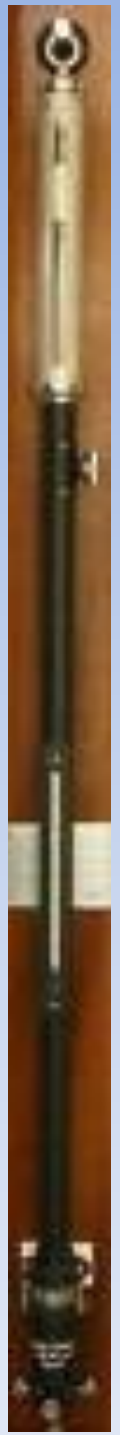
Wx Proj:
Reading our Fortin (mercury) Barometer



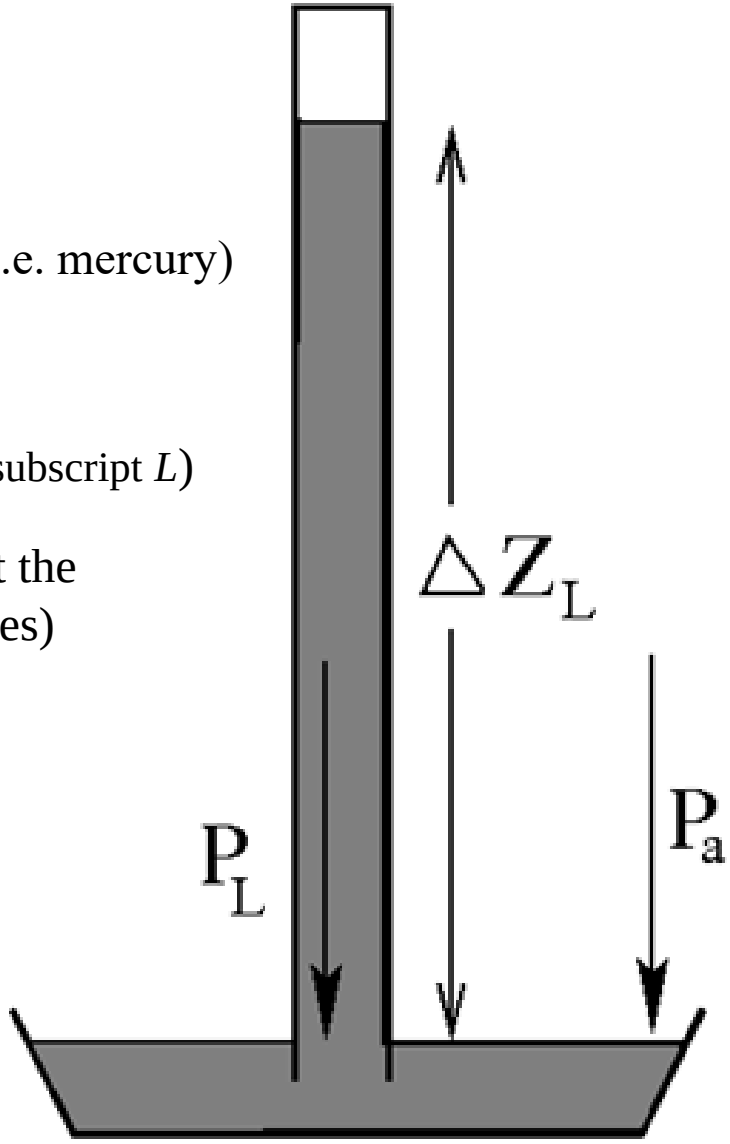
See Wx Proj Barometer Handout

Wx Proj:
Reading our Fortin (mercury) Barometer

From this week's Wx Proj Barometer Handout

$P_L = \rho_L g \Delta Z_L$ → subscript "*L*" denotes "*liquid* " (i.e. mercury)

- P_L = **pressure** due to the mercury column
- ρ_L = mercury's **density** (note: ρ is the Greek letter rho, subscript *L*)
- g = acceleration of **gravity** (use 9.80665 m s^{-2} to get the appropriate precision for the needed significant figures)
- ΔZ_L = **height** of the mercury column



Reading a Mercury Barometer

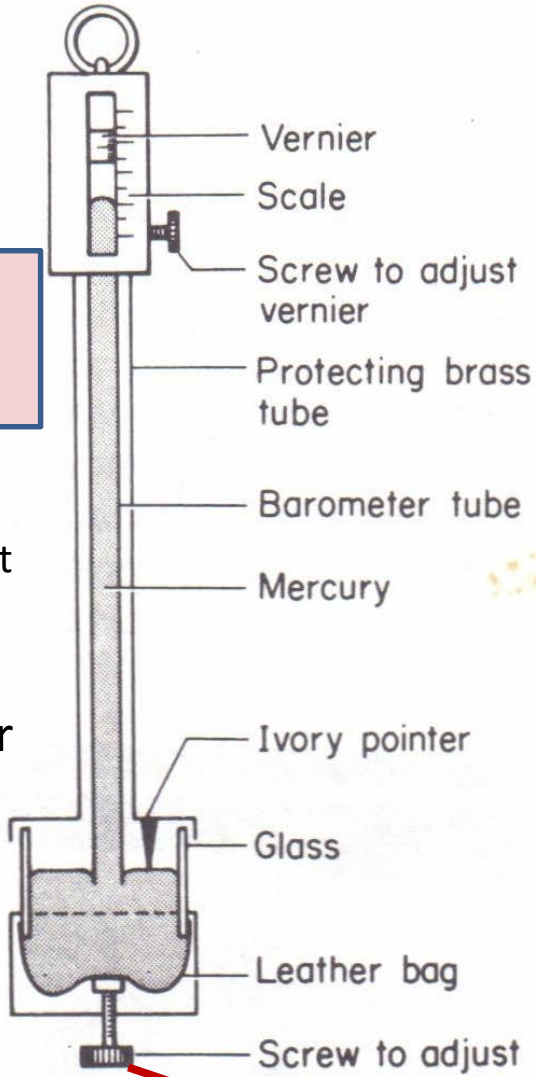
The process:

