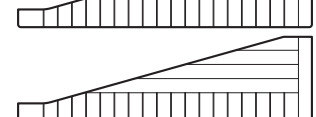


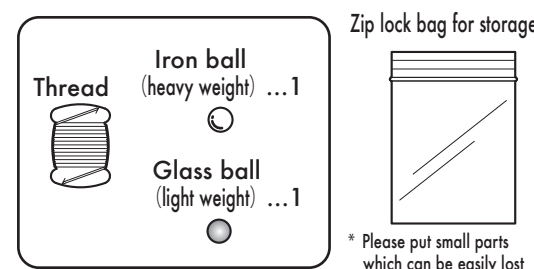
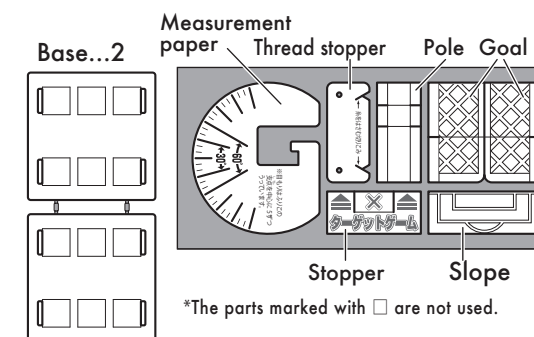
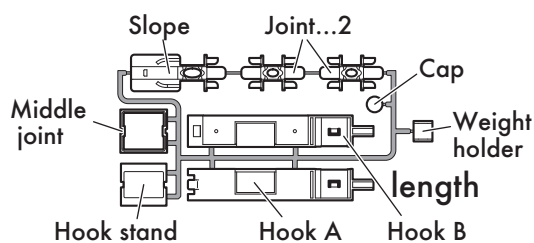
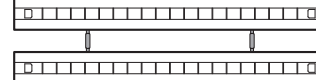
# Pendulum [Type F]

## Contents

Board...2



Rail...2



## Items to prepare

stopwatch, cellophane tape, scissor



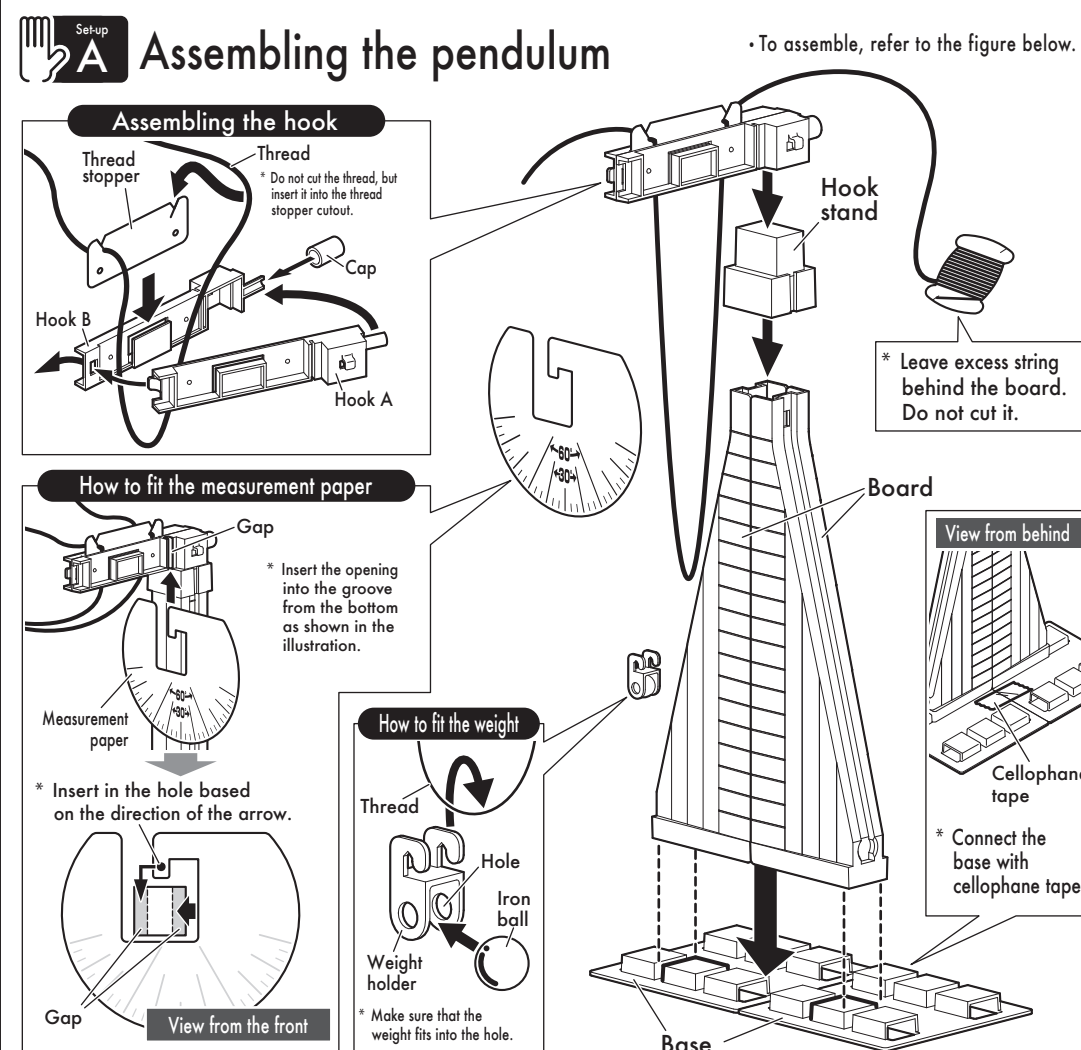
- Do not put balls or other small objects in the mouth to prevent accidental swallowing.
- Do not throw the balls or swing the weights with string attached.
- When using tools such as scissors, listen carefully to the teacher's instructions before using them.
- Please read the instruction manual carefully before conducting experiments.

