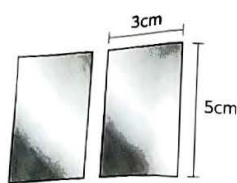
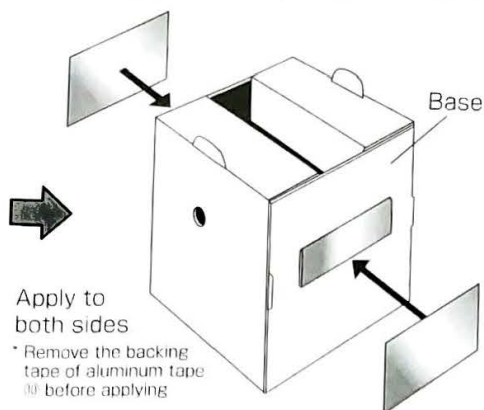


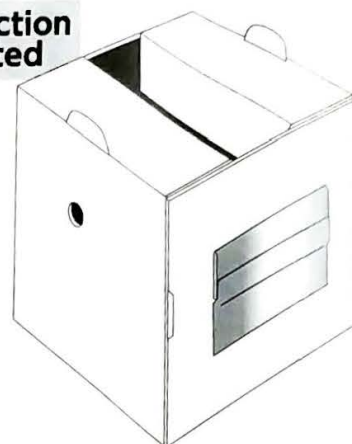
- 7** Cut two pieces of aluminum tape ⑩ 5 cm wide and 3 cm long. Apply them to the ends of part ③ (inserted in step 6) to secure it.



Cut aluminum tape ⑩ as shown above.

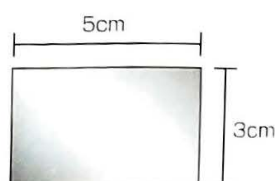


Base section completed

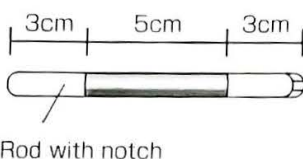


2 Attachment of lower roller [Prepare ④⑥⑦⑧⑩]

- 1** Cut aluminum tape ⑩ in the length shown below.



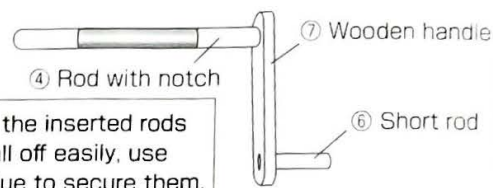
- 2** Wrap the center part of rod with notch ④ with aluminum tape from step 1.



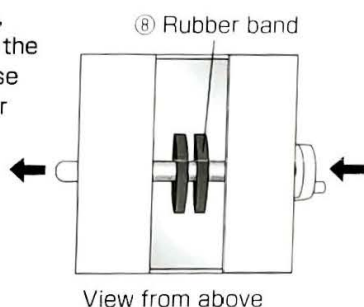
④ Rod with notch

* Aluminum tape should be applied wrinkle-free

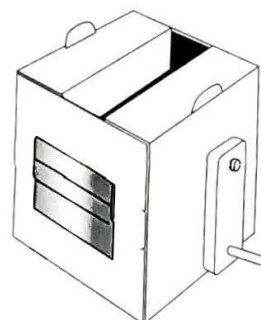
- 3** Insert rod with notch ④ and short rod ⑥ into wooden handle ⑦.



- 4** As shown on the right, insert the rod through the hole on the side of base ① and hang two rubber bands ⑧ on the rod.

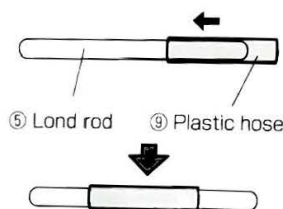


Attachment of lower roller completed!

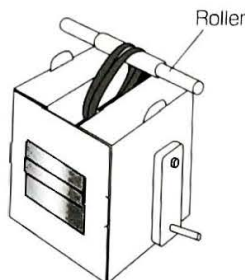


3 Attachment of upper roller [Prepare ⑤⑨⑬]

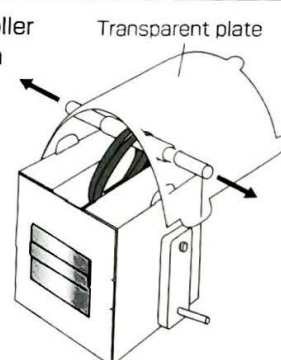
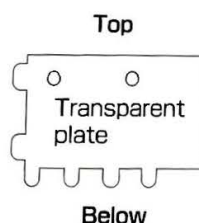
- 1** Insert long rod ⑤ into plastic tube ⑨. Place plastic tube in the center.