1) Adjust the bottom mercury reservoir

2) Adjust the vernier scale slider (located at the top)

3) Read the barometer height in millimeters of mercury

4) Record the temperature of the mercury in order to apply corrections



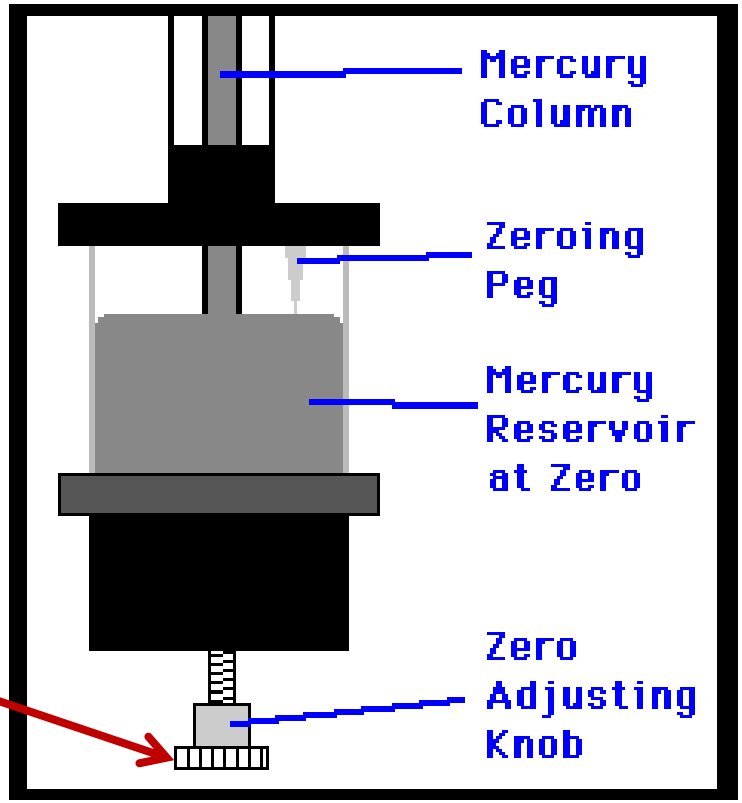


Image from: http://www.instruction.greenriver.edu/kmarr/Chem%20161/Instrument-%20Glassware%20Videos/How%20to%20Zero%20and%20Read%20a%20Barometer/How%20to%20zero%20and%20read%20a%20barometer.htm

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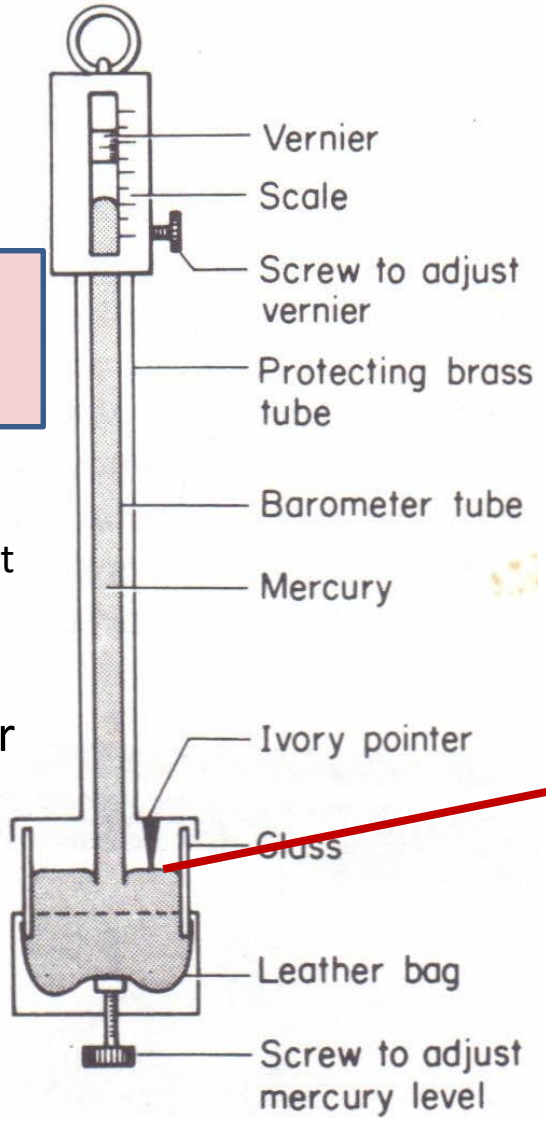

