Hello, here we have a simple circuit with two resistors, we are going to replace this resistor with an inductor and then a capacitor. Further demos will show what the difference is. A purely resistive circuit here, we have a function generator to give us a sine wave source like an AC supply and an oscilloscope which has two channels so it can take two inputs and give us two waves. We have coloured the lines by right clicking on them, going to properties to change the colour, so the output will change on the oscilloscope, so you can identify it. When we measure voltage, it is always across something, it is the potential difference between before and after the resistive element because we have a drop across here. But when we measure current, we do not measure it across something conventionally because the current is the flow of electrons so we need to measure it through something so if we have an ammeter, we would put it inline. But for this oscilloscope we have a wee trick here, there is a 1ohm resistor and we measure the voltage across it, then we can symbolise current. We are doing this to see how these waves compare for voltage and current. We will see the differences greater in inductive circuits and capacitive circuits. So we press run, we click on our oscilloscope and it looks like it is going very fast but we can stop it and then have a look. We can see our two waves, we have got in red on channel A, voltage one volt per division which can be changed. We don’t change the value of it, that is half a volt per division, so it is still representing the same thing. The same with channel B, we could have one on top on each other but then we would not see where it is. The x-axis is time, which could be changed, that is showing one wave which is brilliant. The real oscilloscope would operate in the same way. This demonstration if giving the understanding we need. I you get access to a software package you can try this, but it is not a requirement MultiSIM can be bought as a student version or can be used in the college. So here we have the waves are happening at the same time, they are crossing the axis together, they are peaking together, so we can say the voltage and the current in a resistive circuit are in phase. That is what we are trying to gather from this demonstration

Thank you for listening.