

The Education University of Hong Kong

2021-2022 Quality Education Fund Thematic Network – Tertiary Institutes

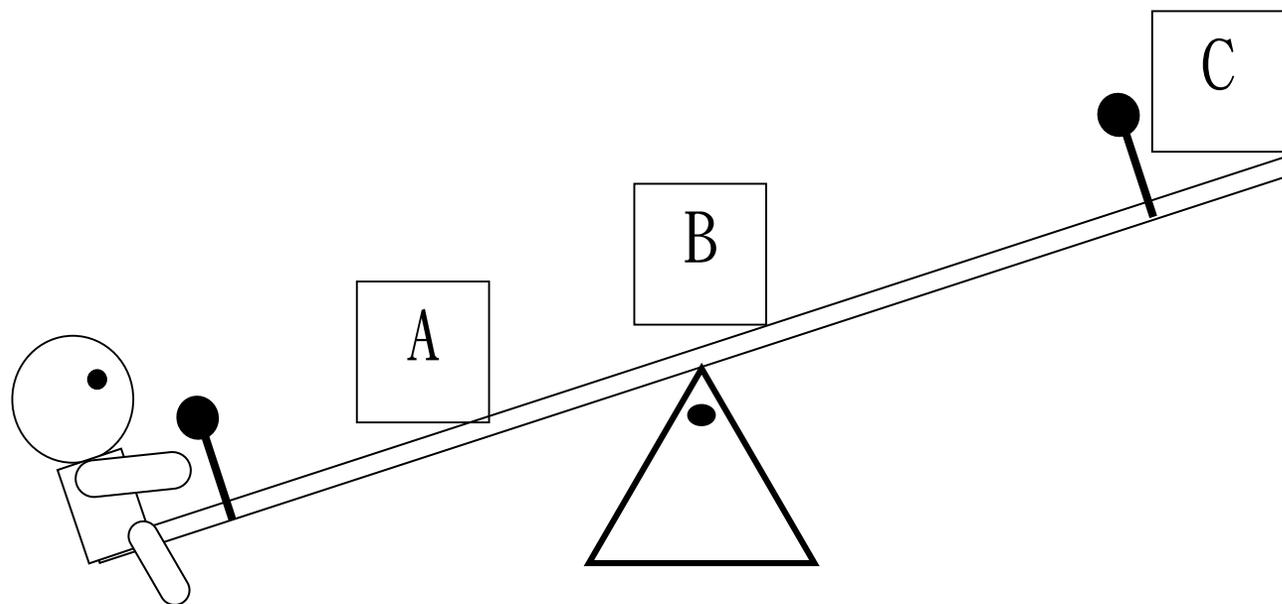
STEM Project Team

SCHOOL: HO SHUN PRIMARY SCHOOL (SPONSORED BY
SIK SIKYUEN) (P6)

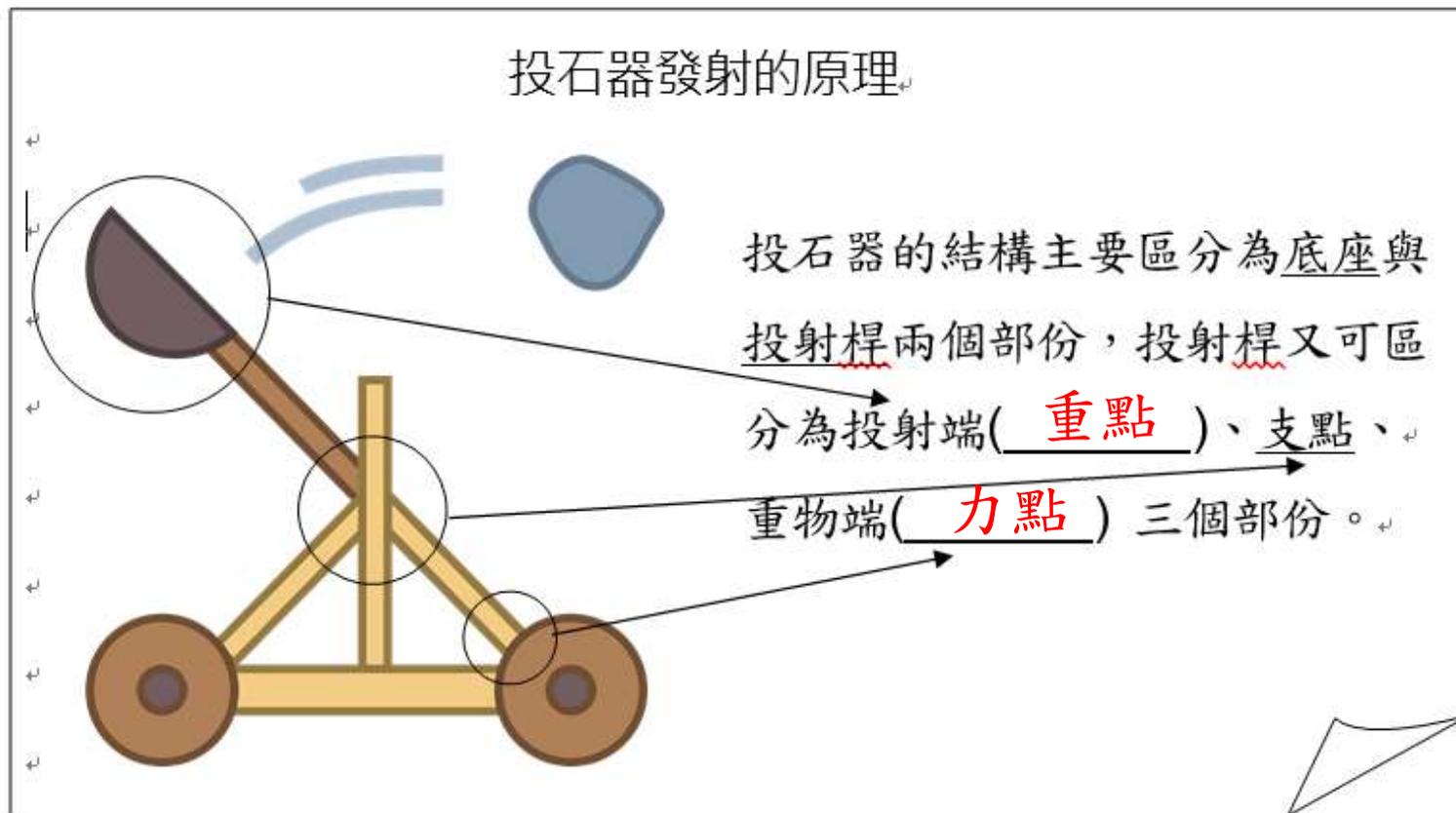
TOPIC: CATAPULT WITH AUTOMATIC SCORING SYSTEM

