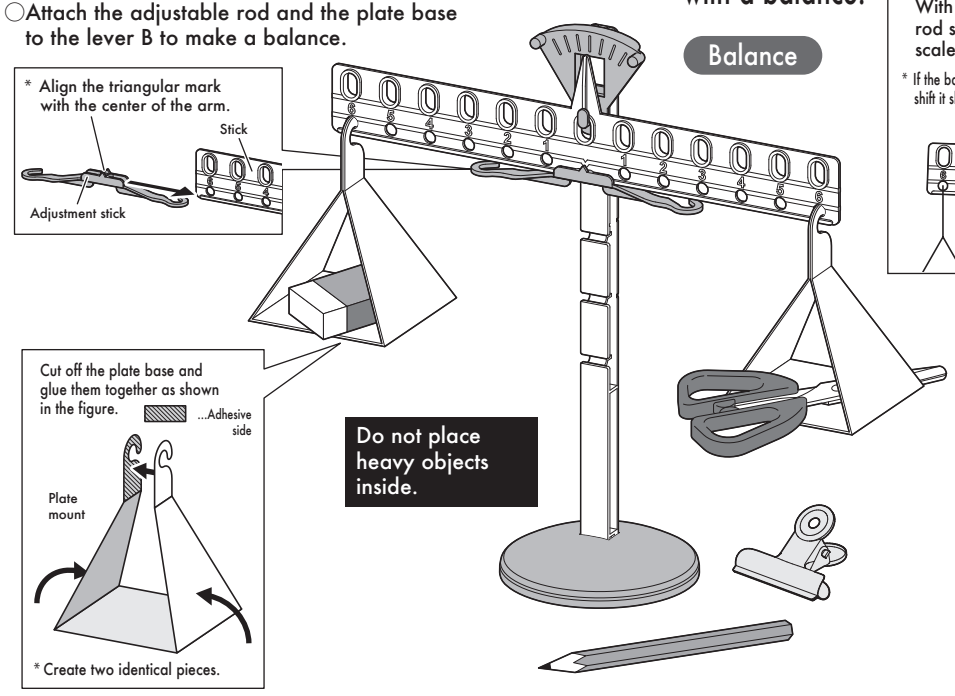
☆When lever B is set as shown in the figure below, fill in the blanks in the fulcrum, exertion point, and action point.



Let's Try

① Let's compare the weights of things around us with a balance!

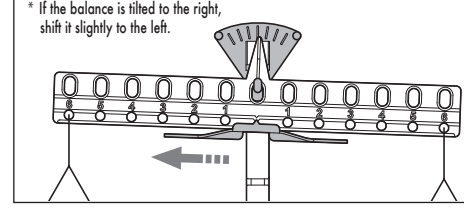
○Attach the adjustable rod and the plate base to the lever B to make a balance.



How to adjust the balance

With nothing on both sides, shift the adjusting rod slightly in the opposite direction until the scale is balanced.

* If the balance is tilted to the right, shift it slightly to the left.



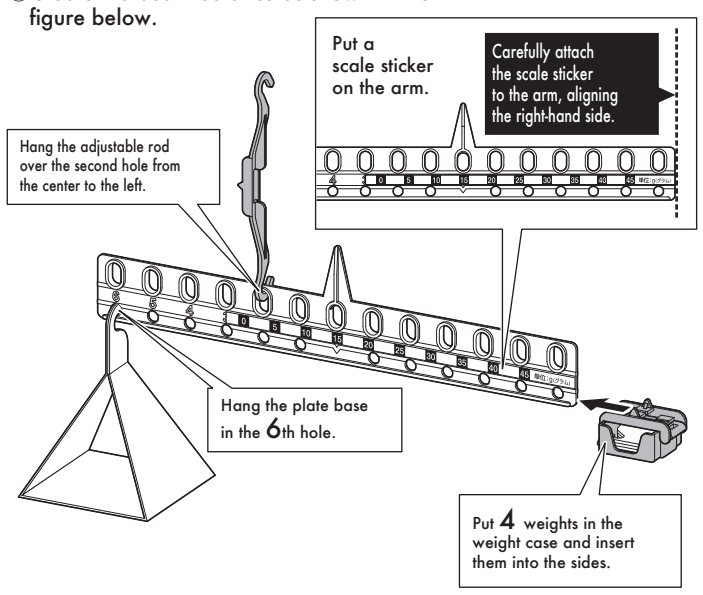
☆Write down the various things around you in the table below and indicate which are the heavier items.

