**How to Read a Metric Vernier Caliper**

A vernier caliper is used to measure an object by pinching it gently between the sliding jaws and is read by adding up the results of the main scale and the vernier scale. On the vernier caliper shown below the main scale is in millimeters. The vernier scale can be visualized as the distance between two ticks on the main scale STRETCHED OUT. The entire vernier scale represents the distance between two ticks on the main scale, which is only one mm. The vernier pictured below is capable of measuring to the nearest 0.05 mm because there are 20 ticks on the vernier scale.

So, what is the measurement this vernier is showing?.

To start, notice the ZERO LINE on the vernier scale is just past 13 on the main scale, so you know that this measurement will be something slightly over 13 mm but not quite 14 mm.

We can read off the exact measurement, between 13 and 14 millimeters, by looking for where one of the vertical marks on the main scale EXACTLY lines up with one of the vertical marks on the vernier scale.

In this case, they exactly match up on the 5 on the vernier scale. But 5 what?.

There are two ways of getting to the answer. That 5 is equivalent to 0.5 mm, it is half of the stretched-out millimeter the vernier scale represents. So the reading here is 13 mm plus 0.5 mm = 13.5mm.

Another way to get the answer is to notice there are 10 tick marks on the vernier scale between the zero and the 5 that is matching up with the main scale, and on the vernier notice an extra marking on the right, 0.05 mm, which is the value of each of the tick marks on the vernier scale. 10 tick mark spaces = 10 x 0.05 = 0.5 mm! Add this to the 13 on the main scale and you get 13.5 mm.

**Finally, what about if the line between the 5 and the 6 on the vernier scale matched up? You can read that in two ways:**

That tick between 5 and 6 is 5 and a half, and since the 5 is read 0.5 mm and 6 would be 0.6 mm, then the mark between them is 0.55 mm. We would have 13 mm from the main scale plus 0.55 mm from the vernier scale =13.55 mm.

We could also come to the same answer by counting the ticks between 0 and the mark between 5 and 6 on the vernier scale, which is 11 ticks, and multiplying this by 0.05, the value of each tick, which would be give us 0.55, and adding this to the 13 from the main scale, to get 13.55 mm.