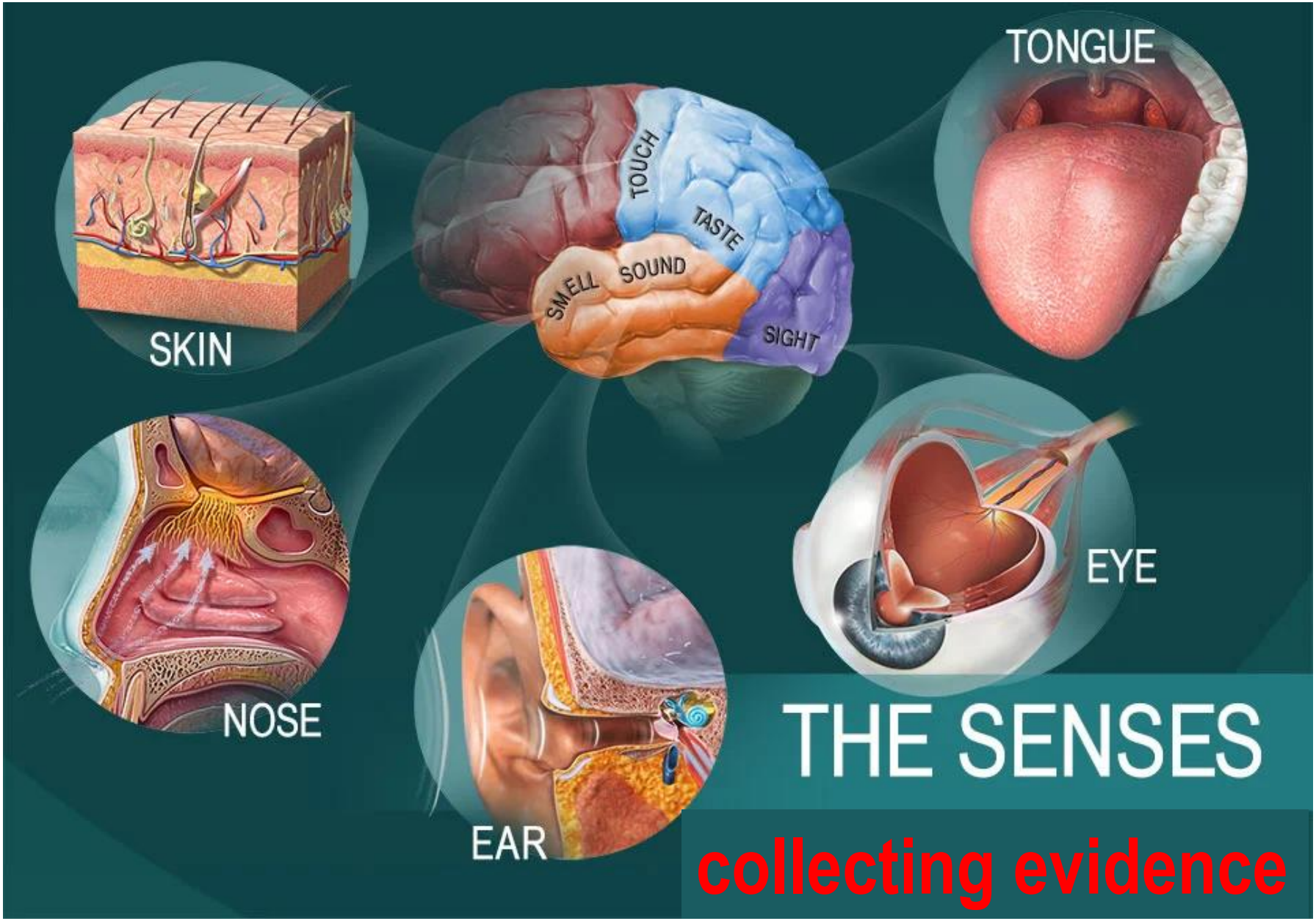
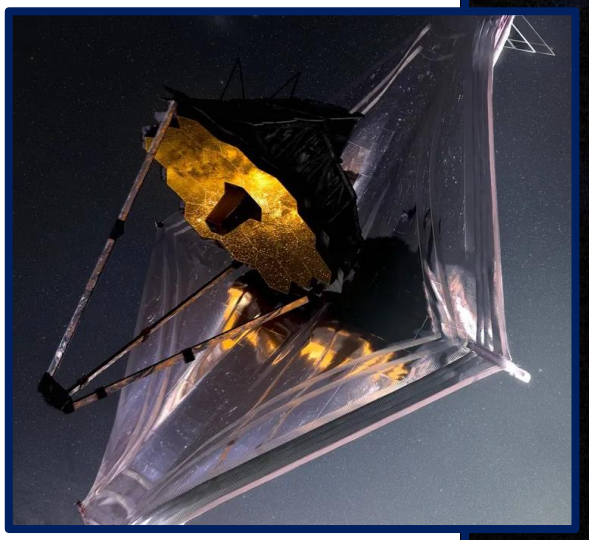