Left plate		Right plate	

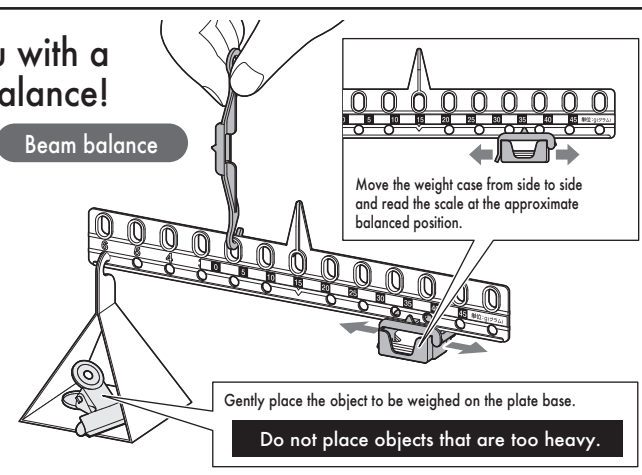
Let's Try

② Weigh the things around you with a beam balance!

○Create the beam balance as shown in the figure below.



Beam balance

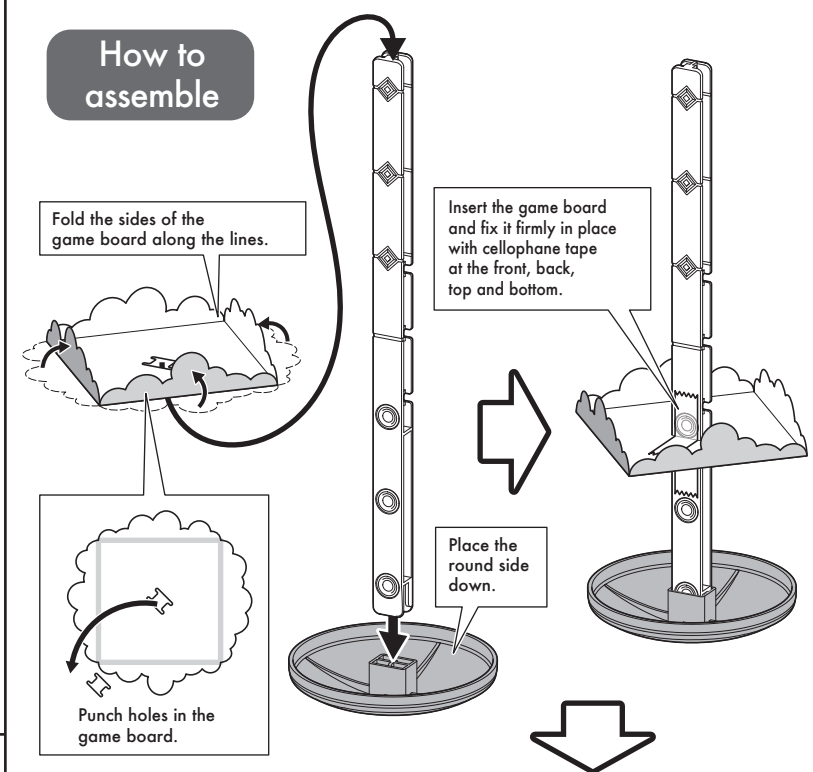


☆Weigh various objects around you and write the weights in the table below.

Things around	Weight(g)	Things around	Weight(g)

Let's play the wobble game!

How to assemble



How to play