

Confucian Tai Shing Primary School

2021-2022 Second term

P2 STEM

School-based curriculum

Homemade parachute (自製降落傘)

exploring activity



P.2 J

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1. Review (重溫) the principle (原理) of parachutes

Learning focus :

1. Get to know the parachutes
2. Learn about gravity

Situation (情境):

The Pig Pig Chu saw parachutes in the sky. It was amazing (神奇) and he asked his father why the parachute could fall from the sky slowly?

Grade:

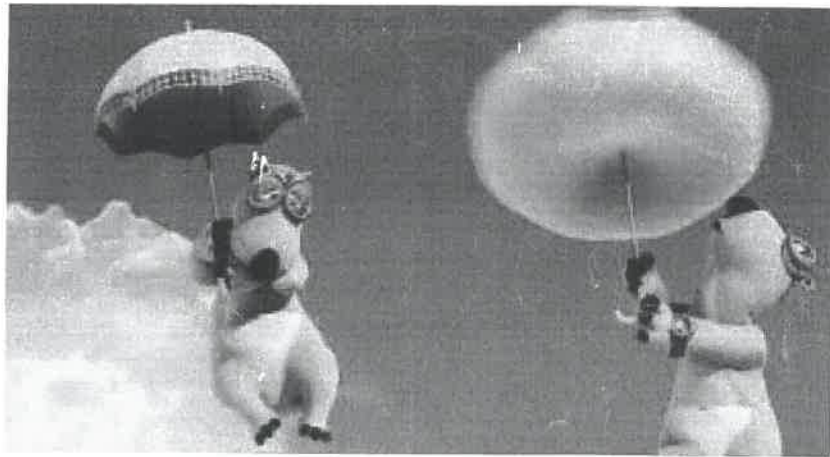
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1. A parachute is an object that uses (air resistance (阻力) / gravity) to reduce (減低) the speed (速度) at which an object falls in the air. (Circle the answer)

2. Watch the flipped classroom video:



Can umbrellas be used as parachutes to allow people to land (降落) safely (安全地) from the sky? (Circle the answer) (Can / Can not). It is because the ribs (傘骨) are destroyed (破壞) by (air resistance / gravity) quickly. The (upwards (向上) / downwards (向下)) air resistance is

(greater (大於) / ~~smaller (小於)~~) than the downwards gravity.  
The object fall to the ground quickly, producing (產生) a huge (巨大) impact force (撞擊力).

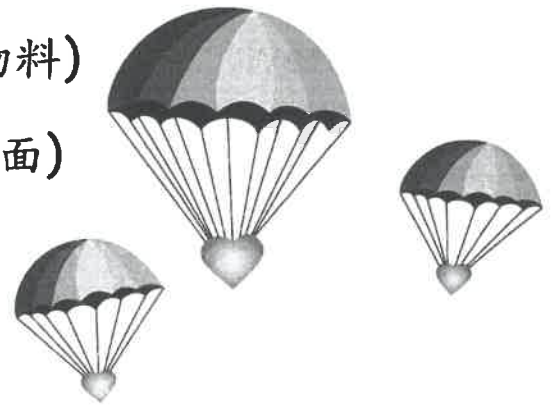
### 3. The Principle (原理) of Parachute

- When an object falls, the air creates (產生) a/an upward force (called air resistance). The larger the area (面積) of the object, the greater the upward resistance of the air. The upward resistance will be (greater / less than / equal to) the downward gravity if the weight (重量) of the object is very light (輕) and the area is large. This make the object fall slowly like a feather (羽毛).
- The parachute is based on the above principle, to increase the surface area (表面面積) of the object, to increase the upward resistance of the air and to resist (抵抗) the gravity, to decrease (減緩) the downward speed (速度).

Which factors (因素) affect (影響) the effectiveness (效能) of a parachute directly (直接) ?