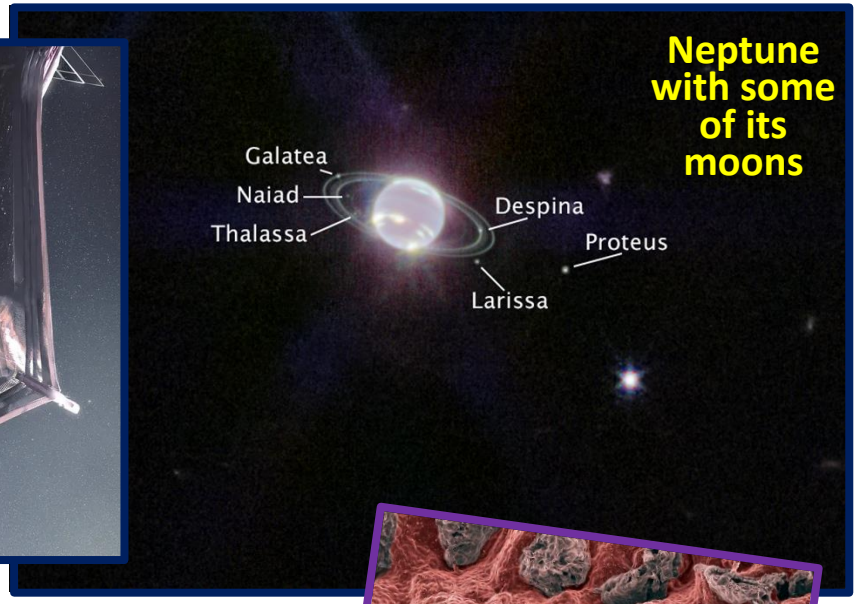

