

Ideas:

1. How a diode works
2. How the device figures out what the circuit component is

My summarised understanding of how the component tester works:

Based on my reading, there are three key phases for the component tester, there's the signal input, which is either a small application of ac or dc, the measurement of the response from this, and then finally there's the algorithm that takes these measurements and decides what the component must be, and it might send back that it couldn't read the component if the device doesn't match anything in its decision tree. The measurement part is really the interesting and important part, as well as which measurements correspond to which devices. Measuring resistance is easy, it can just run a current through with a specified voltage and  $V=IR$  spits the resistance right out. To get a measure of capacitance is more complicated, and one of the proposed solutions is to use an AC signal and due to the fact that the voltage across a capacitor will lag the current by 90 degrees, this shouldn't be too hard to measure. The device can also tell if the component is polarized, and run current both ways to tell if the device is a diode or even a specific kind of diode. The last important quantity to measure would be the inductance. To get a measure of the inductance the tester must get a measure of the reactance. The reactance is a bit like resistance, except very unlike resistance in that energy is not leaving the system but is instead stored as a magnetic field. Reactance is the quantity we would care about and not impedance, because impedance includes resistors and we only care about how out of phase we are with the current we supply.

Citation:

Al Williams, et al. "How Do Those Component Testers Work?" *Hackaday*, 1 Oct. 2019, [hackaday.com/2019/10/01/how-do-those-component-testers-work/#:~:text=If%20you%20haven't%20seen,the%20value%20of%20the%20part](https://hackaday.com/2019/10/01/how-do-those-component-testers-work/#:~:text=If%20you%20haven't%20seen,the%20value%20of%20the%20part).