(Put ✓ in the boxes, can be more than one tick)

- The colour of parachute
- The design (設計) of parachute
- The selected (選用) materials (物料)
- The shape (形狀) of umbrella (傘面)
- The size (大小) of umbrella
- The prize (價錢) of materials
- Others : \_\_\_\_\_



## 2. Design and make parachutes

Learning focus :

1. Learn about the structure of a parachute
2. Design and make parachutes

Grade:

A

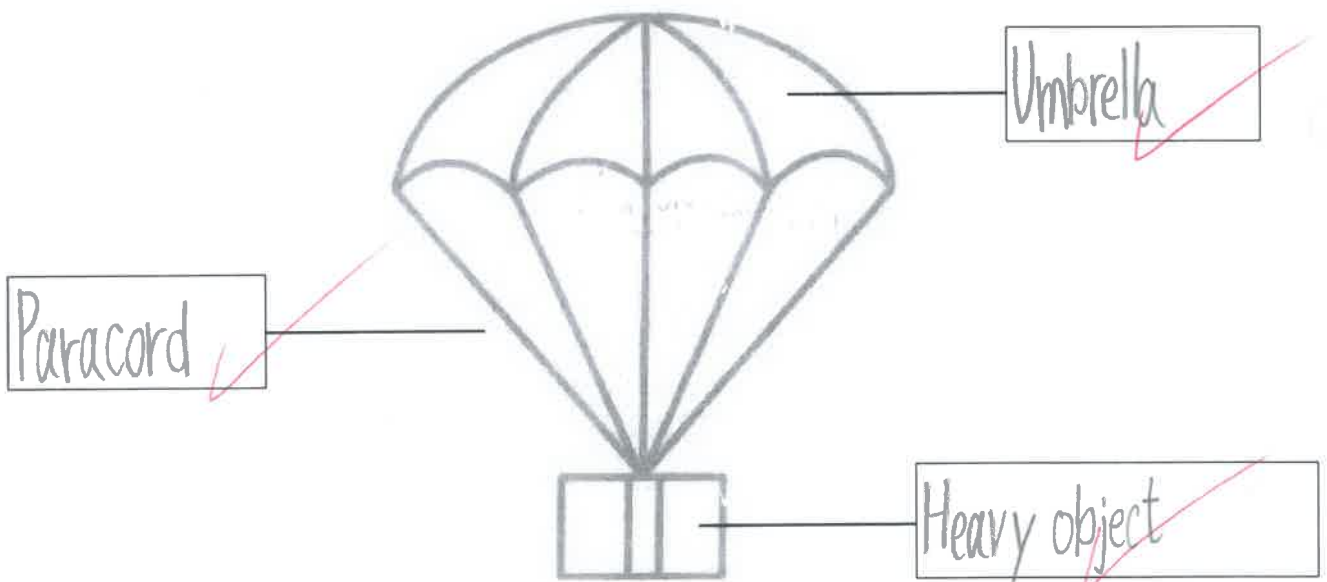
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## 1. The structure of a parachute

Umbrella (傘面)

Heavy object (重物)

Paracord (傘繩)





2. Which scientific knowledge (科學知識) or principle (原理) is related to the parachute ?

(Put ✓ in the boxes, can be more than one tick)

- Gravity ✓
- Elasticity (彈力)
- Electricity (電力)
- Air resistance ✓
- Others : \_\_\_\_\_