TONGUE
SKIN
TOUCH
TASTE
SMELL
SOUND
SIGHT
NOSE
EAR
EYE
THE SENSES
collecting evidence

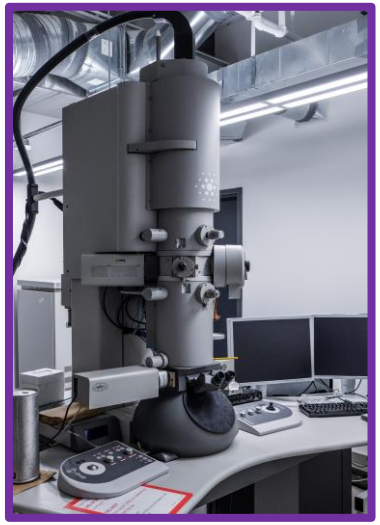
Instruments collecting evidence

James Webb Telescope

helps observe VERY FAR AWAY objects

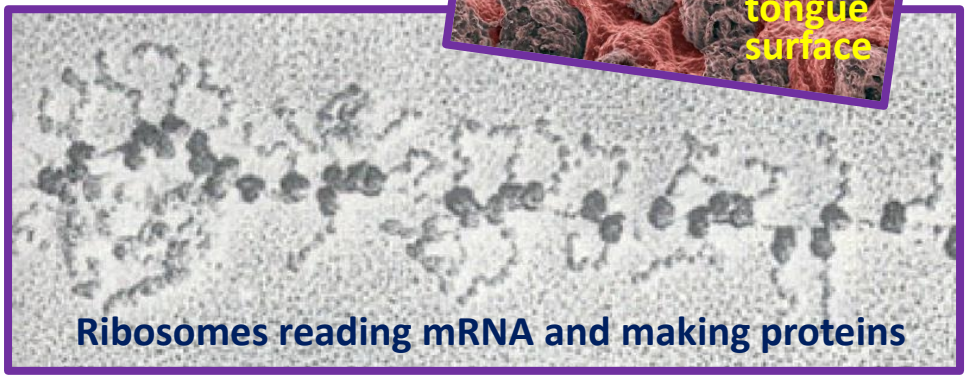




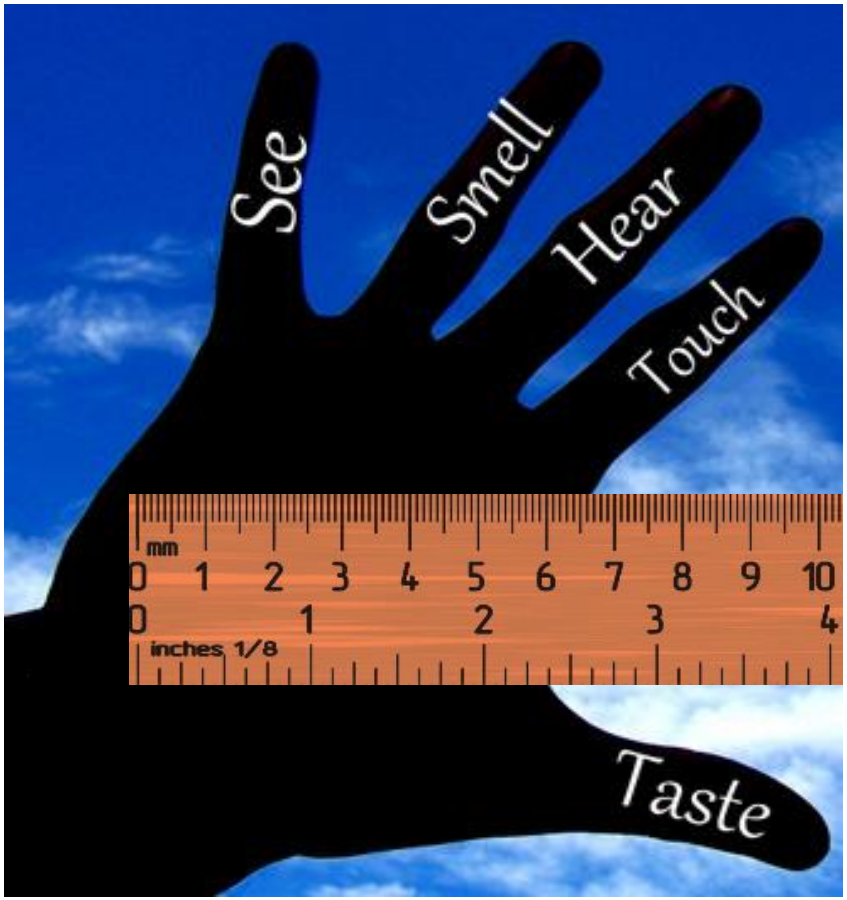


Electron Microscope

helps observe VERY SMALL objects



Evidence is based on Observation



- **<u>Observation</u> is describing an object or event using your five senses (*what you see, hear, smell, taste, touch*) or measurement (*numbers*).**
- **Modern science employs *sensors* and *detectors* to make observations.**

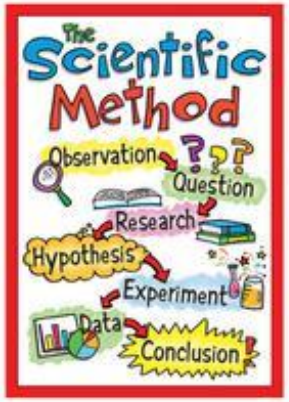
- **<u>Information gathered</u> during an observation is called data (singular form *datum*).**

