*THE HISTORY OF MEASUREMENT

WHAT EXPLORING TECHNOLOGIES IS BASED ON

*WHY DID SOCIETY NEED MEASURING?

- To explain / define / specify things to each other in a standard way
- International comparisons needed to be equal in reality
- Commerce needed it (describe size, amounts, land ownership, trade)
- Technological Design needed it (building, tools, products, surveying)
- Artists needed it (building, statues, pyramids)

FIRST MEASUREMENTS

- ancients started using arms and feet for measuring distance, it was only natural that they also thought of using fingers, hands and legs

CUBITS

- earliest recorded unit of measure was the cubit of @ 2000 B.C.
- length of a human's forearm or the distance from the tip of the elbow to the end of the middle finger @ 18 inches
- useful, available, convenient, and couldn't be lost, but far from a fixed dimension or standard

1 FOOT CAN BE DIFFERENT

*MEASUREMENT "GROWTH"

- Each succeeding civilization added to society's knowledge, building an accumulation of measuring standards and techniques
- Some contributed weight measures, time measures, methods for surveying big areas of land and establishing boundaries

KNOWN DEVELOPERS

- BABYLONIANS
- GREEKS
- EGYPTIANS
- ARABS
- NATIVE CULTURES

*ESTABLISHING SYSTEMS

- CULTURAL ITEMS (SEEDS, STONES, BEADS, BODY PARTS) SET ‘STANDARDS’
- CUBITS
- PRECIOUS METAL WEIGHTING SYSTEMS
- 1300’S ENGLISH STANDARD FIRST SET
- IMPERIAL
- METRIC

MID - 1600’S

- SCIENTISTS / TECHNOLOGISTS STARTED DEFINING IMPERIAL STANDARDS (SET BY “IMPERIAL” ROYALTY)

LATE 1700’S

- Napoleon’s time – French determined metric standards
- Had a hard time getting people to use it as they were already familiar with imperial method

*IMPERIAL SYSTEM

- The "old" system of measures was officially used in Canada until 1976.
- Examples of imperial units includes: inch, foot, yard, mile, pound, gallon, and pint.

*METRIC SYSTEM

- Also called the System International (SI) system, the metric system is based on each unit being subdivided into tenths (a decimal move). Examples of metric base units include: meter, gram, liter, and second.

HOW METRIC WORKS

- *Base 10* Metric is broken down unit by unit in increments of 10.
- our numbering system is also Base 10 (thousands can be broken down into 10 hundreds, hundreds can be broken down into 10 tens, ...), it makes metric very compatible with our numbering system (the actual measurements).
- Another way to describe metric is as a decimal system.

*METRIC PREFIXES

- K - KILO
- H - HECTA
- DA - DECA
- BASE UNIT (METRES, GRAMS, LITRES)
- DI - DECI
- C - CENTI
- M - MILLI

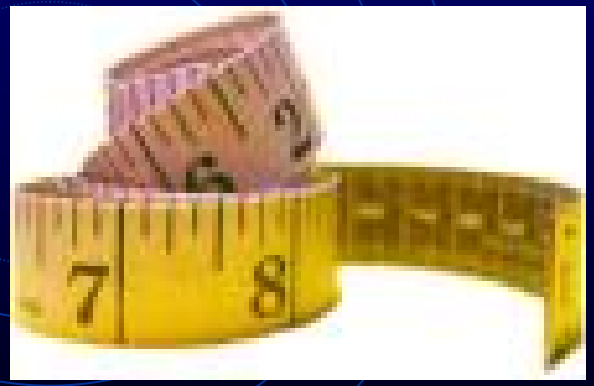
*NOW

- Many people use both in everyday life in Canada – we are a ‘metric’ society, however many trades people, designers, artists, builders work in imperial measures
- Most people have both sets of tools in Canada depending on what thing they are working on
- Canadians are expected to know both
- United States uses Imperial mostly