槓桿原理

要將圖中的小朋友向上升，應該要坐在哪裏？
(A / B / C)



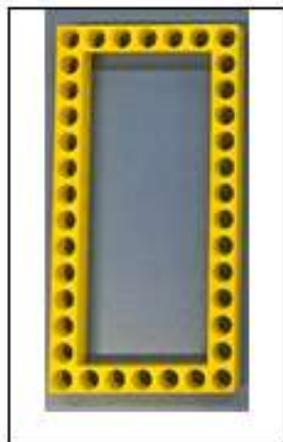
投石器運用了槓桿原理，根據右圖，認識投石器發射的原理。



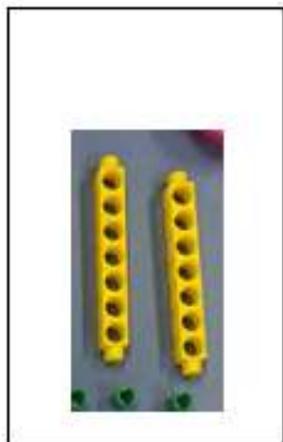
投石器 材料和工具：

Assemble Catapult 組裝投
石器模型

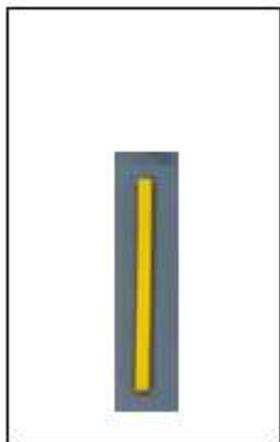
<https://www.youtube.com/watch?app=desktop&v=Bn8y5Nn6YGE&feature=youtu.be>



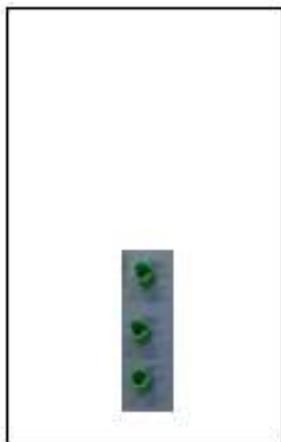
活動框(1 個)



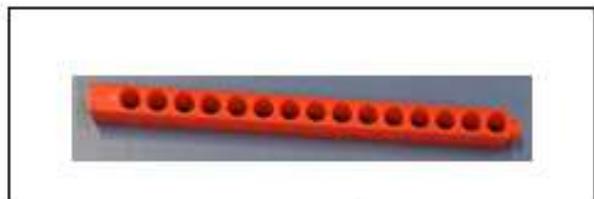
短立柱(2 條)



小軸(1 條)



活軸(3 個)



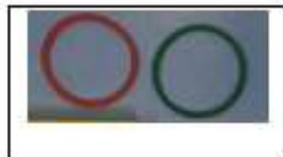
長立柱(1 條)



托盤(1 個)



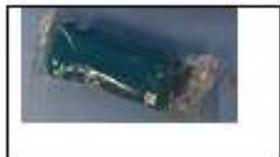
平扣(2 個)



橡筋(2 條)



固定支架(2 個)



橡皮泥(1 塊)

投石器



o1Test_Video

學生探索(一) 投擲距離

- 第一類槓桿—支點在重點和力點之間；如果力臂較重臂長，在搬動重物時可較為省力？

槓桿原理？

測試項目	投射桿支點和重點的距離 (力和支點的距離：3 個圓孔)	砲彈的距離 (cm)
1	3 個圓孔	~76 cm
2	6 個圓孔	~80 cm
3	9 個圓孔	~37 cm