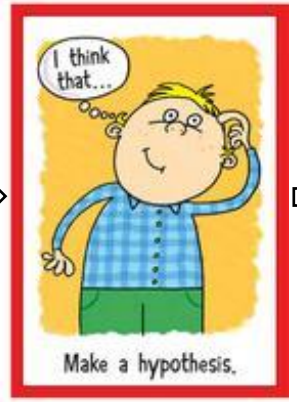
INITIAL OBSERVATION

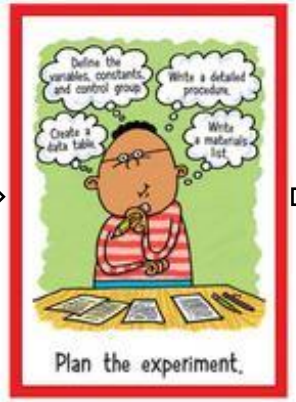
WONDER

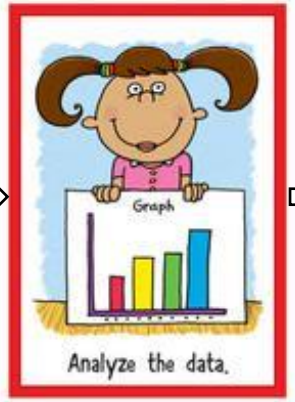
RESEARCH

HYPOTHESIZE









PLAN

EXPERIMENT

DATA

ANALYSIS

ADDITIONAL OBSERVATIONS

CONCLUSION!

Describe the Elephant

Observation should NOT include opinion!

It weighs 480 kilograms.

It has large ears and long trunk.

It has gray wrinkly skin.

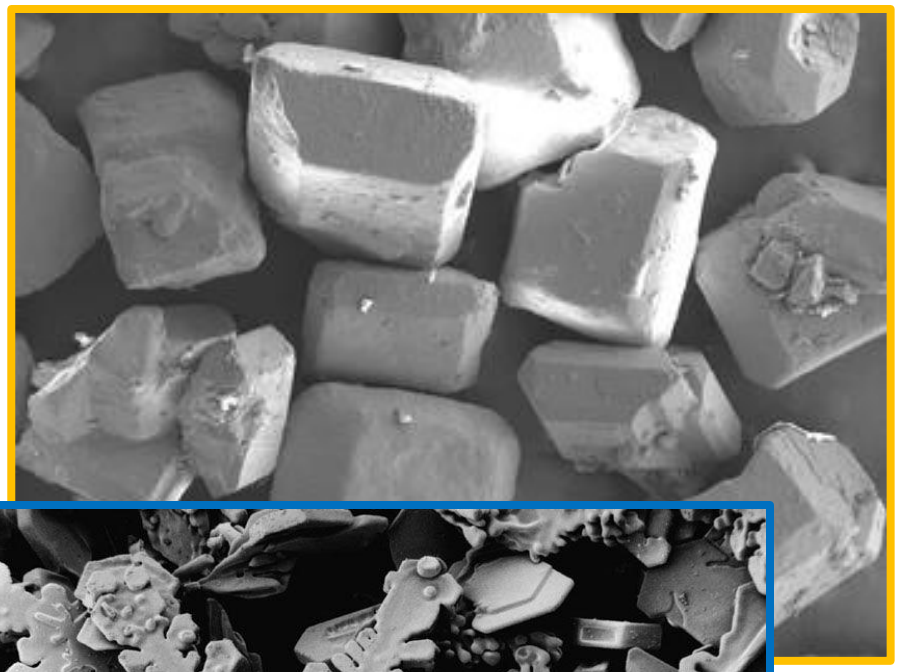
~~It is very cute!~~

It is young.

It is about 1.5 yards tall.

Describe the Crystals

TABLE SALT



SUGAR

SNOW

Qualitative vs Quantitative Data

QuaLitative (letters)

- **Descriptions** using **words**.
- Data which can be **observed** but **not measured**.
- What the object is *like*: texture, smell, taste, appearance, etc.