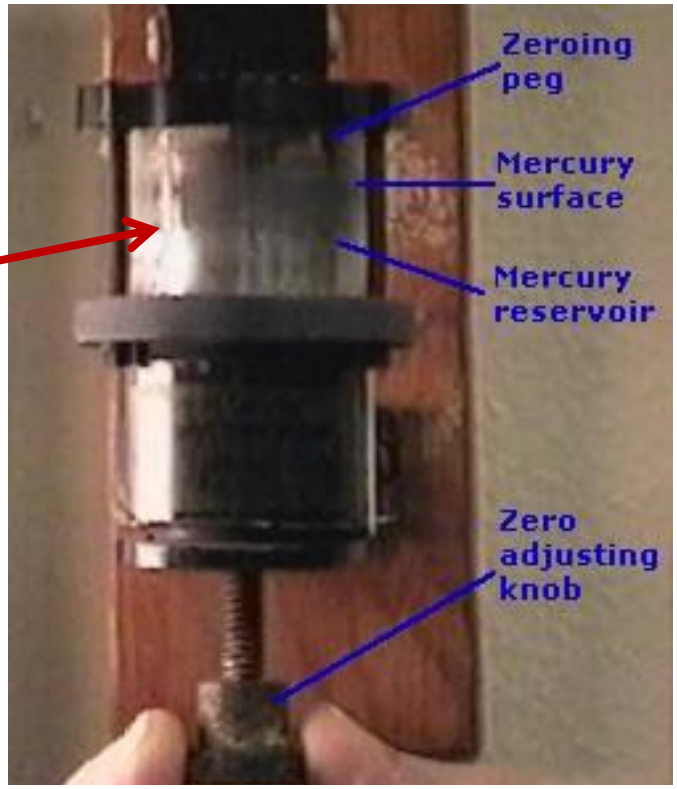

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Reading a Mercury Barometer

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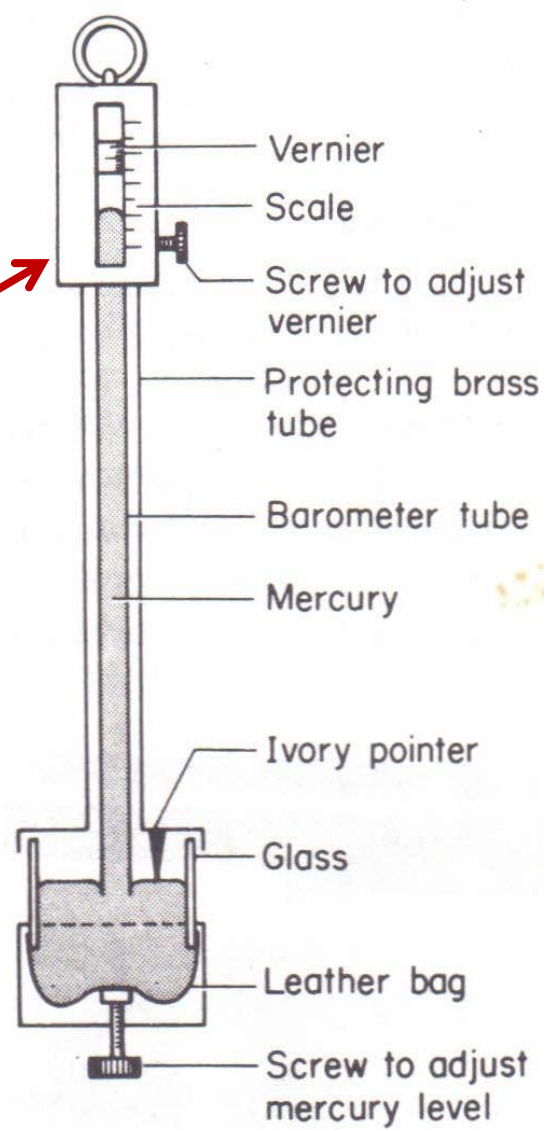

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Reading a Mercury Barometer

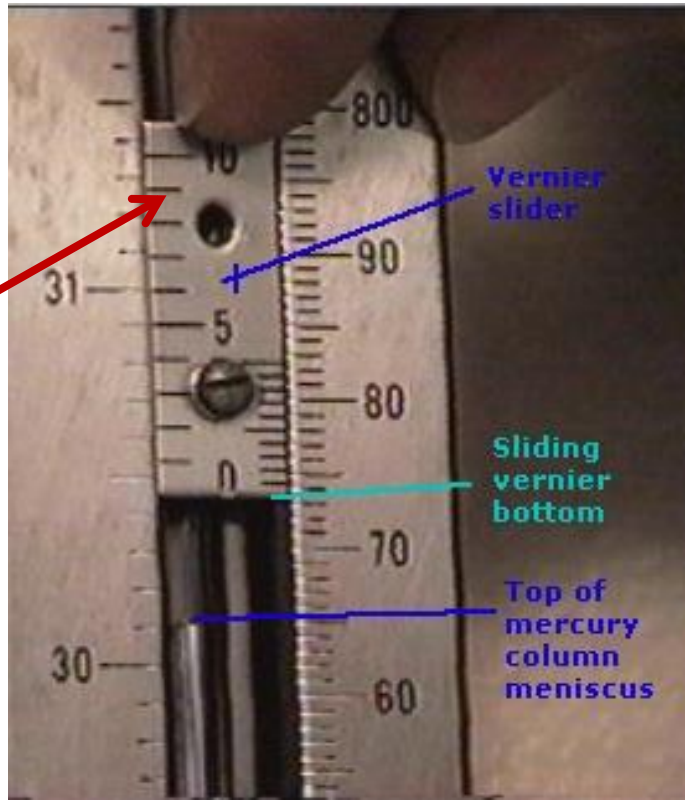
The process:

1) Adjust the bottom mercury reservoir

2) Adjust the vernier scale slider, so that it is just touching the top of the mercury meniscus

3) Read the barometer height in millimeters of mercury

4) Record the temperature of the mercury in order to apply corrections



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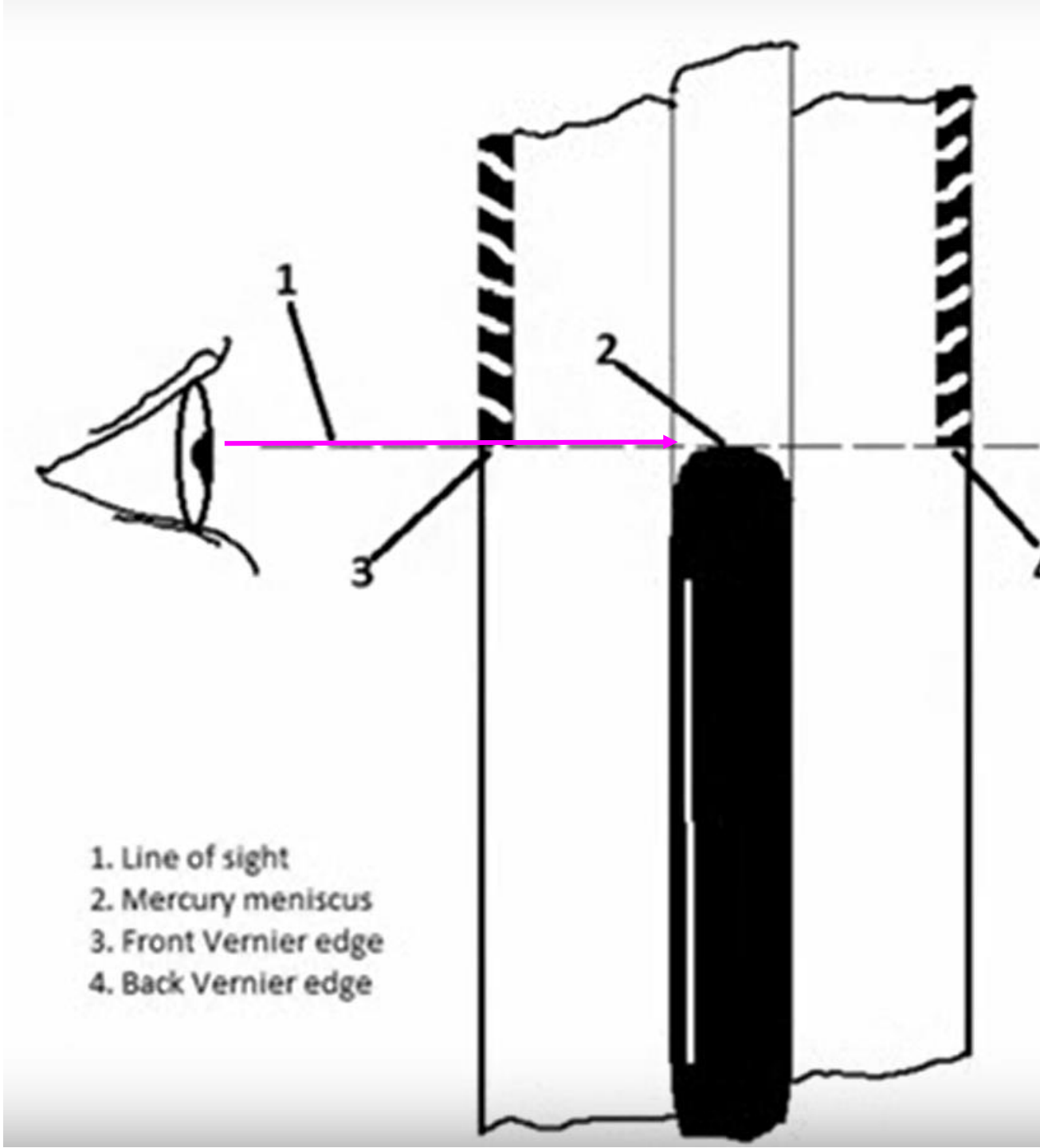
Adjust your eye-height to correctly view the barometer mercury level at the bottom of the slider



Reading our barometer scale:

The green lines were added to show the current reading.

What is it?