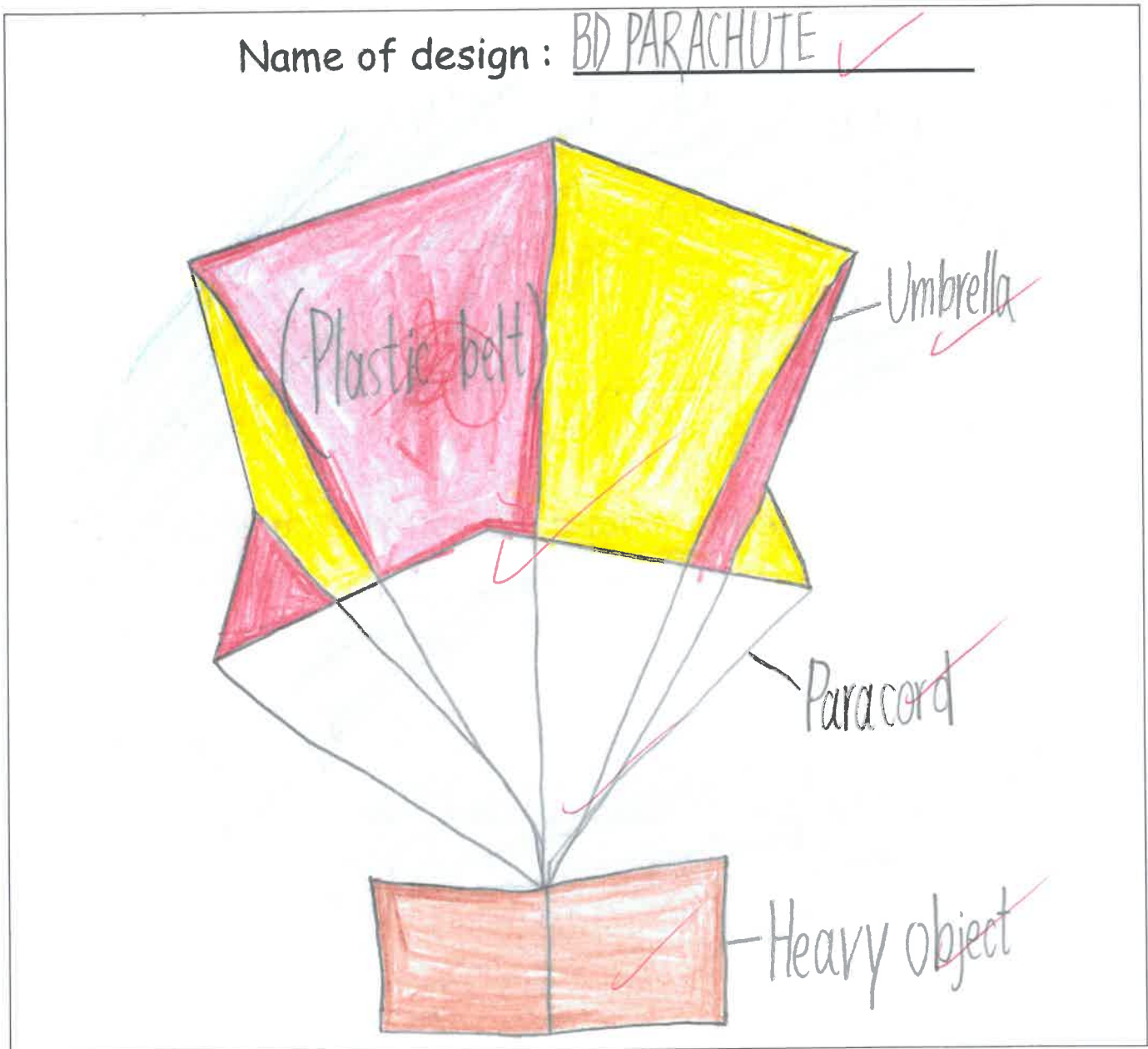
3. Think about the material used for the parachute and the shape of the umbrella. Express (表示) it in a tabular form (表格形式) :

Name of your design	Materials used	The shape of umbrella
BD PARACHUTE ✓	Plastic belt ✓	Octagon ✓

Why you choose this design ? Try to explain (解釋) one of the reasons.

Because the larger the umbrella surface, the more air resistance there will be, and the slower the descent will be. So I will now decide to make an octagon parachute (Just an octagonal parachute here since I don't want to cut too many times).