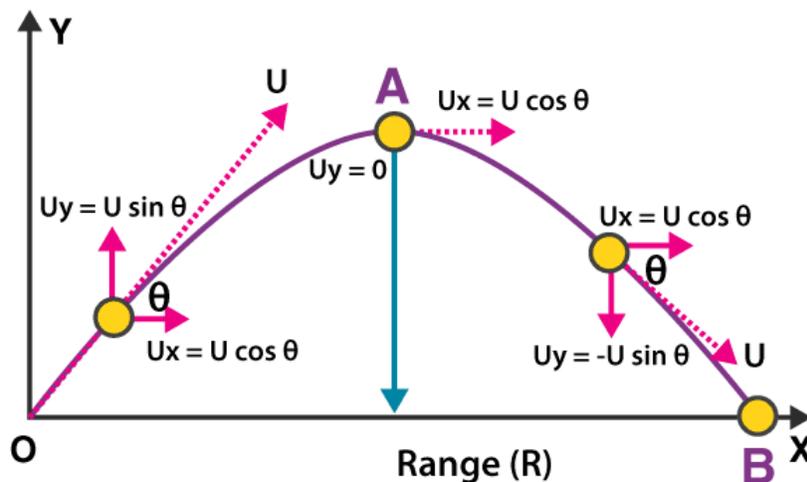
*總共15個圓孔



拋物線運動 (Projectile motion)

PROJECTILE MOTION

BYJU'S
The Learning App



© Byjus.com

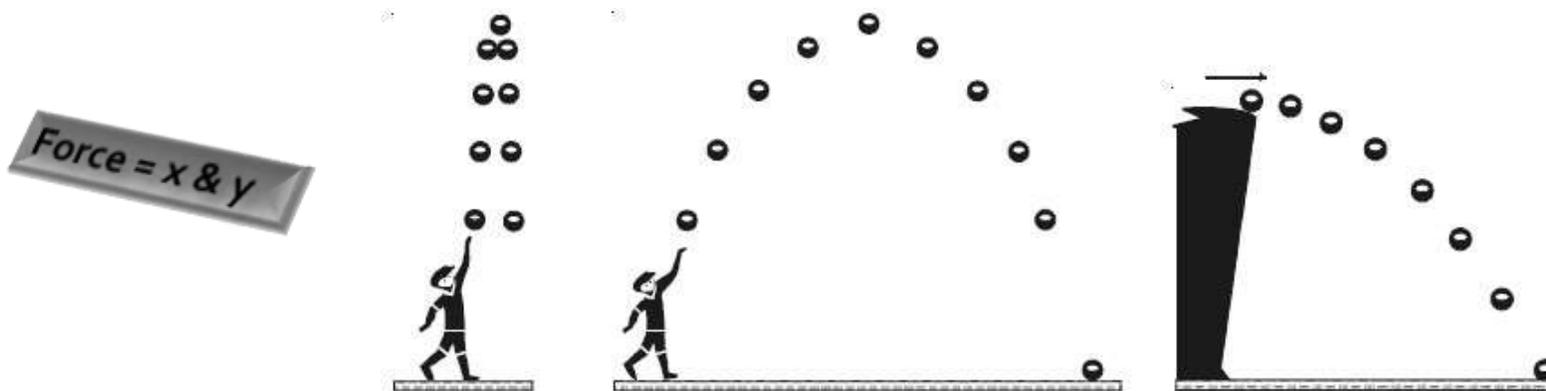
$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