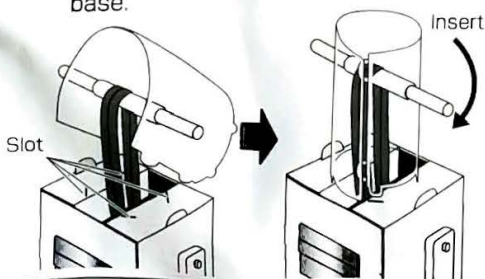
- 2** Pass roller created in step 1 through the rubber bands.



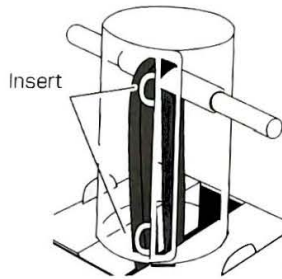
- 3** Pass both ends of roller through two holes on transparent plate ⑬.



- 4** While stretching the rubber bands, raise transparent plate ⑬ so that its four tabs are facing down. Roll it up into a tube and insert the tabs into the slots of base.

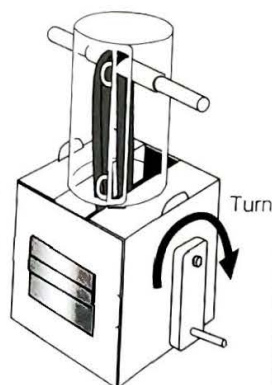


- 5** Insert two tabs of transparent plate ⑬ into the slots on the other side of the plate.



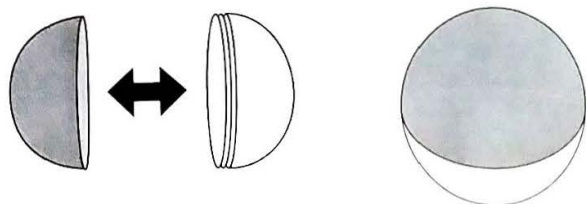
Attachment of upper roller completed!

* Turn the handle to see if upper roller turns smoothly.
* If the end of plastic tube contacts transparent plate and interferes the turning, cut the tube to make it a little bit shorter.

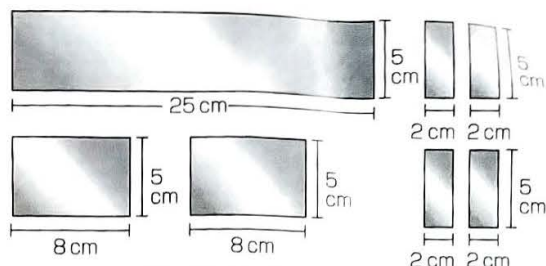


4 Attachment of collecting sphere [Prepare ⑩⑪⑫⑬]

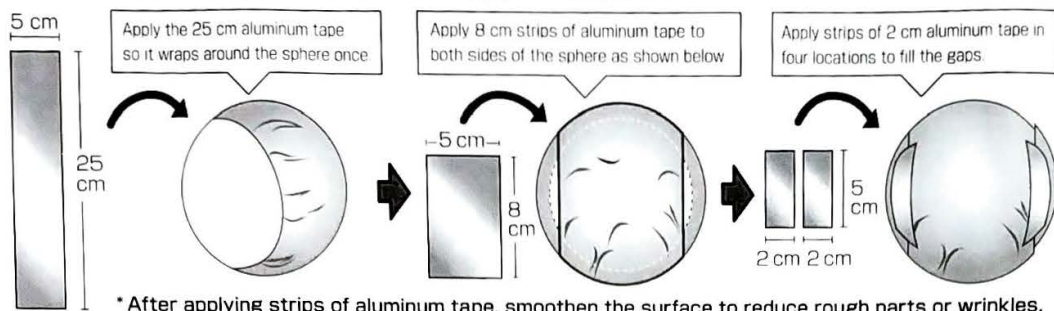
- 1** Assemble transparent hemisphere ⑪ and transparent shield ⑫ to make a sphere.



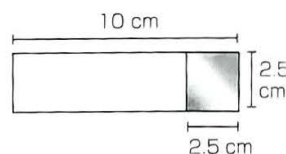
- 2** Cut seven strips of aluminum tape ⑩ in the dimensions shown below.



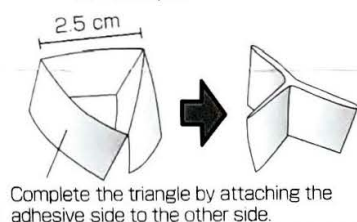
- 3** Apply the aluminum tape (from step 2) to the sphere. Make sure you cover the entire surface of the sphere. Do not leave any plastic exposed.



