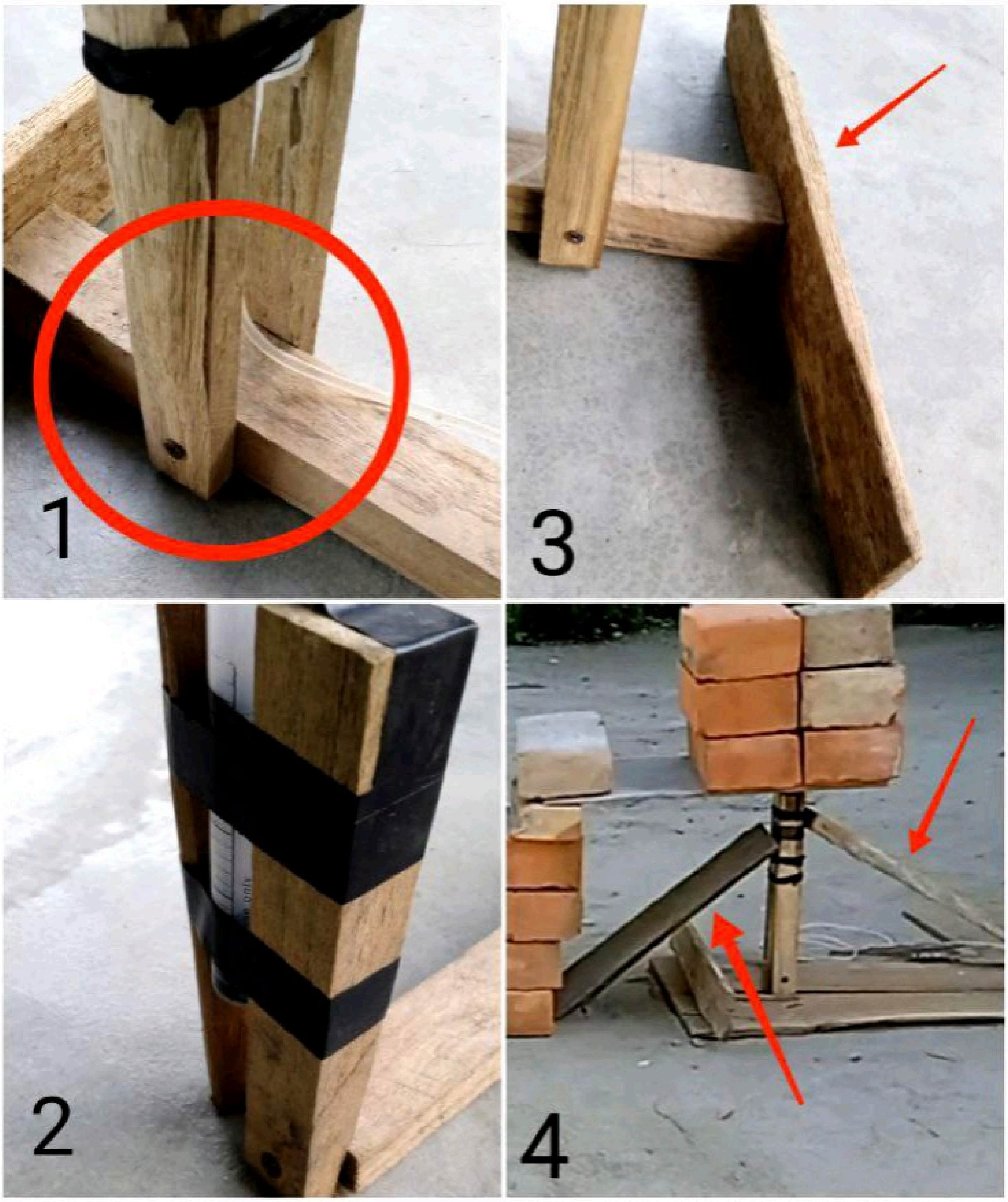
* Requirements

1. Two different sized syringes (60ml & 25ml)
2. Four wooden sticks for stands /
   A Big wooden stick for foundation
3. Tape / Some screws / Inner tube of a ~~tire~~ tyre
   (To tie the syringes)
4. A medical tube

* How to build a Hydraulic Lift

1. First, fix the two wooden sticks each side of the foundation wooden stick (use screws.
   (Figure :1)
2. At the opposite of that stand, fix another a small stand again (Figure:2)
3. Use a wooden stick to hold a balance
   (Figure :3)
4. Then place the syringes on the stands respectively, and join the two syringes with a medical tube.
   (You can use tape / strings that are cut from the inner tube of a tyre)
5. If your loaded weight is large,
   I recommend for making some prop
   (Figure :4)


1
3
2
4

* Experimental Data

- Height of small syringe = 10.4cm (Syringe 1)
- Height of big syringe = 11.5 cm (Syringe 2)
- Friction = 1kg (1 liter of pure water)
- Loaded weight for Syringe 1 = Total - Friction
  = 6 kg - 1kg
  = 5 kg
- Loaded weight for Syringe 2 = 18 kg (6 bricks
  (1 brick = 3kg)

* Calculation

* $F = mg$

$$\frac{F_2}{F_1} = \frac{18\,kg \times 9.8}{5kg \times 9.8}$$

$$= \frac{176.4N}{49N} = \frac{3.6N}{1N}$$

$F_1 = 1N$ / $F_2 = 3.6N$

* $V_1 = L \times W \times H$

$25cm^3 = A \times 10.4cm$

$$A = \frac{25cm^3}{10.4cm}$$

$A_1 = 2.4cm^2$ (rounded)

* $V_2 = L \times W \times H$

$60cm^3 = A \times 11.5cm$

$$A = \frac{60\,cm^3}{11.5cm}$$

$A_2 = 5.2\,cm^2$ (rounded)

- Volume of S_1 = 25 ml
  = $25cm^3$
- Volume of S_2 = 60ml
  = $60cm^3$

* $1ml = 1cm^3$

$P_1 = P_2$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$\frac{1N}{2.4cm^2} = \frac{3.6N}{5.2cm^2}$$

$0.4 \, N/cm^2 = 0.7 \, N/cm^2$ (0.3 error)

* distance before small syringe is pressed = 9.6cm (h_1)
* rising distance ~~dit~~ of big syringe after small syringe is pressed = 4.4cm (h_2)

$$\frac{h_2}{h_1} = \frac{4.4cm}{9.6cm}$$

$= 0.5cm$

* $\frac{h_2}{h_1} < 1$

Before the small syringe was pressed, it's distance is 9.6cm. When it's pressed, the big syringe went up 4.4cm.
The proportion of those ($\frac{h_2}{h_1}$) is 0.5, half of one.
I think it's reasonable.
The two syringes have different areas
Area is directly proportional to Force.
According to work-energy theorem,

$$\text{Input Work} = \text{Output Work}$$
$$F_1 d_1 = F_2 d_2$$

F_1 is smaller than F_2. So d_1 must be larger than d_2 due to be constant.
So, if the Force is smaller, the distance is larger and if the force is larger, the distance is smaller.

* Since the two distances aren't the same, $\frac{h_2}{h_1}$ won't be exactly 1.

* If F_2 is three times larger than F_1, d_2 must be three times smaller than d_1.
So their values aren't very close.
That's why it can't be grater than 1.

* So, I think ($\frac{h_2}{h_1}$) is smaller than 1.