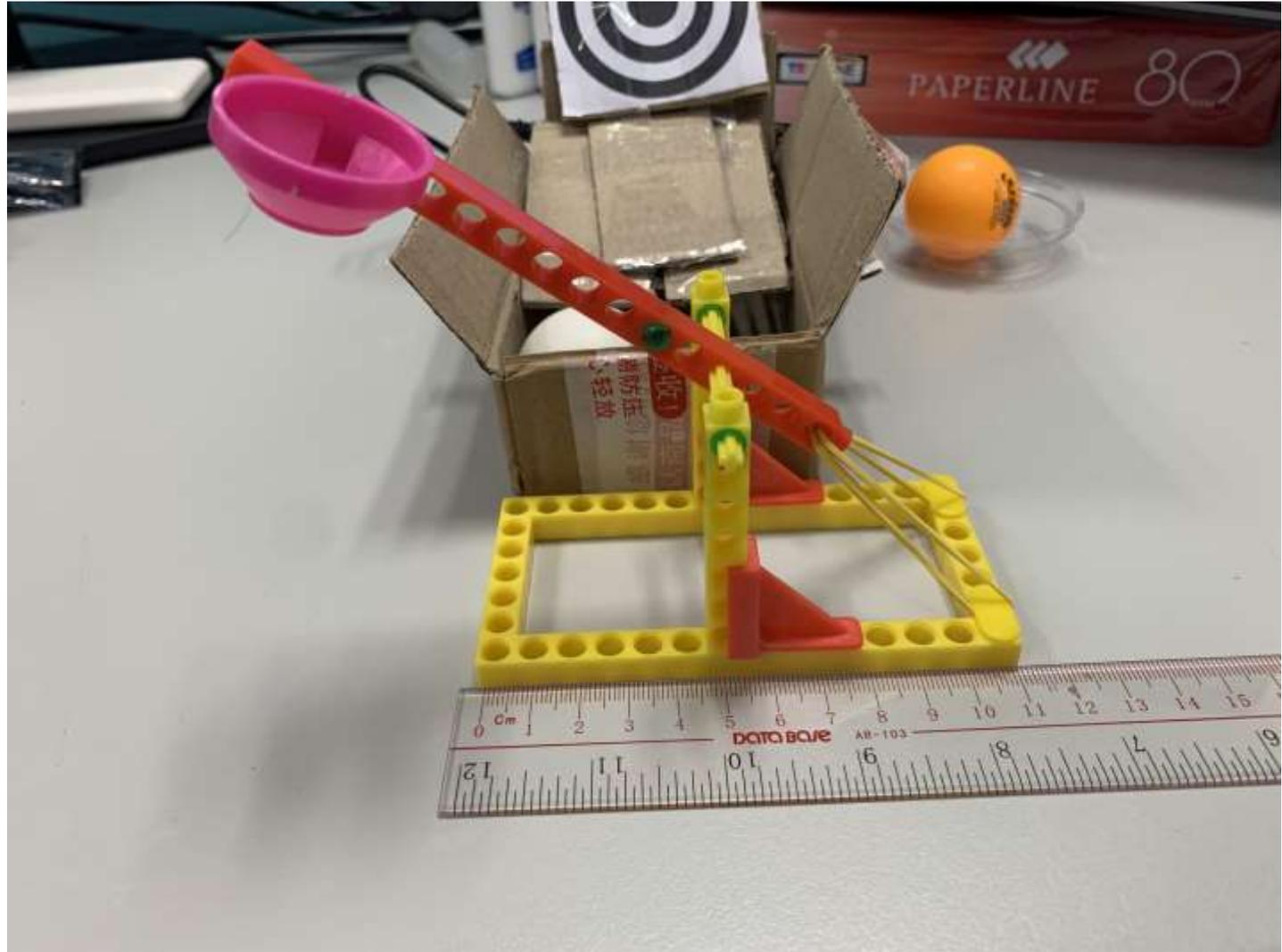
$$s = \frac{1}{2}(u + v)t$$

S4 Physic (Force and motions)