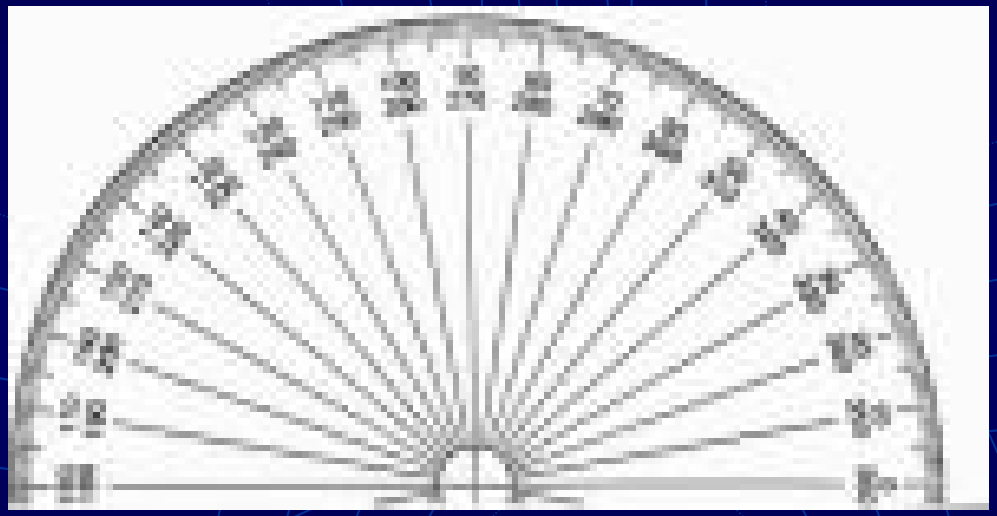
*POPULAR MEASURING TOOLS

- RULER OR TAPE MEASURE
- PROTRACTOR
- WATCH / TIMEPIECE
- THERMOMETER
- WEIGHT SCALE
- VERNIER CALIPER
- MICROMETER
- SONAR / LASER
- COMPASS, SEXTANT, PARALLEL RULER
- SATELLITE TRIANGULATION