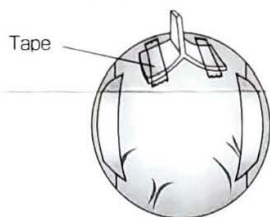
- 4** Cut a 10cm long piece of aluminum tape ⑩. Next, cut in half lengthwise and peel off 2 cm of the backing paper from one edge.



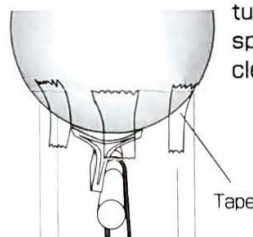
- 5** As shown below, make an equilateral triangle using the strips of aluminum tape you prepared in step 4. Bend two sides to make a T-shape.



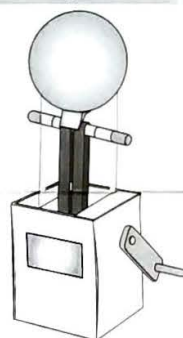
- 6** As shown below, Use clear tape to attach the aluminum tape prepared in step 5 to the sphere prepared in step 3.



- 7** Place the sphere on top of the cylindrical polypropylene sheet. Aluminum tape attached in step 6 should be lightly touching the rubber bands on the plastic tube. Secure the sphere with clear tape.



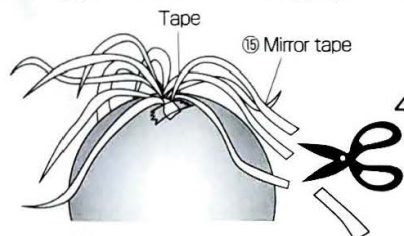
Completed



How to experiment 1

Experiment using electrostatic pompon

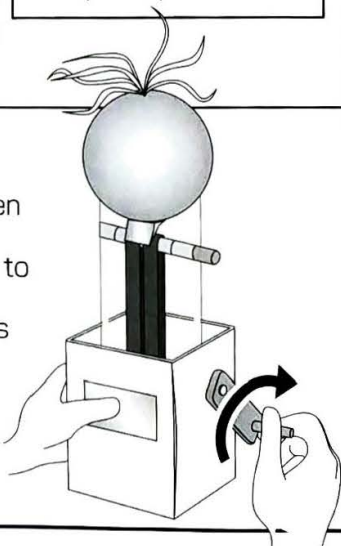
- 1** Using clear tape, attach mirror tapes ⑮ to the top of the collecting sphere.



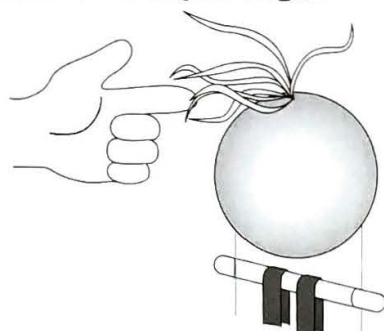
Using scissors, adjust the length of mirror tapes so that they do not touch the transparent plate.

- 2** Grip the base where the aluminum tape covers the surface and turn the wooden handle. The strands of the pompon will gradually start to stand on end and you can see that static electricity is being generated.

* At this time, confirm that the aluminum tape is touching the rubber bands at the position of the lower roller.



- 3** **1** Slowly move your finger toward the sphere. The strands of the pompon will be attracted to your finger.



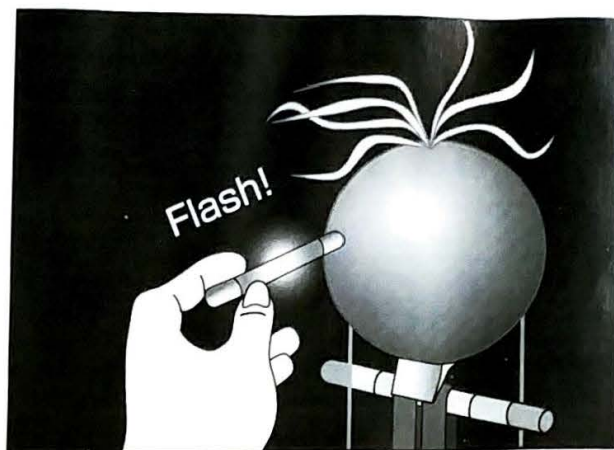
- 2** When you touch the mirror tapes and collecting sphere, the static electricity accumulated on the sphere will be discharged and the mirror tapes will fall down.