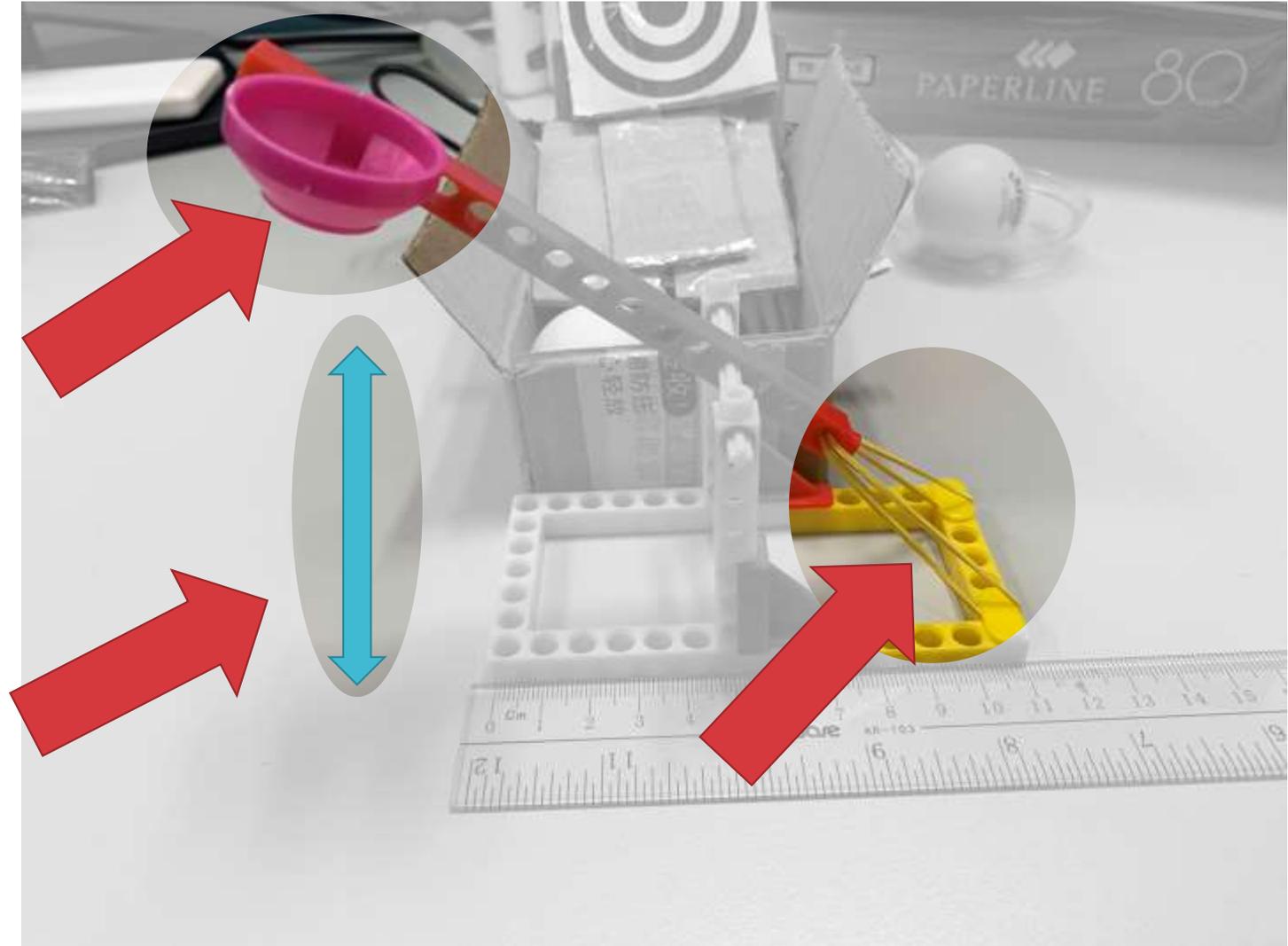


Different types of projectiles

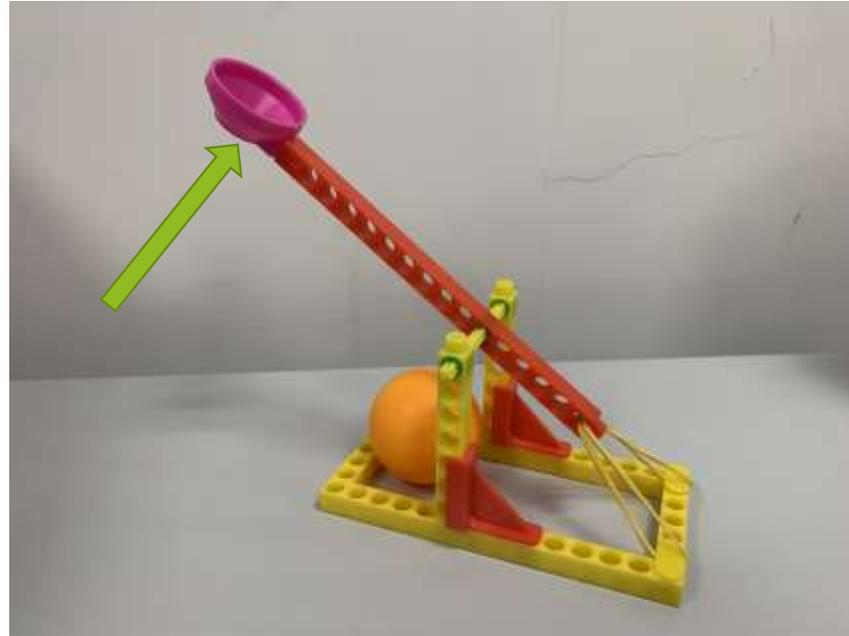
主要影響因素



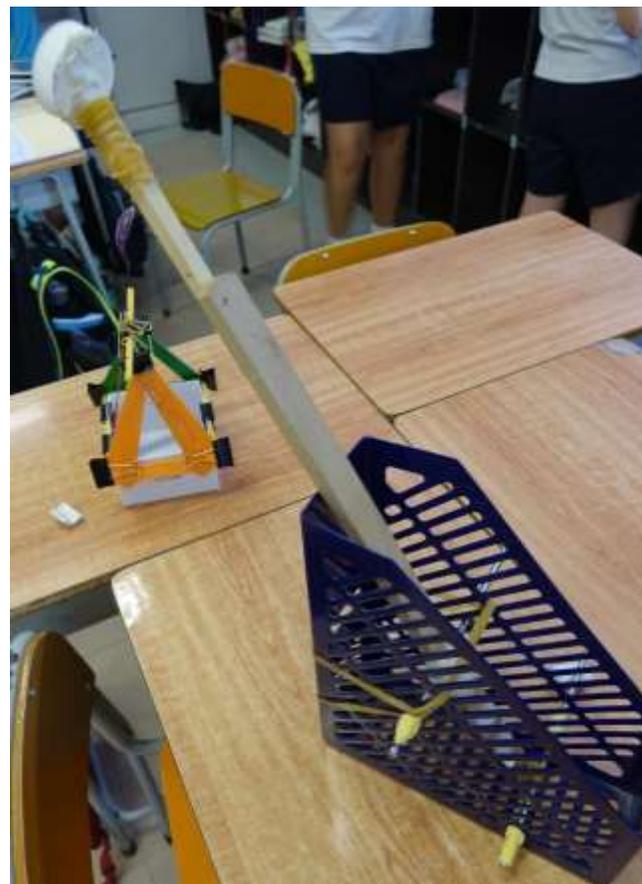
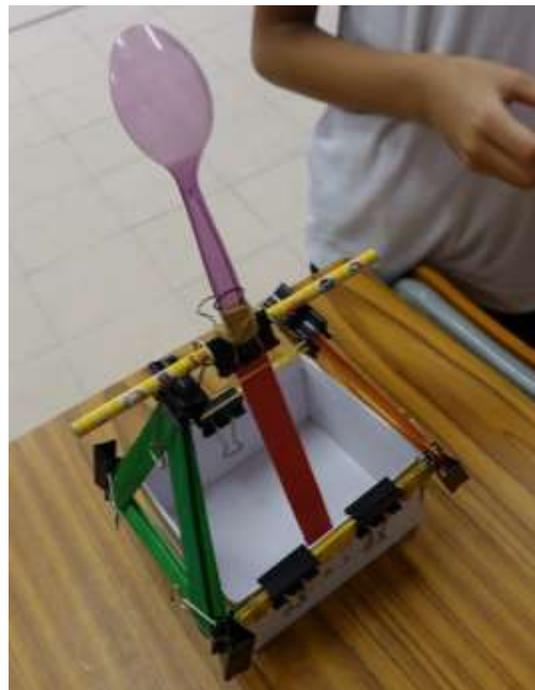
主要影響因素



