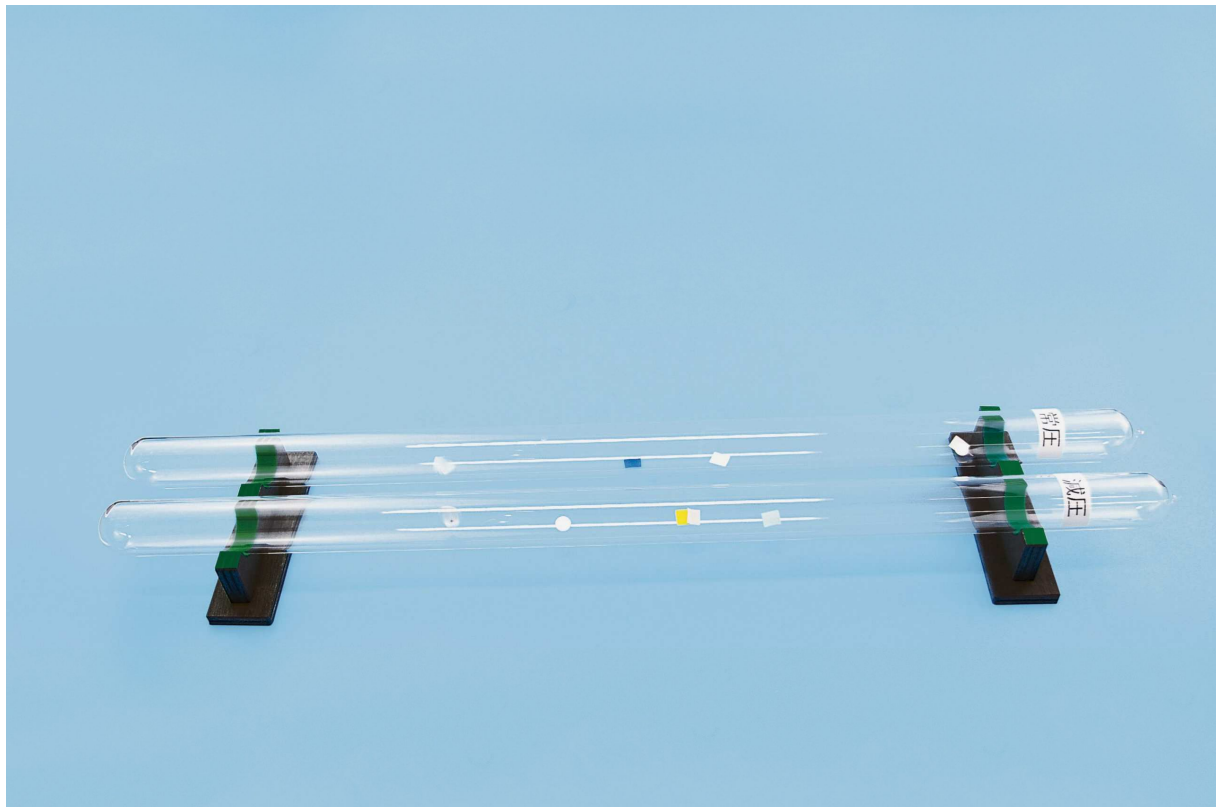


# Instruction manual

Cat. No. C15-2101-W0

## Comparative Free Fall Tubes



July 2022

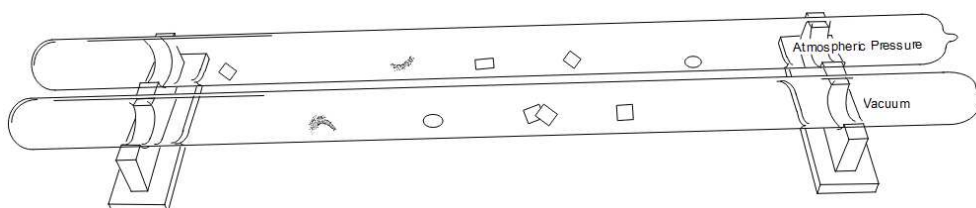
## ! Safety Precautions

- ⊘ This product is made of glass, it is easy to break, be careful when handling.
- ⊘ Check the condition of the glass tube surface every time carrying out an experiment. Should you find crack in the glass tube surface, do not use it. The tube might break during the experiment because of the cracks and result in injury.
- ⊘ This product is for a teacher's demonstration only. It is not intended for students' experiments.
- ⊘ Use the dedicated wooden base that comes with the product in order to prevent the glass tube(s) from falling from the lab bench when in use or for storage.

## Product's Feature

Pair of glass tubes with different air pressure conditions this should be different word. Objects encapsulated in each tube are the same both in types and quantities. Those are feathers, pieces of metal, and pieces of paper. Easy to demonstrate and compare how those objects fall, respectively, in a tube of which inner condition is decompression state and in the other tube of which inner condition is at a normal atmospheric pressure.

## Specification



- Atmospheric Air Pressure Tube: 1 pc
- Decompressed Tube: 1 pc
- Material: Glass
- Encapsulated objects: 3 types (feather, paper, metal)
- Size of the tubes:  $\varnothing 40 \times 750\text{mm}$  (each)
- Wooden base: One pair

## Instruction Guide

1. Hold the atmospheric air pressure tube vertically and show it to students.
2. Make sure no obstacle is within 1 m of the tube when carrying demonstration to prevent it from being damaged.
3. Try to draw students' attention to the objects (feathers, pieces of paper and metal) at the bottom of the tube.
4. Call your students' attention to free-fall motion of those objects falling inside the tube.
5. Quickly and carefully invert the tube.

Students will notice that each object fall at different speed. Metallic pieces fall at the fastest speed and feathers fall at the lowest speed. Repeat the demonstration several times because the free-fall drop of the objects may be too fast for some students.

6. After the demonstration of above 1. through 4., hold the decompressed tube vertically and show it to students.
7. Call your students' attention to the objects (feathers, pieces of paper, and metallic pieces) at the bottom of the tube.
8. Call their attention again to the way those objects fall inside the tube.
9. Quickly and carefully invert the tube to repeat above 6. Through 7.

Students will notice that all types of the objects fall at the same speed regardless of the weights in a near vacuum condition. Repeat the demonstration several times because the free-fall of the objects, especially under the near vacuum condition, may be too fast for some students.

## Storage Method

1. Wipe the tubes with a soft cloth to check if there is any crack.
2. Wrap the tubes with cushions and pack them into the box.
3. Do not place anything on the box during storage.