How to experiment 2

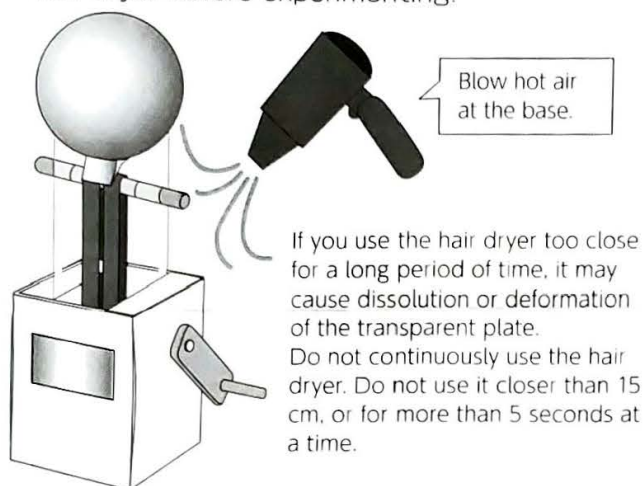
Light a neon bulb!

Make the room completely dark. As you move the neon bulb ⑭ toward the collecting sphere (where static electricity had accumulated) the neon bulb will flash orange for a moment.



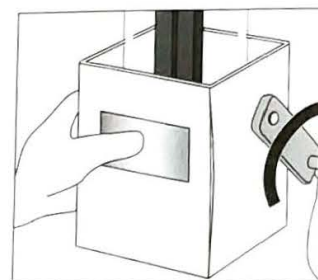
When you have problems during the experiment...

- Static electricity hardly occurs when humidity level is high. Dry the inside of the tube with a hair dryer before experimenting.



- Static electricity has trouble accumulating when the rubber bands are dirty or dusty. Remove as much dirt and dust as possible.

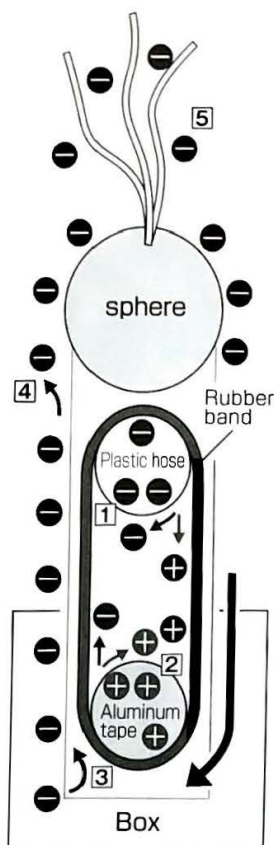
- When turning the handle, please make sure your other hand is touching the lower aluminum tape on the outside surface of the base.



- Confirm that the upper and lower aluminum tapes are touching the rubber bands.
- Confirm that the upper roller is turning smoothly.

Principles

Sometimes when the room air is dry, your sweater crackles. This is static electricity. Static electricity is generated when different materials are rubbed against each other, one having negative electricity, and the other having positive electricity. Like charges repel each other while opposite charges attract.



- 1 In the upper roller where the rubber bands rub against the plastic tube, the inside of the rubber bands will accumulate positive electricity and the plastic tube accumulates negative electricity.
- 2 In the lower roller, when the rubber bands rub against the aluminum tape, the inside of the rubber bands will accumulate negative electricity and the aluminum tape will accumulate positive electricity.
- 3 Attracted by the positive electricity of the aluminum tape, negative electricity will accumulate on the outside of the rubber bands through the human body.
- 4 Negative electricity accumulated on the rubber bands in the previous step will be carried upward. When it comes to the plastic tube, it will be repelled by the negative electricity of the plastic tube, and accumulate on the sphere instead.
- 5 Because the pompon is negatively charged, like the collecting sphere, they will repel and cause the pompon strands to stand on end.

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K0812 065686

SC Van de Graaff Generator

Instructions

⚠ Caution Make sure to read this carefully before use. (Parents/educators, make sure to read these instructions carefully.)

Be sure to read these instructions carefully and observe all warnings and directions.