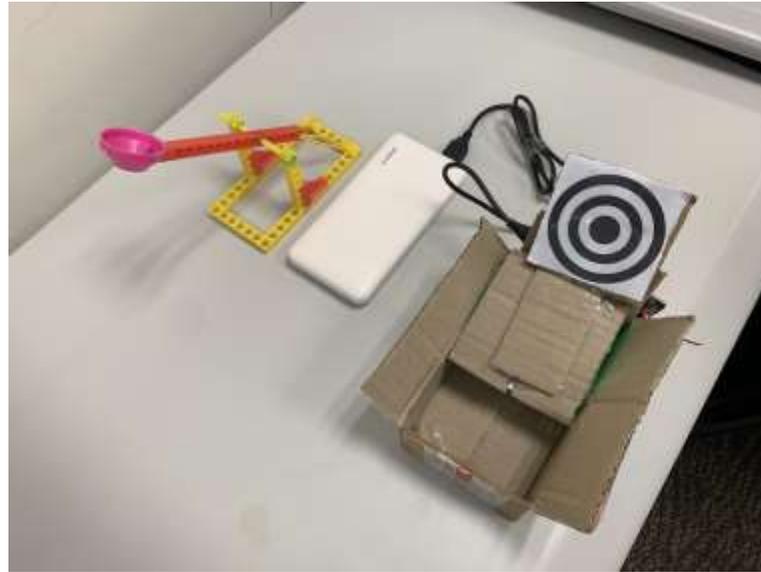
學生探索(二) 投石器設計



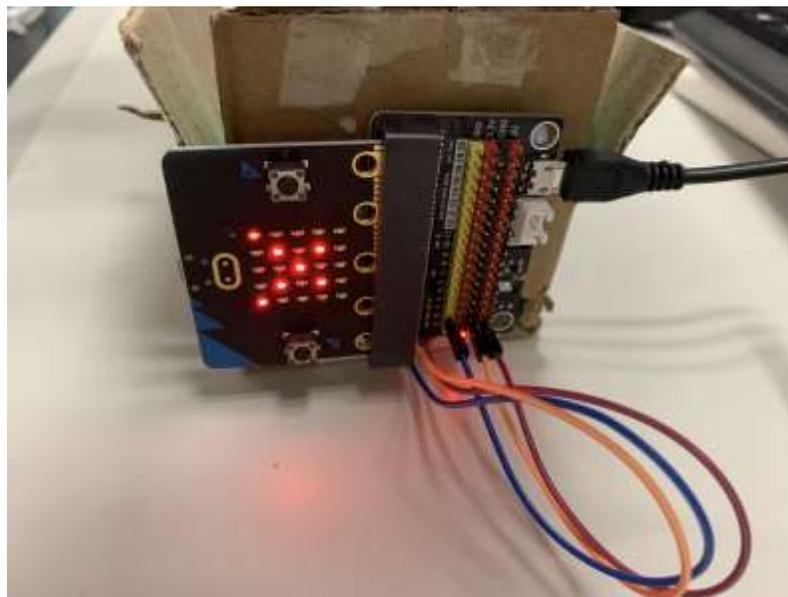
學生探索(三) DIY投石器



計分裝置



計分裝置(一) IR sensor

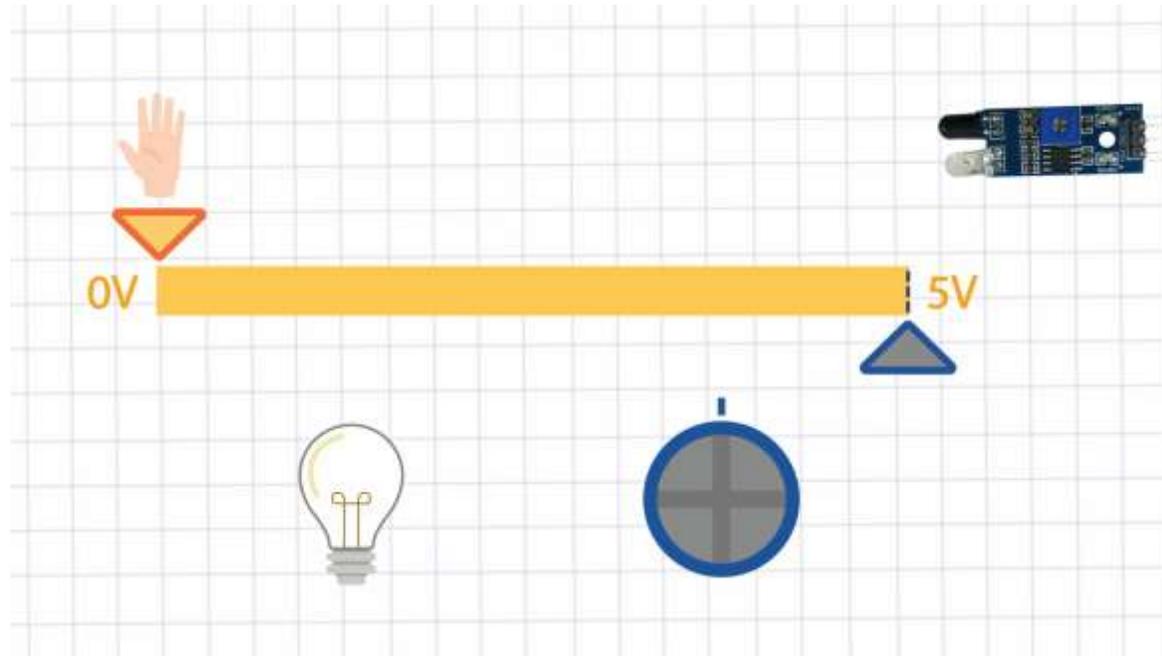


o2IRTest_Video

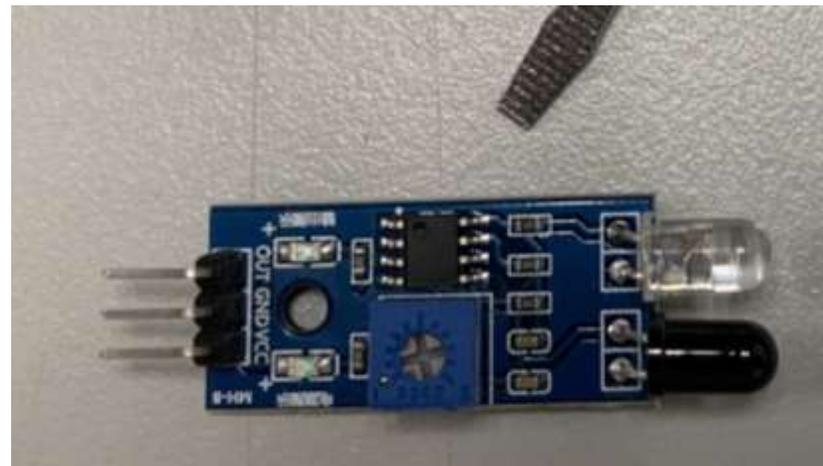
Coding

The screenshot displays the Microsoft MakeCode micro:bit IDE interface. At the top, the Microsoft logo and 'micro:bit' are visible. The interface is split into three main sections: a visual representation of the micro:bit board on the left, a block palette in the center, and a code editor on the right. The code editor shows a 'forever' loop containing an 