Name

Year

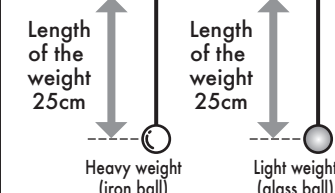
Class

How does the pendulum move?



## Experiment 2 Weight

1 Using the same weighing method in Experiment 1, determine the time required for a heavy weight (iron ball) and a light weight (glass ball) to make one round trip of the pendulum.



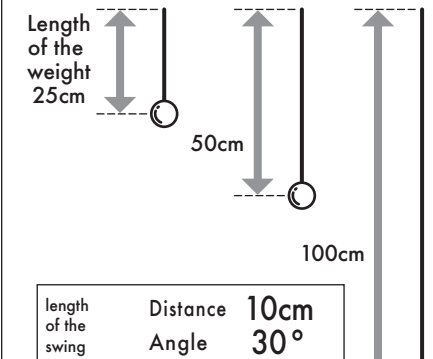
length of the swing Distance 10cm Angle 30°

\* The results of the experiment with the heavy weight (iron ball) can be used as a reference for the results of Experiment 1.

Weight	Time to make 10 round trips (seconds)				Time to make 1 round trip (seconds)
	1 <sup>st</sup> Trip	2 <sup>nd</sup> Trip	3 <sup>rd</sup> Trip	per Trip	
Heavy weight (iron ball)	(seconds)	(seconds)	(seconds)	(seconds)	(seconds)
Light weight (glass ball)	(seconds)	(seconds)	(seconds)	(seconds)	(seconds)

## Experiment 3 Length of the weight

1 Using the same weighing method as in Experiment 1, determine the time required to make one round trip for each of the three lengths (25 cm, 50 cm, and 100 cm) of the pendulum.



\* You may refer to the results of Experiment 1 for the 25 cm length.

Length of pendulum	Time to make 10 round trips (seconds)				Time to make 1 round trip (seconds)
	1 <sup>st</sup> Trip	2 <sup>nd</sup> Trip	3 <sup>rd</sup> Trip	per Trip	
25cm	(seconds)	(seconds)	(seconds)	(seconds)	(seconds)
50cm	(seconds)	(seconds)	(seconds)	(seconds)	(seconds)
100cm	(seconds)	(seconds)	(seconds)	(seconds)	(seconds)

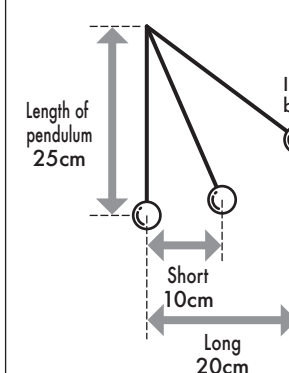
## Experiment 1 Length of the pendulum

1 Shake the pendulum and see how it swings.  
2 Compare the time (in seconds) it takes to make one round trip when the amplitude of the pendulum is small and when it is large.

