Confucian Tai Shing Primary School

2021-2022   Second term

P2 STEM

School-based curriculum

Homemade parachute (自製降落傘)

exploring activity

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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?

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
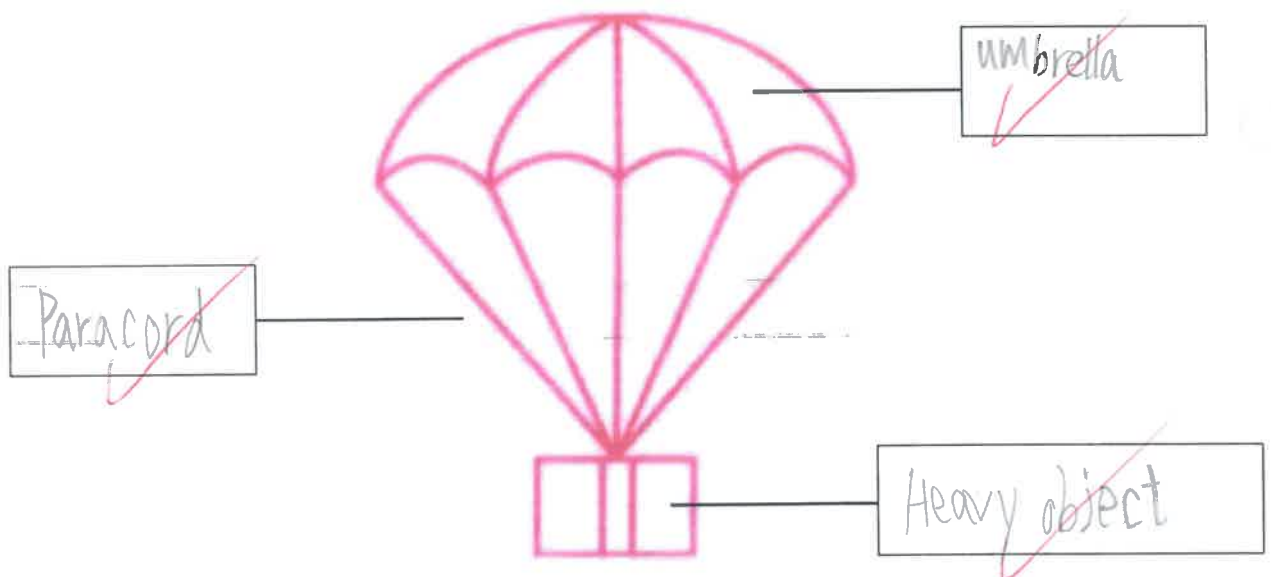
   of a parachute

2. Design and make parachutes

21.8

1. The structure of a parachute

Umbrella (傘面)	Heavy object (重物)
Paracord(傘繩)	

umbrella

Paracord

Heavy object

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)