'if' statement. The 'if' statement checks if 'digital read pin P0' is equal to '0'. If true, it triggers a sequence of actions: 'show icon' (a 3x3 grid), 'pause (ms)' (1000), and 'start melody' (entertainer, repeating once). If false, it triggers another 'show icon' block. The block palette on the left lists categories such as Basic, Input, Music, Led, Radio, Loops, Logic, Variables, Math, and Advanced. The background of the IDE features a faint pattern of micro:bit icons.

IR sensor

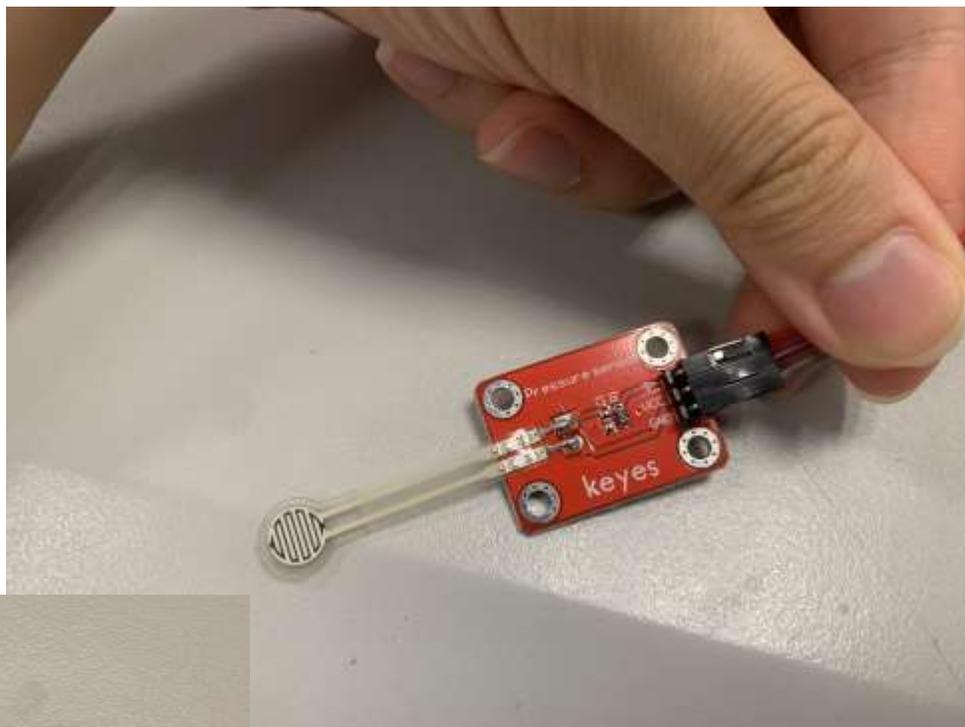


03IRSensor_Video



04Good_Video

計分裝置(二) Pressure sensor (KE0117 / KE2055)