4. The first design (初步設計) of your parachute (please express in pictures and label each part clearly):



Put 「✓」 if you meet the following requirements (要求)

✓ Name of the product ✓

✓ Complete shape (外形完整)

✓ The label (標示) of materials ✓

✓ Fill in colour (填上顏色) ✓

5. I need the following materials and tools (工具) to make a parachute :

Mateirals:	1 plastic bag (塑膠袋), 4 strings (繩), 4 straws (吸管), 1 paper cup/box and 1 egg
Tools:	Scissors (剪刀), ruler and tape (膠紙)

6. Make a parachute together

Watch the video (影片) to see how to make an egg parachute (雞蛋降落傘).



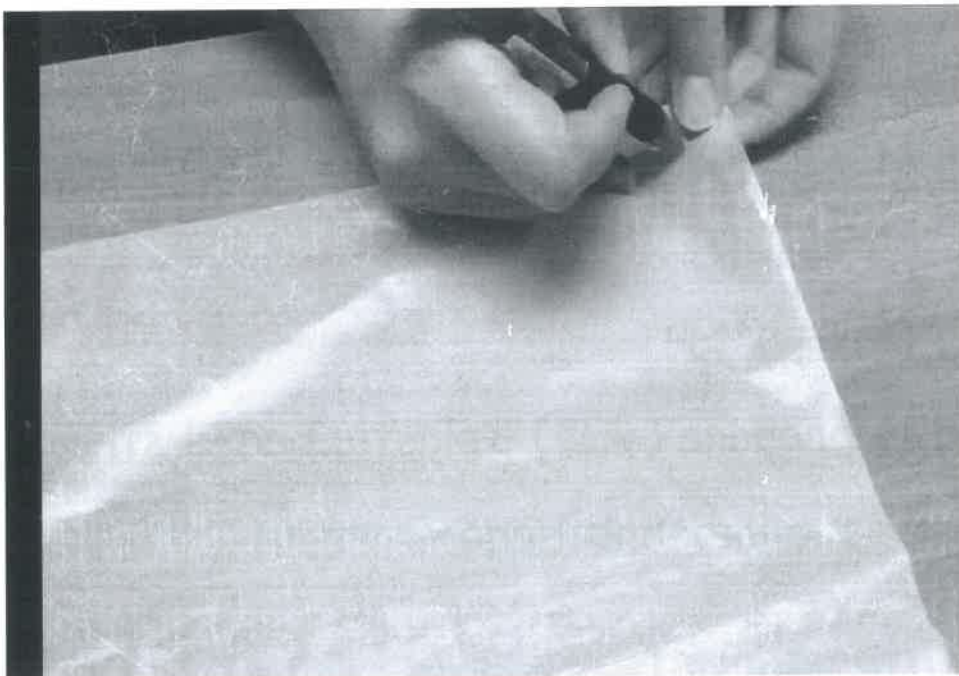
Production steps (製作步驟) :

- Students need to prepare (預備) 1 plastic bag, 4 strings, 4 straws, 1 paper cup/box and 1 egg.

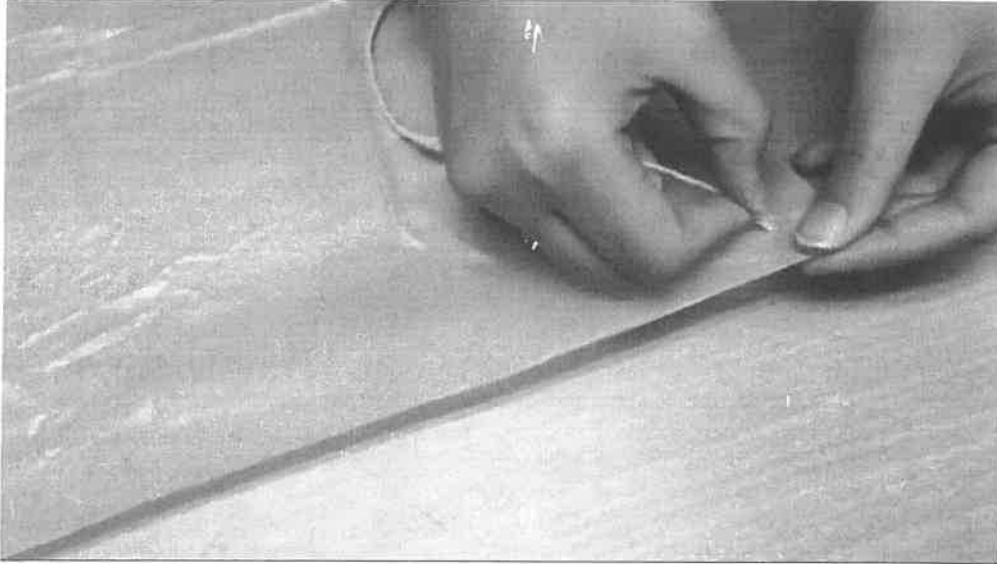
- Then cut the plastic bag into the shape of the umbrella you want, such as: circle (圓形), square (正方形), rectangle (長方形), triangle (三角形), hexagon (六邊形), etc.