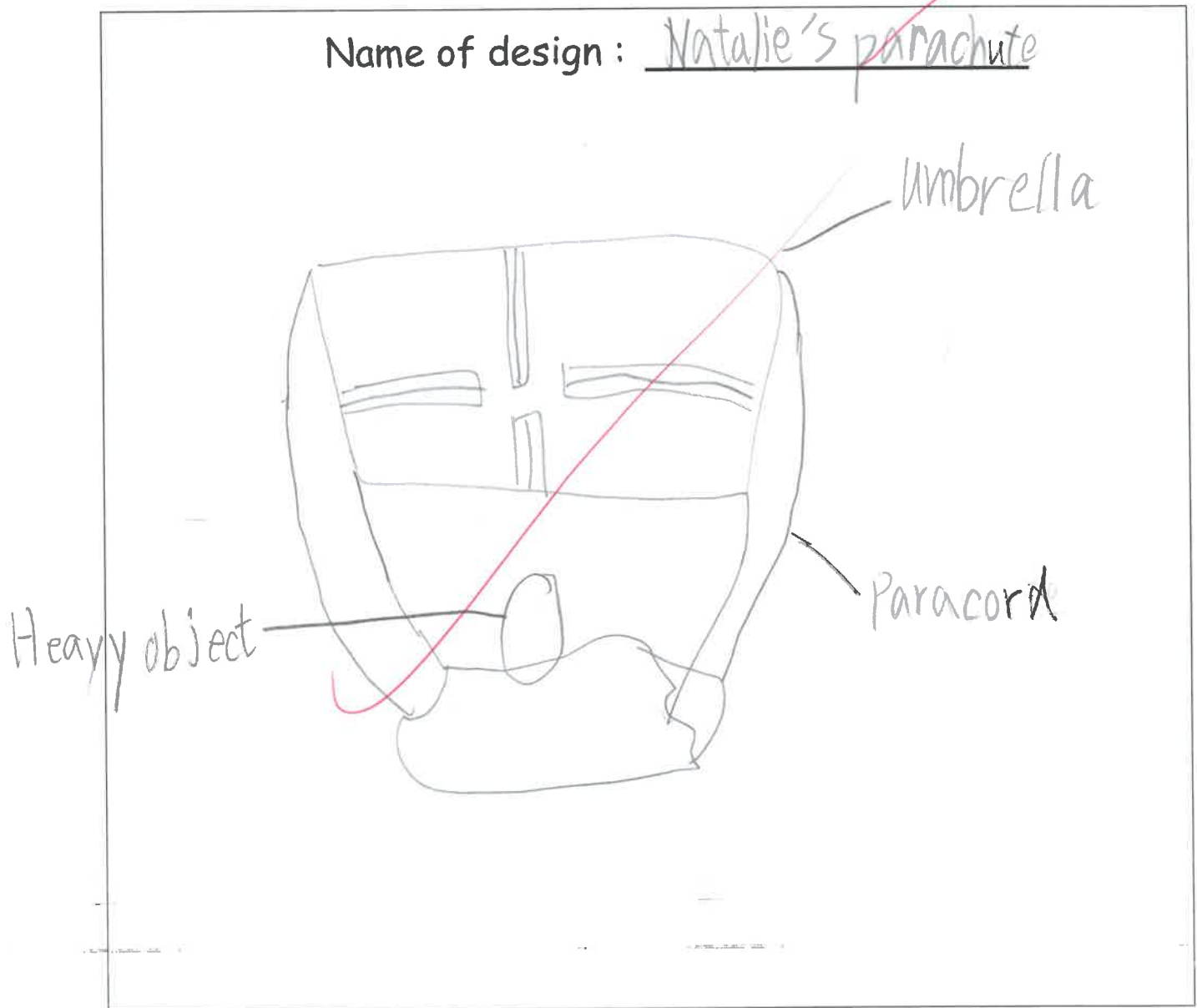   ☑ Air resistance

   ☐ 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
Natalie's parachute	Plastic	Triangle

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

Because the design is unique. The triangle parachute is very special and cool.

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

Name of design : _Natalie's parachute_

Umbrella

Paracord

Heayy object

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.

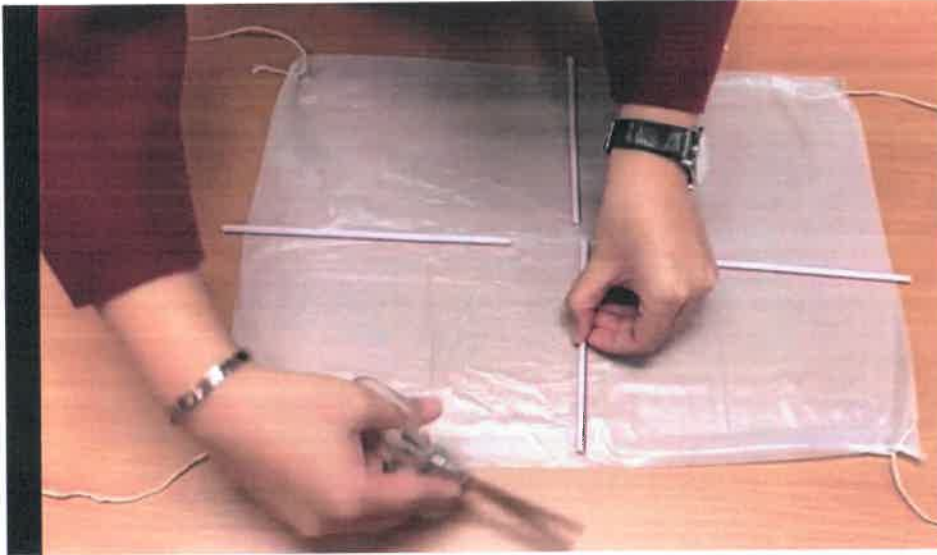- Use a pen to punch (打上) four holes (孔) in the four corners (角) of the plastic bag.

● 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).
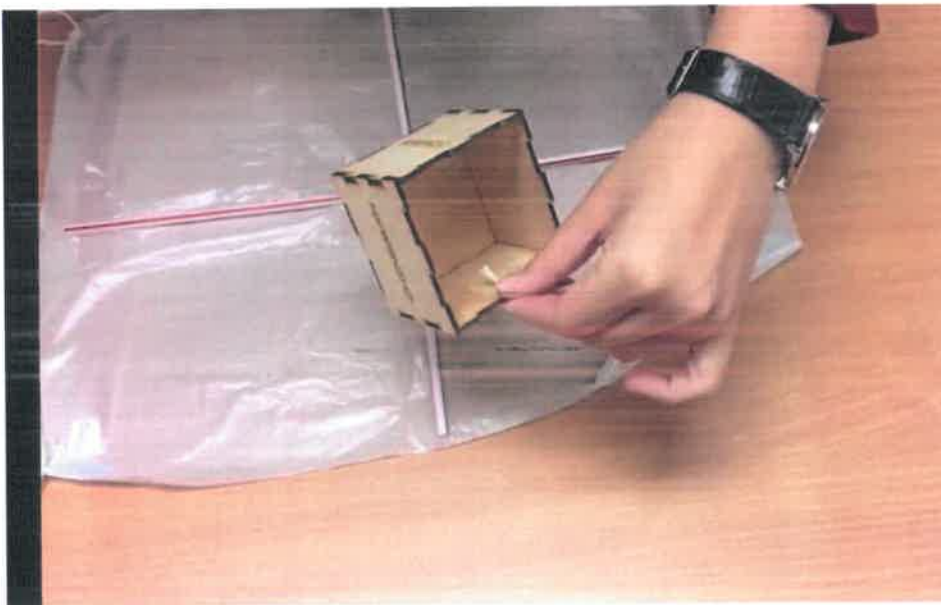

● Arrange (排列) the straws according to your own design and fix them with tape.

- 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

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)：

Test	landing time (着地時間) (Second)	Egg landing (雞蛋着地的情況) (Add ✓ where appropriate)			Suggested (建議) improvement (改善方法)
		Complete (完整)	slightly cracked (輕微破裂)	Seriously broken (嚴重破爛)	
1	1.44	✓	⁄		
2	0.44	✓			
3	1.22	✓			

4. Revise and improve parachutes

Learning focus :

1. Improve parachutes

2. Revise the final work

Grade:

B+

26.5

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 ___the parachute is complete and perfect.___

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 _____

_____

☐ Decrease the size of the umbrella because _____

_____

☐ thicker paracord (傘繩) because _____

_____

☐ thinner paracord because _____

_____

☐ Others : _____

_____

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

change the size of umbrala is bigger.

(Increase the surface area of umbrella.

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