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Measurement: 745.4 mm

(sorry, the 700 label isn't visible in this photo)

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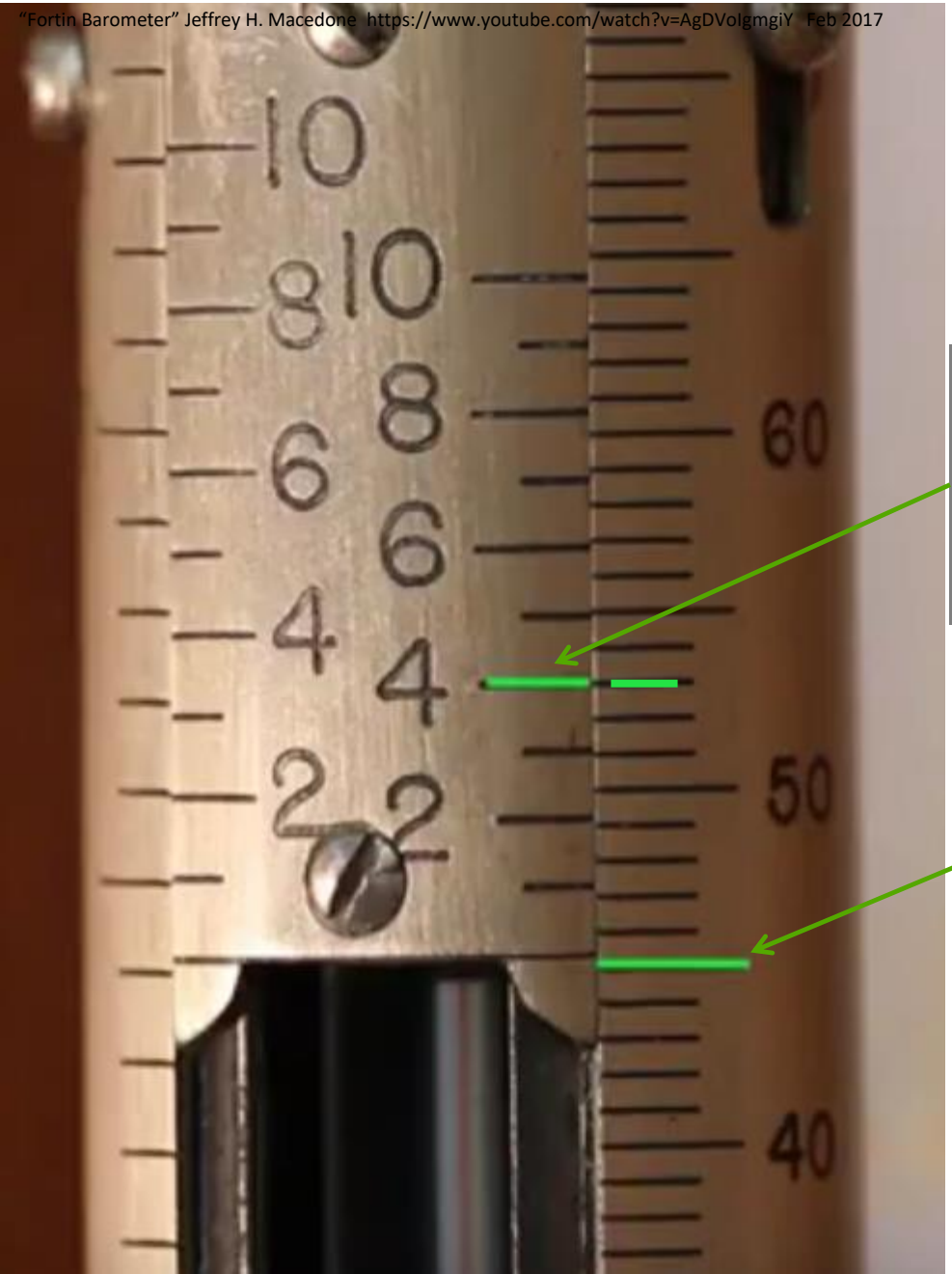


The green lines were added to show the current reading.

What is it?