05Pressure_Video1

Coding

The screenshot displays the Microsoft MakeCode micro:bit IDE interface. On the left, a virtual micro:bit board is shown with a USB cable connected. The central panel features a search bar and a categorized block palette with the following items: Basic, Input, Music, Led, Radio, Loops, Logic, Variables, Math, Advanced, Functions, Arrays, Text, and Game. On the right, the code editor contains a 'forever' loop block. Inside the loop, there is an 'if' block with the condition 'digital read pin P0 = 1'. The 'if' block has two branches: a 'then' branch containing a 'show icon' block (with a 3x3 grid icon), a 'pause (ms) 1000' block, and a 'start melody' block (with 'dadadum' and 'repeating once' settings); and an 'else' branch containing a 'show icon' block (with a 2x2 grid icon).

More about Pressure Sensor



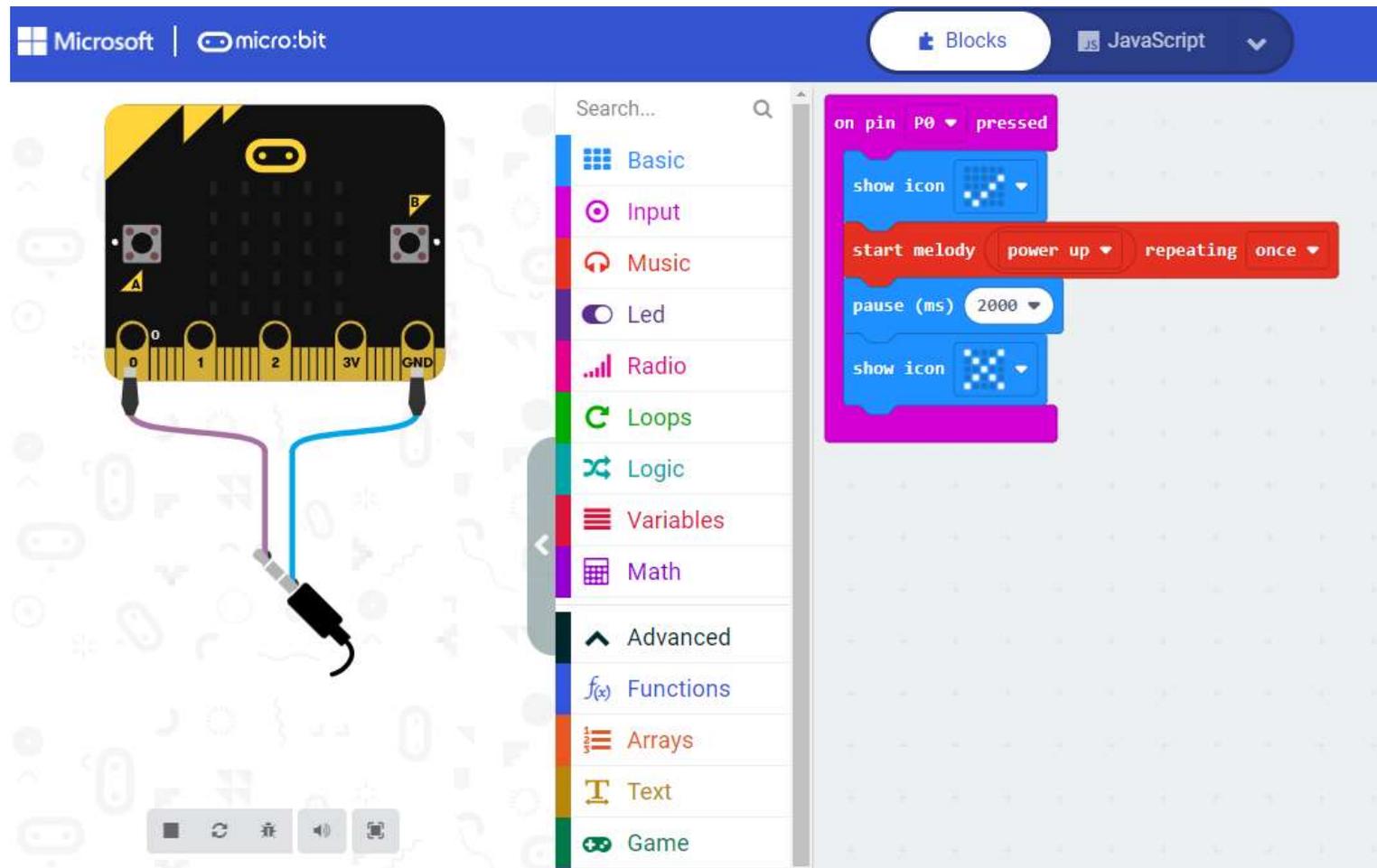
o6Pressure_Video2

計分裝置(三) Closed Circle



o7ClosedCircle_Video

Coding



學生探索(四) 計分裝置比較