RULER / TAPE MEASURE



PROTRACTOR



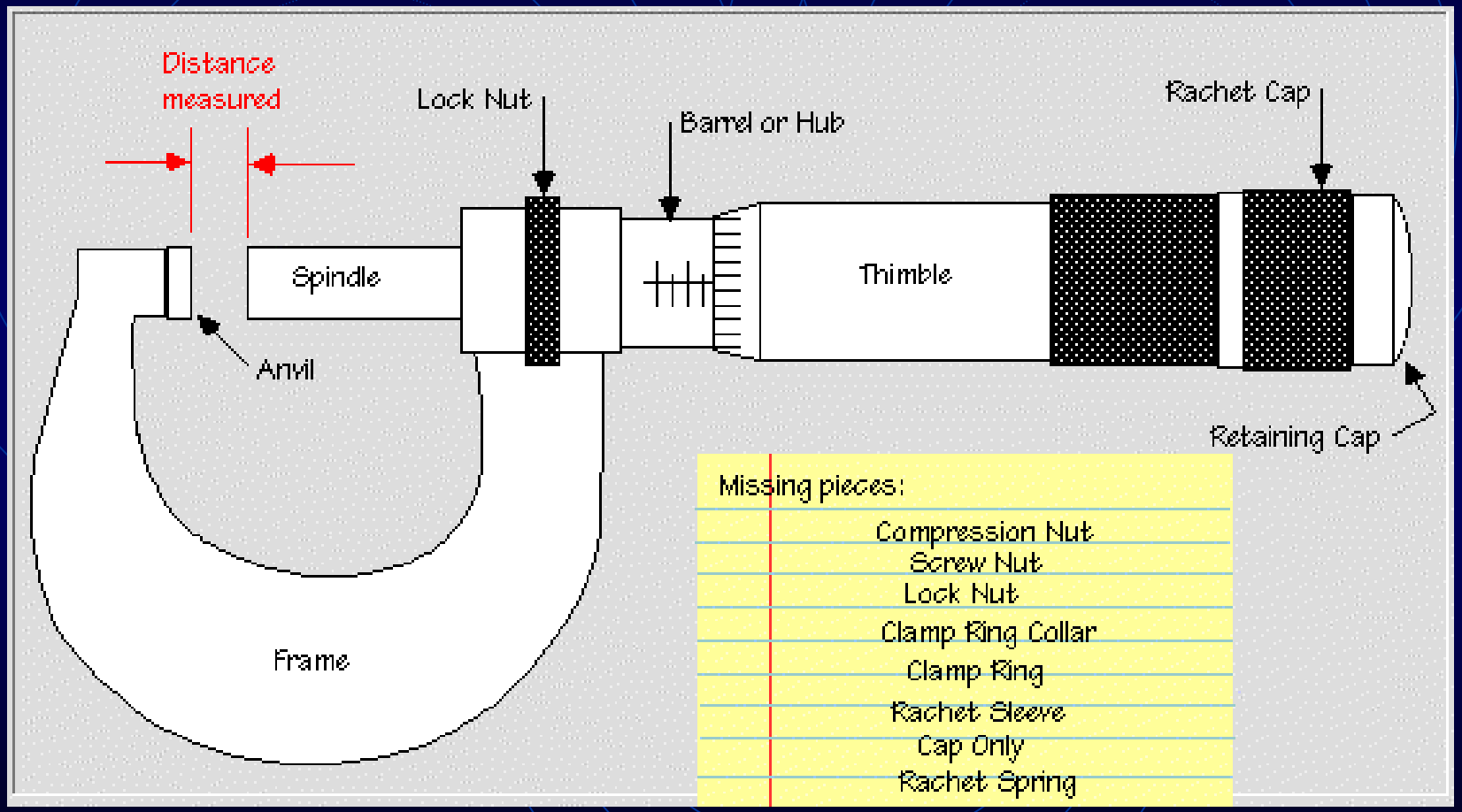
WATCH OR TIMEPIECE

THERMOMETER

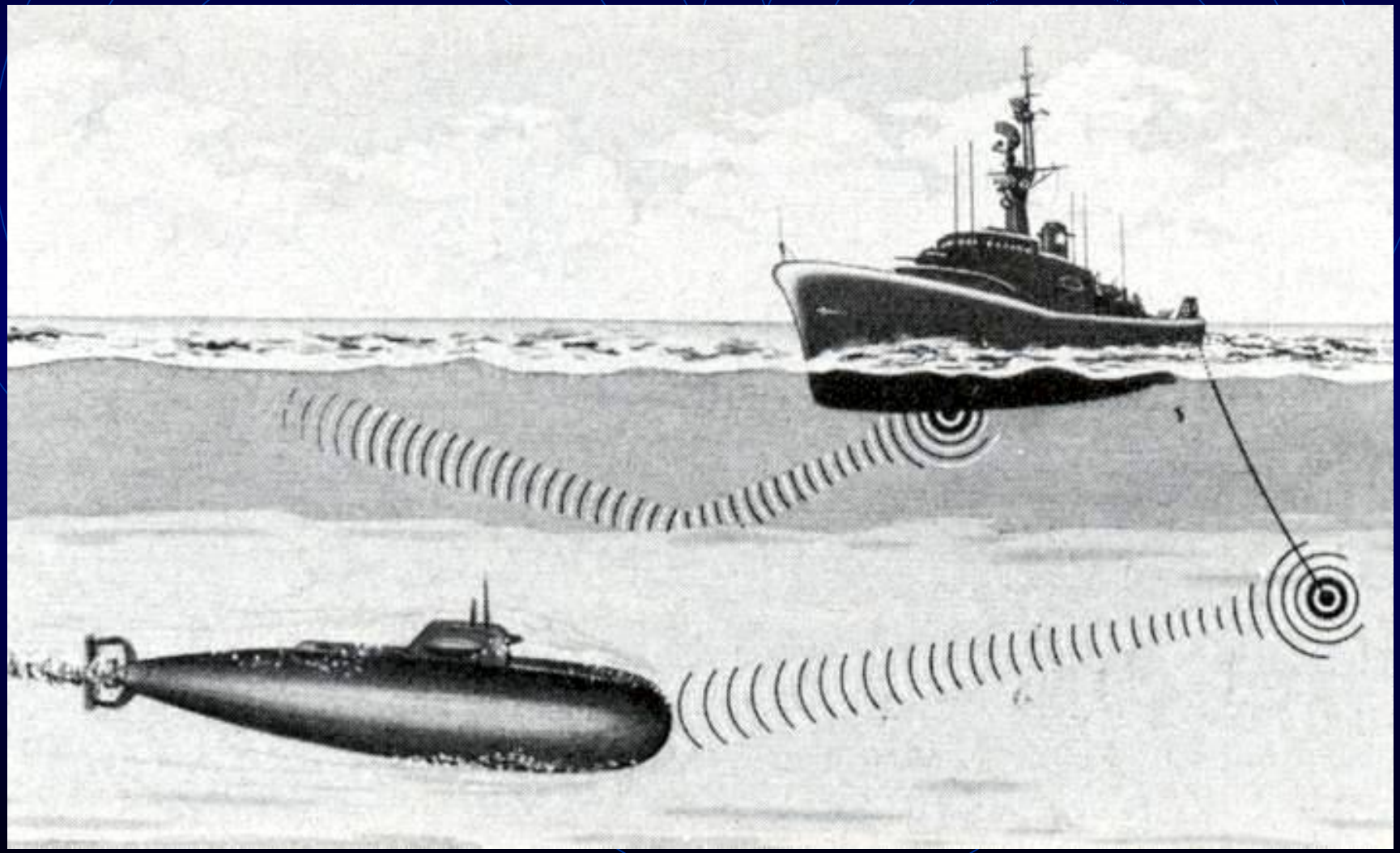
WEIGHT SCALE

VERNIER CALIPER

MICROMETER


Distance measured
Lock Nut
Barrel or Hub
Rachet Cap
Spindle
Thimble
Anvil