Slider → shows the decimal part of the measurement → best matches 0.4 mm

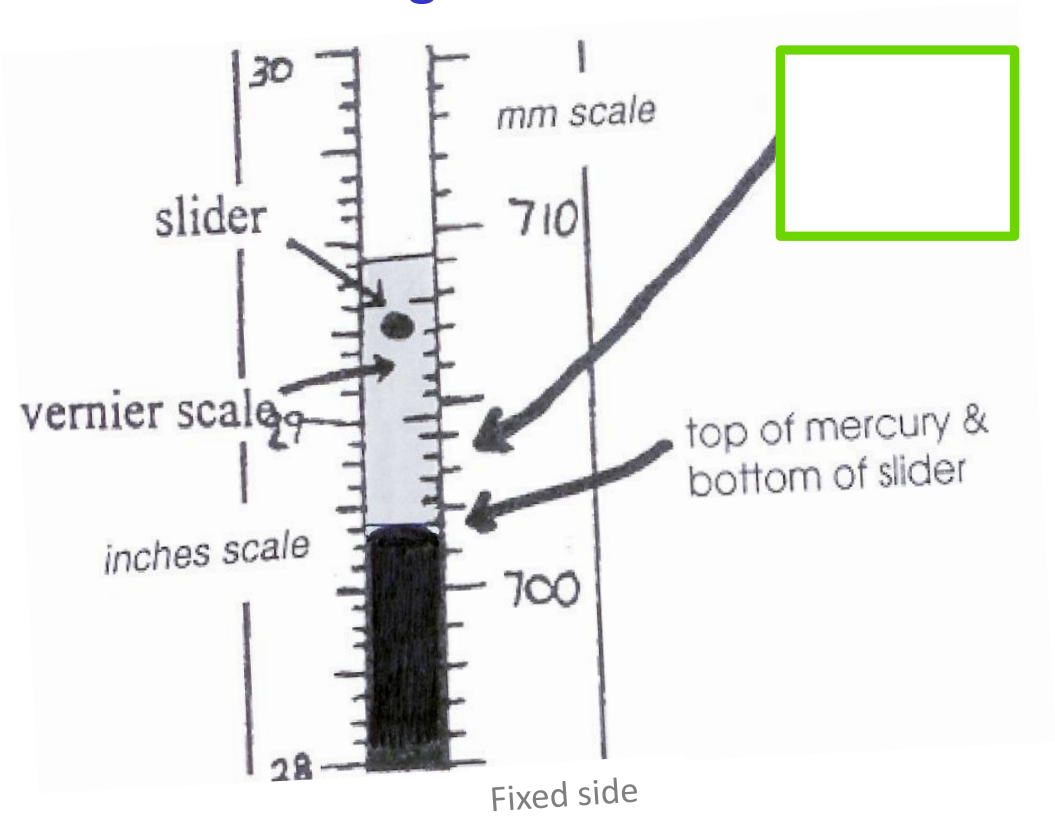
Fixed side → shows the whole number part of the measurement → bit more than 745mm (between 745 & 746; note only the 45 is shown in this photo).

Measurement: 745.4 mm

(sorry, the 700 label isn't visible in this photo)

Wx Proj Data Collection Practice /Review

What's the value on the Handout diagram?



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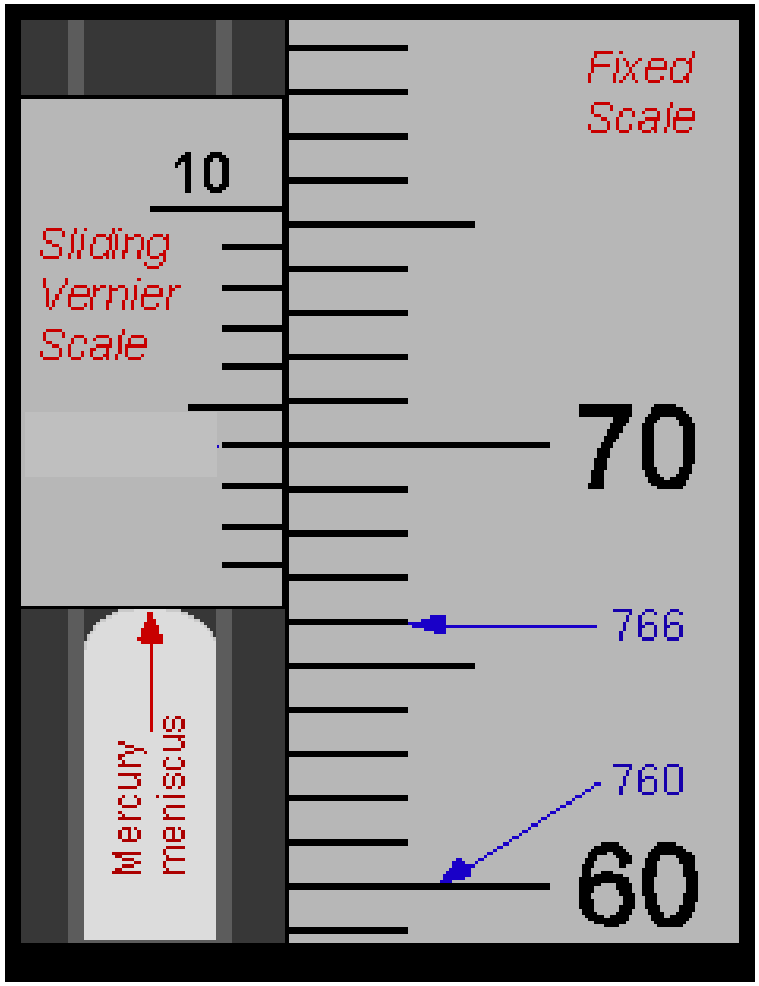