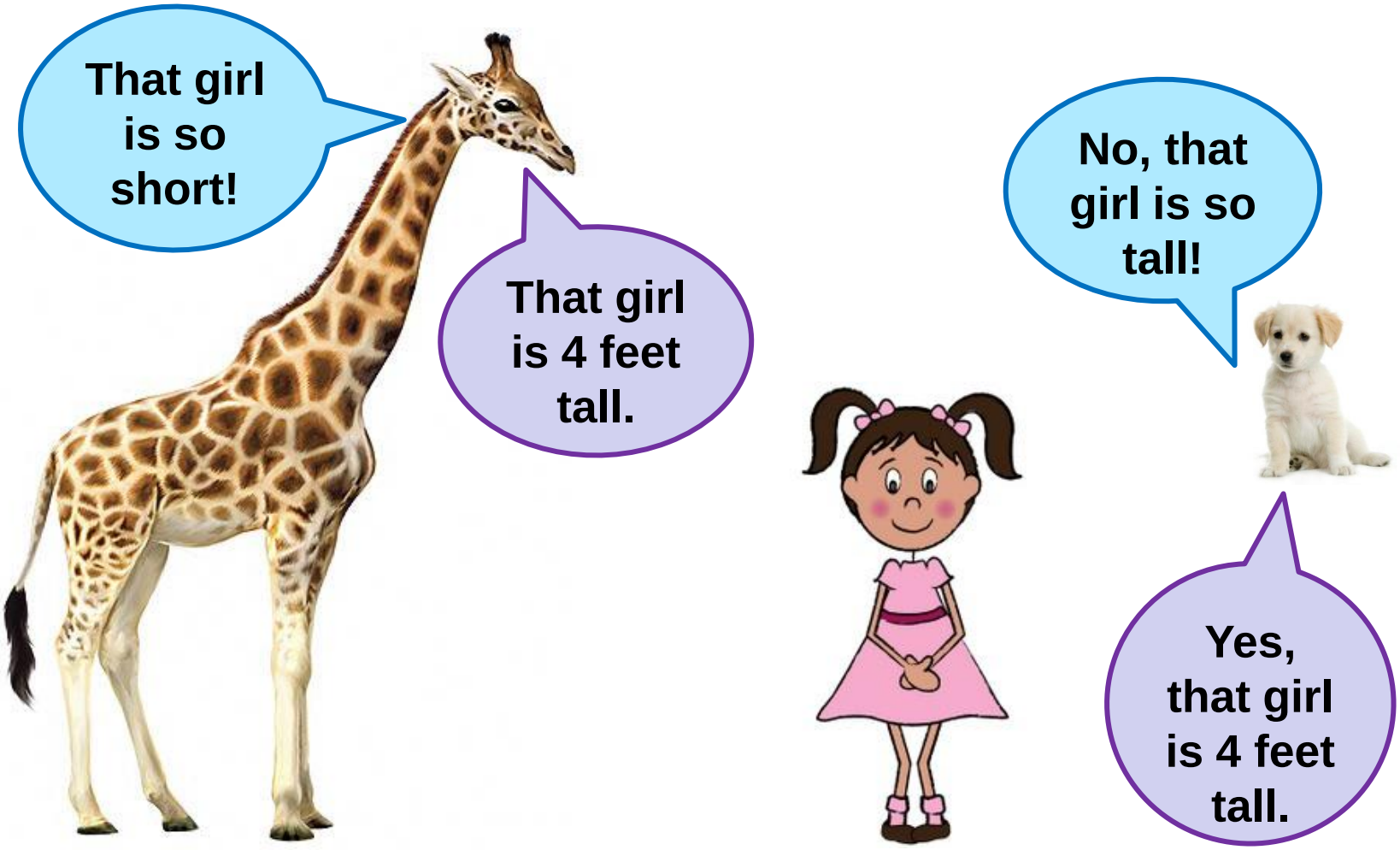
Subjective, relative

QuaNtitative (numbers)

- Specific **numbers**.
- Data which can be **measured**.
- Length, height, area, volume, weight, speed, time, temperature, humidity, sound levels, cost, age, etc.

Objective, specific

Qualitative observations are subjective



Quantitative observations are objective

Observation depends on observer

- Location and size of an observer
- Observer limitations

can only see visible light

can see ultraviolet light