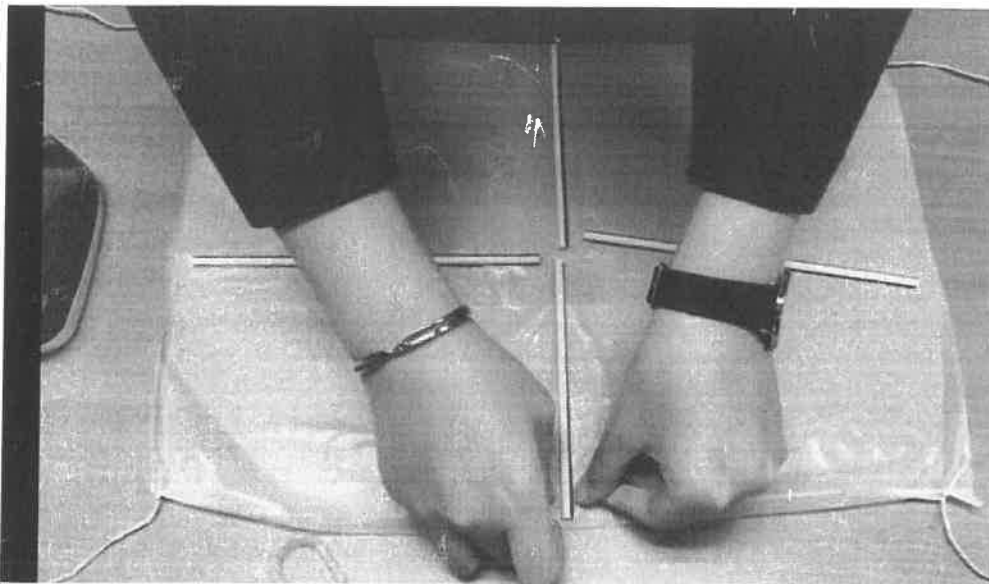
- Use a pen to punch (打上) four holes (孔) in the four corners (角) of the plastic bag.