Retaining Cap
Frame
Missing pieces:
Compression Nut
Screw Nut
Lock Nut
Clamp Ring Collar
Clamp Ring
Rachet Sleeve
Cap Only
Rachet Spring

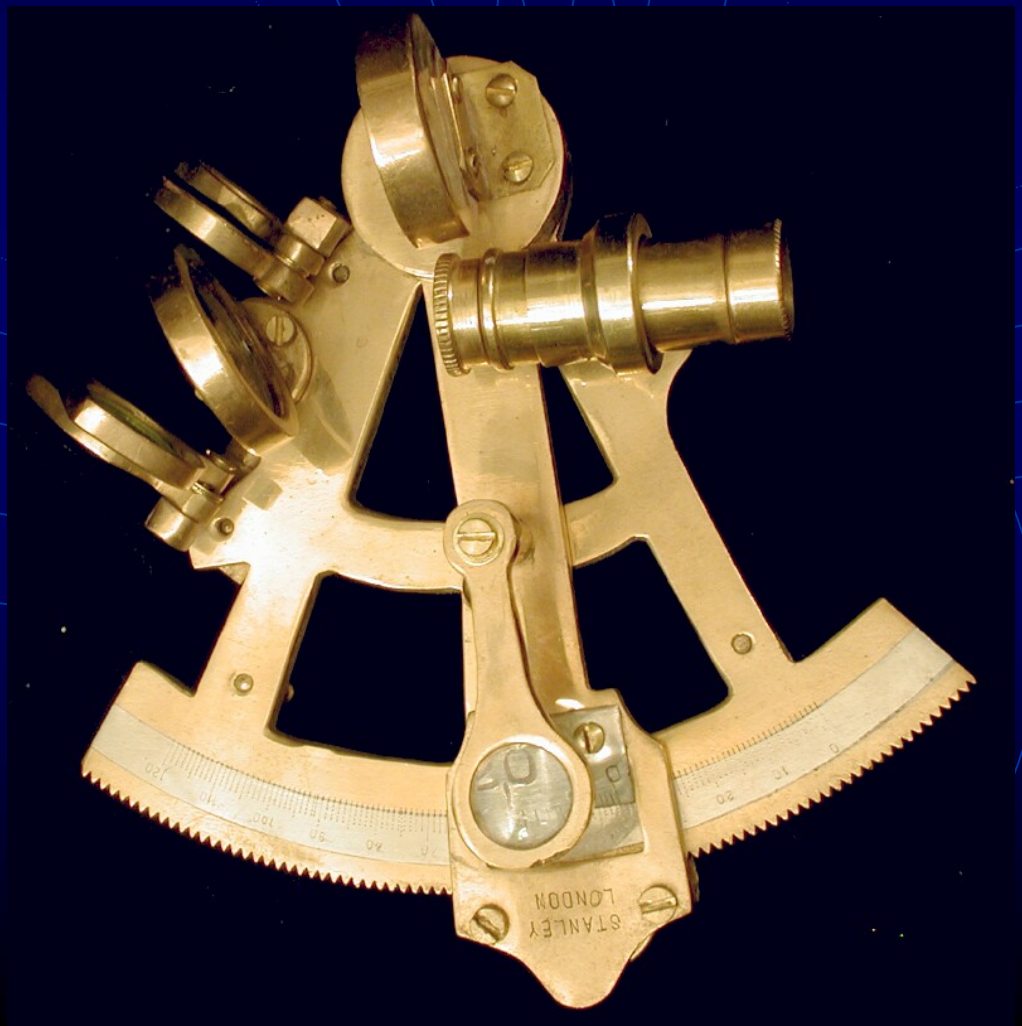
DEPTH SONAR



LASER MEASUREMENT

COMPASS

SEXTANT



PARALELL RULER

SATELLITE TRIANGULATION