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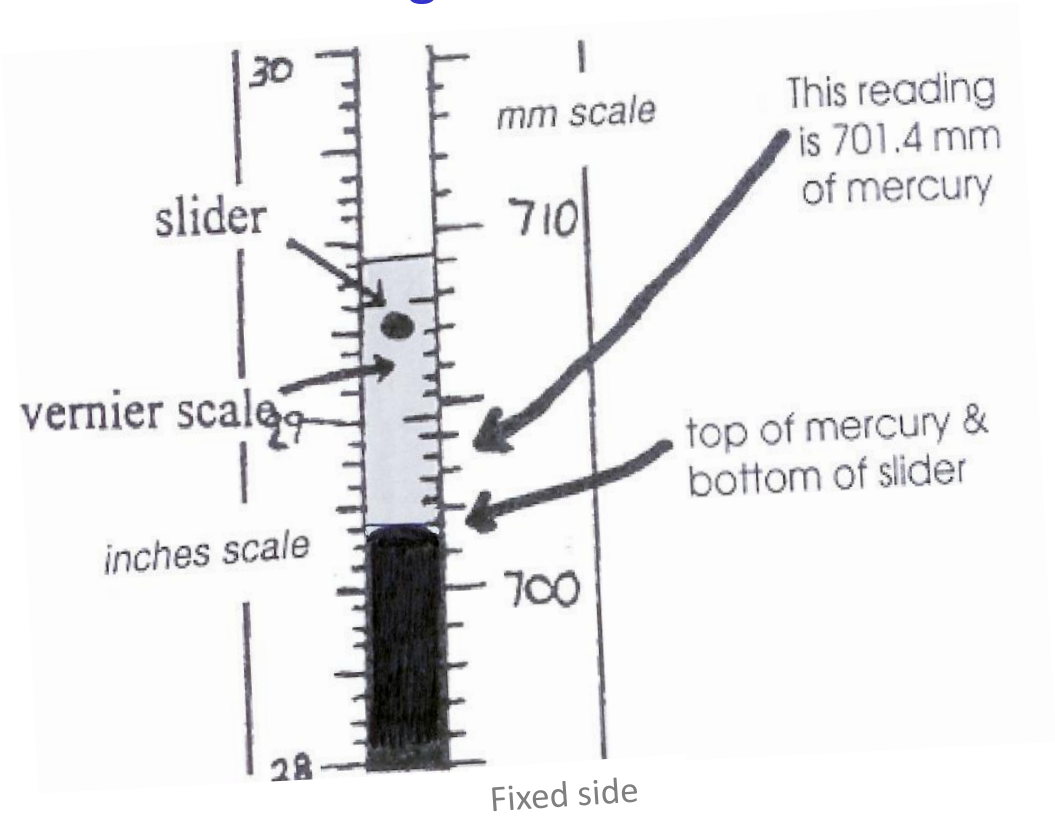
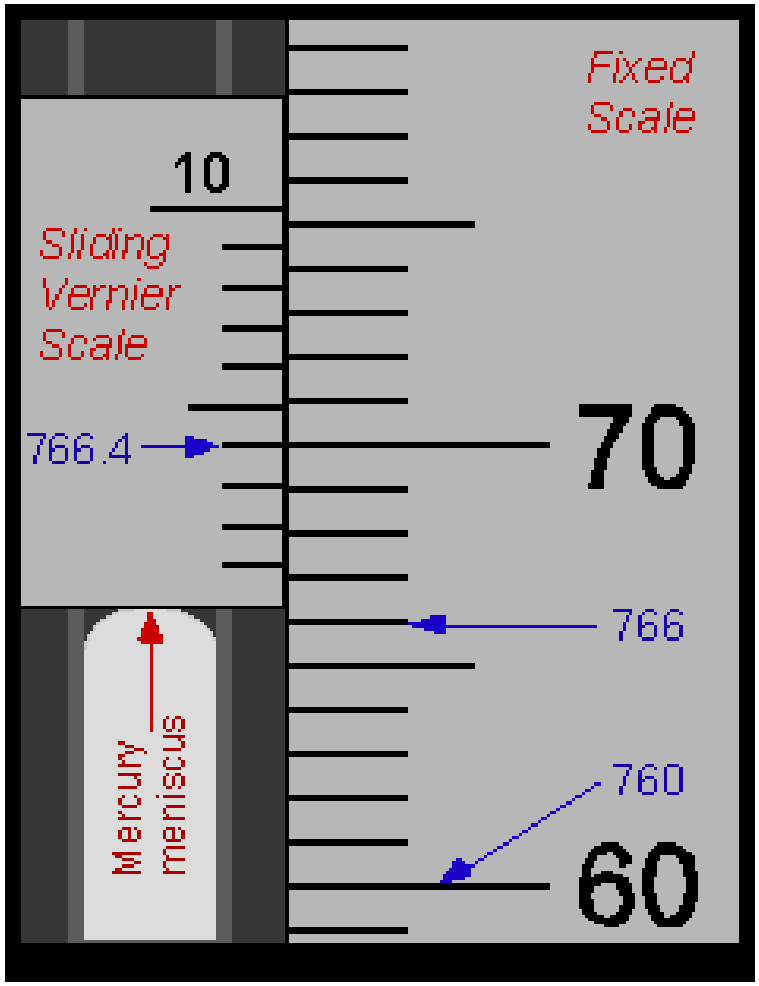


It is only by coincidence that all these examples are XX.4 readings

What is this value?



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Wx Proj Data Collection Practice

(Use your sample data collection sheet to make notes)

- Visit the roof / practice the data collection sequence

- Consider roof safety requirements

  High wind /thunder /lightning ← don't go out!!