\* Experiment with either distance or angle.

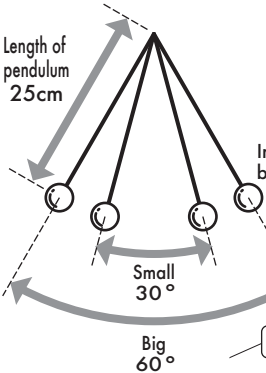
Calculate the distance travelled

\* Use the scale below.



Measure by angle.

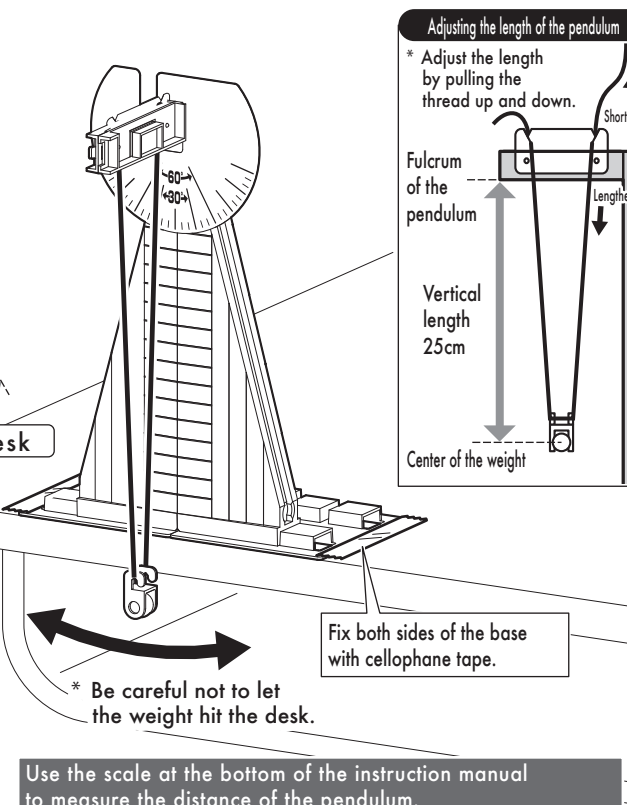
\* Use the measurement paper



Length of the pendulum	Time to make 10 round trips (seconds)				Time to make 1 round trip (seconds)
	1 <sup>st</sup> Trip	2 <sup>nd</sup> Trip	3 <sup>rd</sup> Trip	per Trip	
Short	(seconds)	(seconds)	(seconds)	(seconds)	(seconds)
Long	(seconds)	(seconds)	(seconds)	(seconds)	(seconds)

3 Measure the time for the pendulum to make 10 round trips 3 times, and calculate the time for one round trip (in seconds).

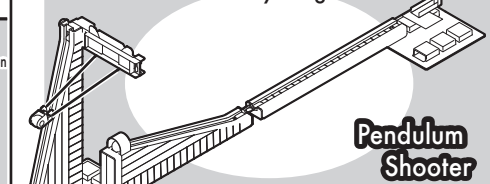
Calculation method	* Round off to the second decimal place.
Total time (3 rounds) ÷ 3 =	Time per 10 round trips (seconds)
Time for 10 round trips ÷ 10 =	Time per round trip (seconds)



## You can play various games using the weights

Create your favorite game!

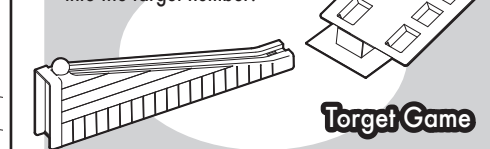
Aim the pendulum at the iron ball to reach your goal!



Aim for a high score and don't let the keeper stop you!



Put the iron ball or glass ball into the target number!



Instructions for the games are on the back of the box.

230224F.S