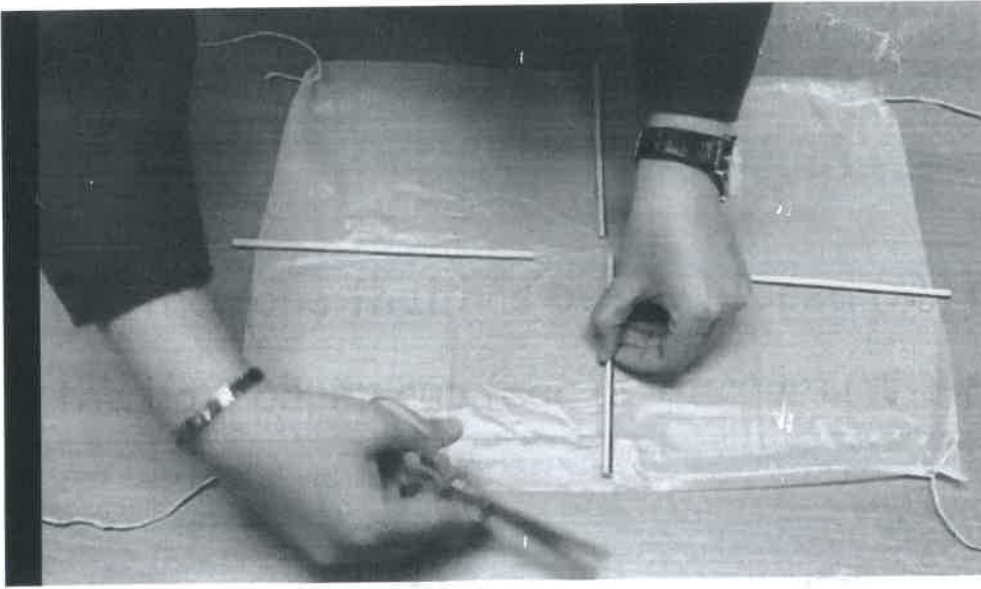
- Pass the four small ropes through the four holes respectively and then tie the knots (打結) which can be fixed with tape (膠紙).



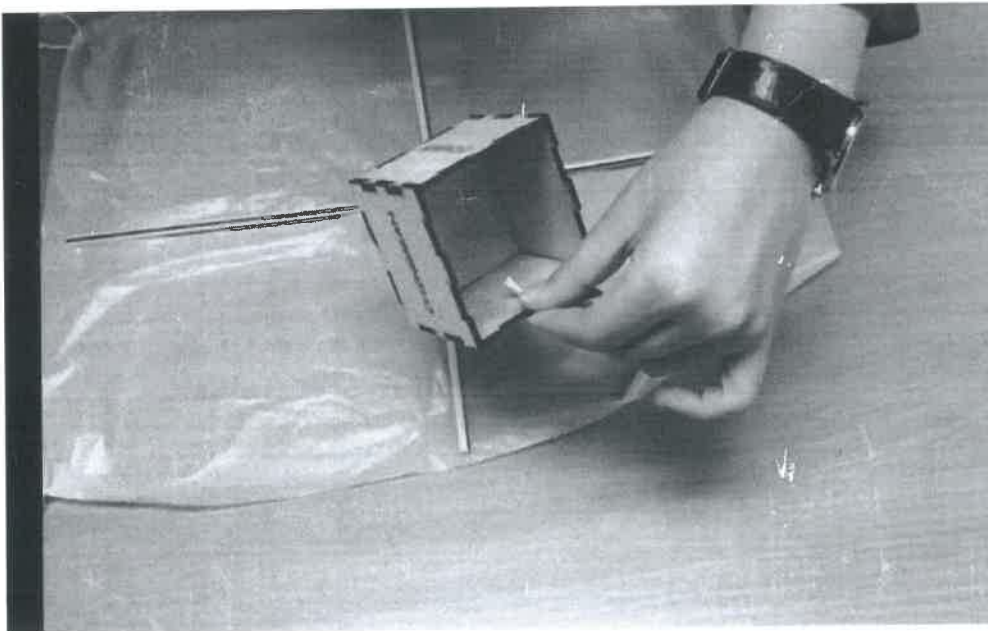
- Arrange (排列) the straws according to your own design and fix them with tape.



