

## Scientific Data – Teacher Notes

We love our sunburnt country but droughts and flooding rains affect our landscape. Recent warming of the Pacific Ocean appears to be responsible for increasing the frequency and intensity of ENSO (El Nino Southern Oscillation) events. Under El Nino conditions warm water from the equator is blown towards South America increasing the chance of drought conditions in Australia. The opportunity for bushfire consequently also increases.

Research to date suggests that La Nina events when rain-bearing winds approach the east coast of Australia are becoming rarer but the rainfall is becoming more intense. More research is necessary to build more accurate models of what is happening.

Aboriginal belief is that natural disasters such as Cyclone Tracy which devastated Darwin on Christmas day are the direct result of their ancestors being angered by poor behaviour of mankind.

When we discuss changes in climate we cannot just give general statements such as “I think it is getting drier” or “This must be a drought”. We need to give information and measurements in a way that can be understood the same way by everyone across the world.

Science requires data (information and measurements) that can be:

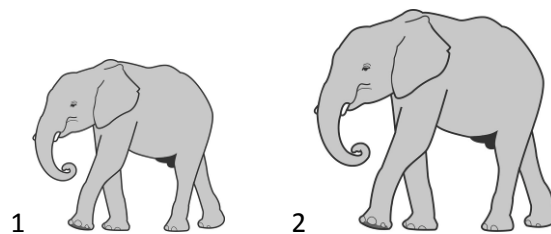
**OBSERVED** using four of your five senses.

Which four senses do we use? **Sight, touch, hearing and smell.**

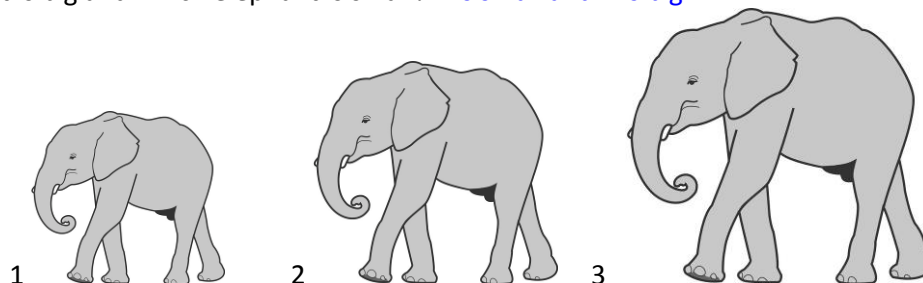
Which sense do we not use and why? **Tasting can lead to poisoning and disease.**

**MEASURED** using objective measurements and not subjective measurements.

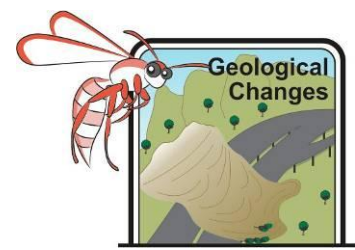
Subjective measurements describe the feelings and ideas of each particular person. They aren't necessarily the same for everyone. E.g. big and small, nice and nasty or hot and cold.



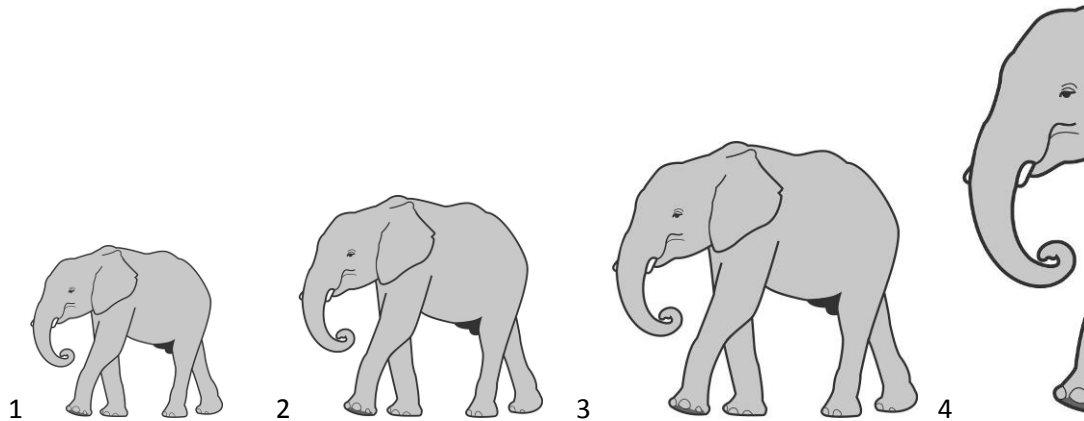
Which elephant is big and which elephant is small? **1 is small and 2 is big.**



Which elephant is big and which is small this time? **You can only say that one is bigger or smaller than the other. There is no standard size. To elephant 3 elephant 2 is small while it would appear tall to elephant 1.**



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Which elephant is big and which elephant is small now? **Again size is relative to comparison with another elephant.**

Objective measurements use International standards measurements such as metres, degrees Celsius, kilograms and seconds.

If we have a standard measurement for the first elephant of 1 metre, what could we estimate as the height of elephant 2? **About 1.5 m**

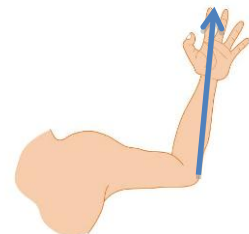
What could we estimate as the height of elephant 3? **About 1.75m**

What could we estimate as the height of elephant 4? **Insufficient information.**

Ancient Egyptians used the length of their arm from the tip of their fingers to their elbow as the standard measurement of **1 cubit** and the standard width of one finger as **1 digit**. Ask the class to measure the length of the side of the classroom in cubits using their own arms and measure using their rulers. (The length of benches or tables out in the yard might be also be measured on a fine day with a fine class). The results can be compared and decisions made as to whether using internationally standard measurements are more accurate and precise.

Length of **whatever** in cubits and digits \_\_\_\_\_  
Class readings ranged from \_\_\_\_\_ to \_\_\_\_\_

Length of **whatever** in metres and centimetres \_\_\_\_\_  
Class readings ranged from \_\_\_\_\_ to \_\_\_\_\_



Which method of measurement is most accurate and precise? **International Standard Measurement**