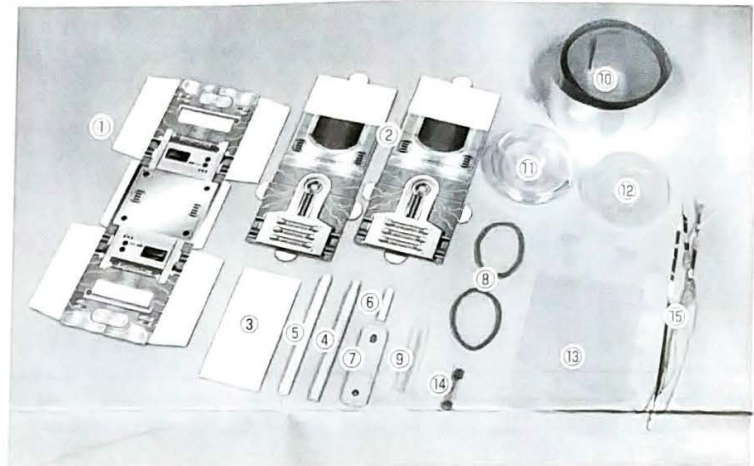
- Keep this product away from small children, high temperatures or humidity, and direct sunlight.
- Contains sharp edges/points. Handle with care to prevent injury.
- Flammable. Do not store or use this product near open flame or heat sources.
- CHOKING HAZARD-Small parts. Not for children under 3 yrs. Keep children from accidentally swallowing small parts.

Preparation prior to assembly

- Take a close look at the list of contents and make sure you have all the parts.
- Read the instructions in their entirety before beginning assembly.

Contents

- | | |
|------------------------|------------------------------|
| ① Base part x 1 | ⑨ Plastic tube x 1 |
| ② Side part x 2 | ⑩ Aluminum tape x 1 |
| ③ Rectangular part x 1 | ⑪ Transparent hemisphere x 1 |
| ④ Rod with notch x 1 | ⑫ Transparent shield x 1 |
| ⑤ Long rod x 1 | ⑬ Transparent plate x 1 |
| ⑥ Short rod x 1 | ⑭ Neon light x 1 |
| ⑦ Wooden handle x 1 | ⑮ Mirror tape x 5 |
| ⑧ Rubber band x 2 | |

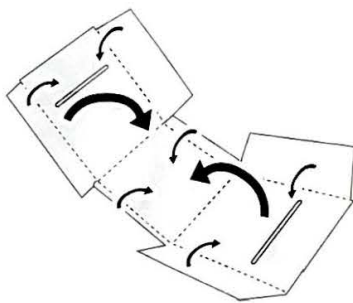


You will need

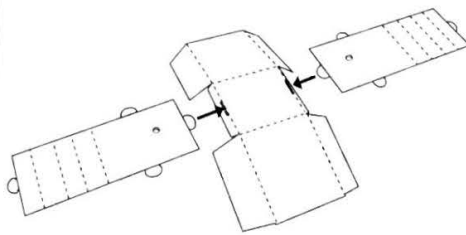
- Scissors
- Tape

1 Assembly of base [Prepare ①②③⑩]

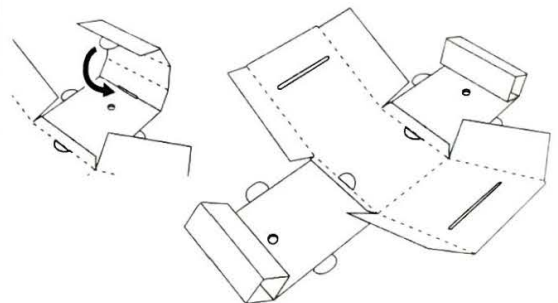
- 1** Mountain fold all the folding lines of base part ①.



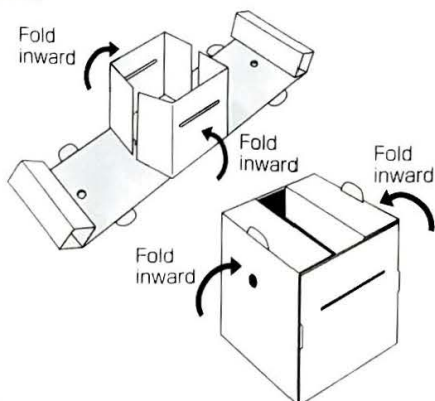
- 2** Insert side parts ② into base part ① as shown below.



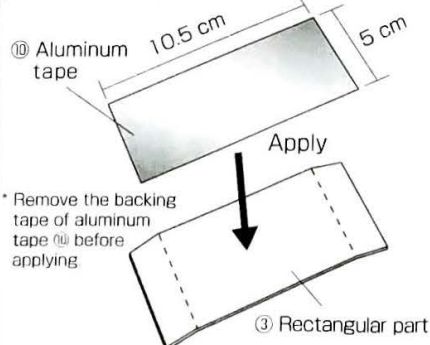
- 3** Fold side parts ② as shown below and insert the tabs into the slots. (both sides)



- 4** Assemble the parts to make a box.



- 5** Cut a piece of aluminum tape ⑩ 5 cm wide and 10.5 cm long. Apply it to the surface of rectangular part ③.



- 6** Insert the plate created in step 5 into the slots on the sides of base so that the surface of aluminum tape is facing up.