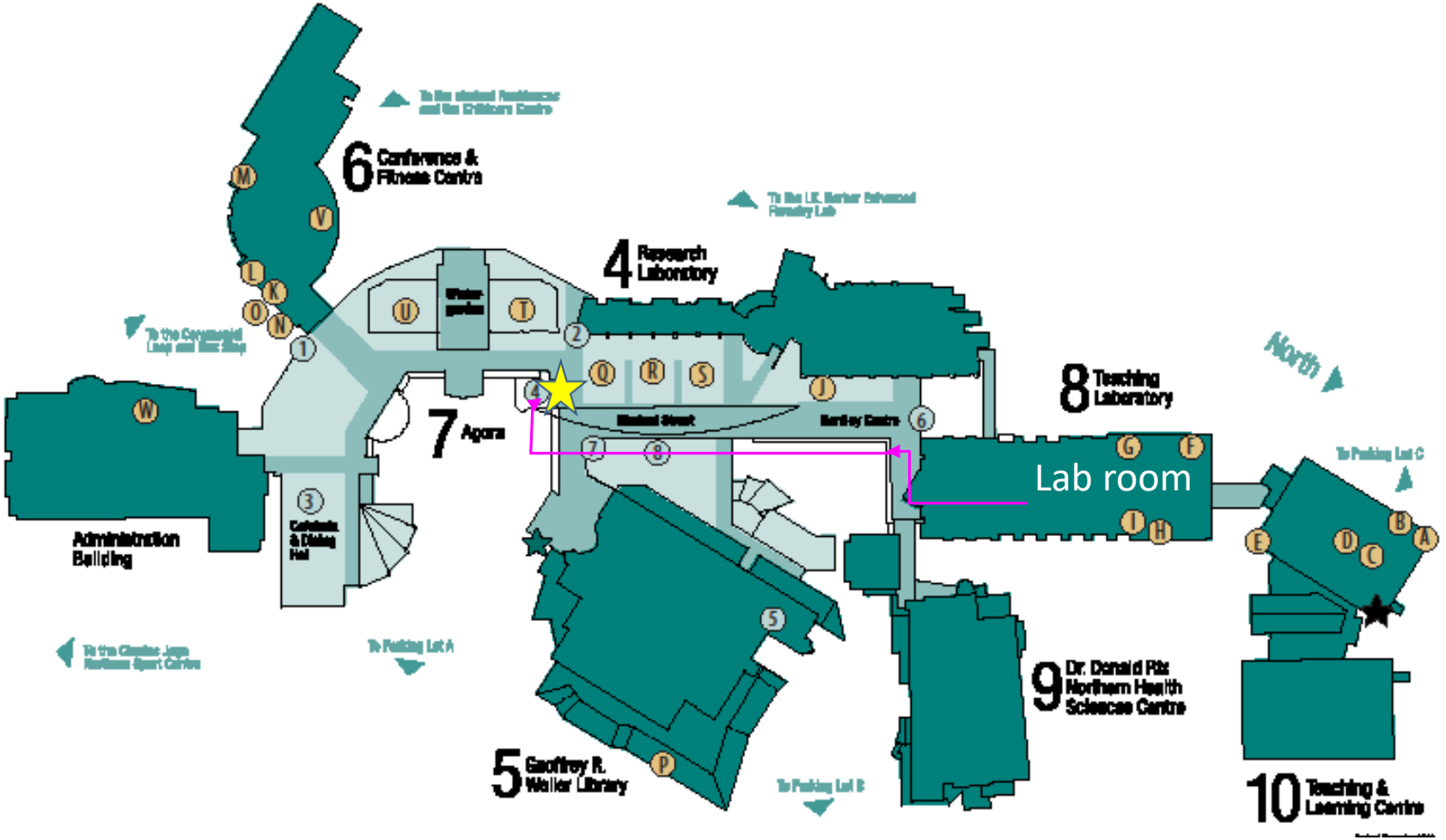
  Don't go beyond any patio railings

- What's the best order for making your measurements?

  It depends -- affected by the weather we get

Get the key: UNBC Security Desk =

Only 1 person /group. Bring your student card, must leave it with Security while using the key



Weather Observation & Analysis Project **Screen X Instrument #** *Example Data Collection Sheet*

DATE	TIME	TEMPERATURE			HUMIDITY Note instrument type in RH column			PRECIPITAT-ION			SKY Condition & CLOUD							WIND				PRESSURE			COMMENTS
											SKY	Cloud type: Use abbreviations. For layers you cannot see report n/a			Amount (8^{th}s)			Visual Observation		UNBC Weather Station					
Entered from earliest to latest date & time		Max Temp. (°C)	Min Temp. (°C)	Present Air Temp. (°C)	Wet bulb Temp. (°C)	Dry bulb Temp. (°C)	W = Weksler B = Bacharach RH (%)	Snow (mm) Ruler measurement	Water equivalent snow (mm)	Rain (mm) T = Trace From rain gauge	CLR FEW SCT BKN OVC OBSCD MISG	low	mid	high	low	mid	high	Direction Bearing as an 8 point compass	Beaufort number	Direction Azimuth as degrees (°) from north	Speed (m/s)	Barometer (mm Hg)	Barometer Temp. (°C)	Corrected Pressure (hPa)	Use last & as needed

5 4-6 4-6 4-6 4-6 1 2 3

Recommended Data Collection Order

(works most of the time)

Each student will calculate their own

Each student will calculate their own

Each student will calculate their own

The original Data sheet always stays on the roof!

The Weather Report data sheet remains on the roof clipboard at all times