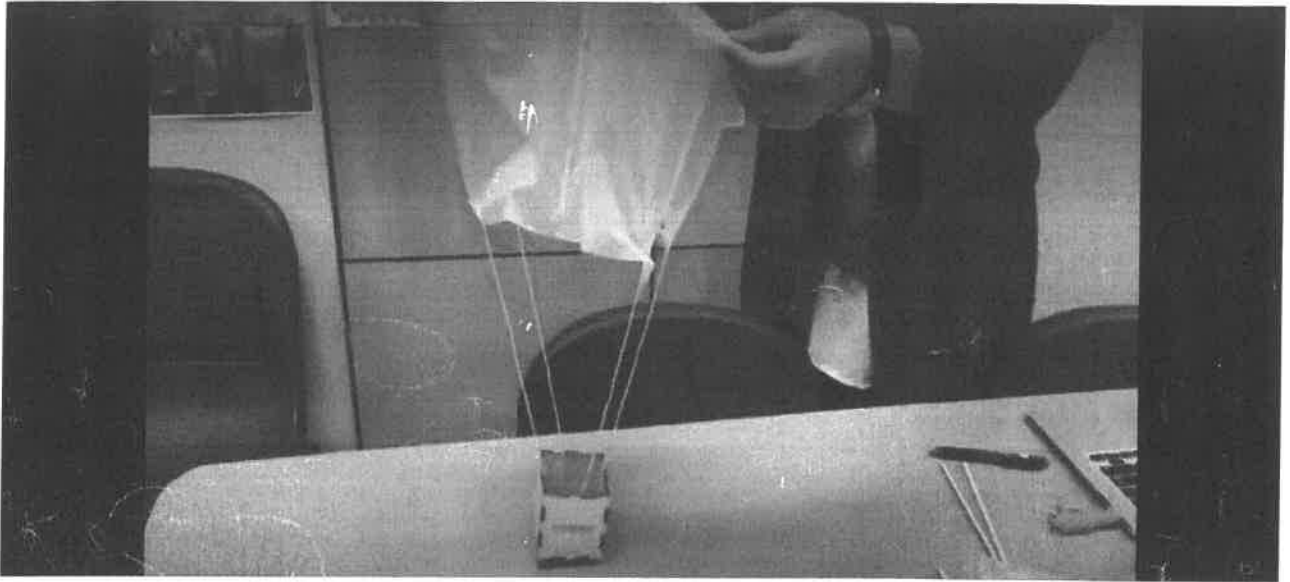
- The excess (多餘) straw part (吸管部分) can be cut off (剪去).



- Fix the rope that has been wrapped (繞) around the hole in the box/paper cup (egg protector) (護蛋器) with tape.



- The egg parachute is done, then put the egg in the egg protector.



### 3. Test parachutes

Learning focus :

#### 1. Test parachutes

Grade:

A

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Prepare the timing tool (計時工具) after completing the first design. Drop (擲下) the parachute from a safe (安全) height with the help of an adult (成年人), test the time it takes to reach the ground and watch the parachute landing off.



Test Record (測試記錄): (Height: 2 m)

Test	landing time (着地時間) (Second)	Egg landing (雞蛋着地的情況) (Add ✓ where appropriate)			Suggested improvement (建議) (改善方法)
		Complete (完整)	slightly cracked (輕微破裂)	Seriously broken (嚴重破爛)	
1	1.71 (s)		✓		Add plastic tape
2	1.91 (s)	✓			Systematically
3	2.56 (s)	✓			larger plastic bag

#### 4. Revise and improve parachutes

Learning focus :

1. Improve parachutes
2. Revise the final work

Grade:

A

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Revision (修訂) and improvement (改良) to make parachutes with the best performance (表現).

1. We observed that the parachute (can / cannot ) let the egg landing completely. (Circle the answer)
2. I decided to (A. not modify (改良) / B. modify) the parachute after completing the test.

A. Choose not to modify the parachute

because \_\_\_\_\_

## B. Choose to modify the parachute

We modify the parachute according to the following conditions (條件): (Put ✓ in the boxes, more than one improvement is allowed)

Increase the size of the umbrella because I want to  
increase the air resistance.

Decrease the size of the umbrella because \_\_\_\_\_  
\_\_\_\_\_

thicker paracord (傘繩) because \_\_\_\_\_  
\_\_\_\_\_

thinner paracord because \_\_\_\_\_  
\_\_\_\_\_

Others: Add more plastic tape because I want to make it  
smooth

3. How to modify the parachute so that the time to stay in the air can be increased?

Increased the size of the umbrella of the parachute.

4. My final work (post photos or drawings) :

