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**Hypothesis: The superposition principal states that a state function can be expressed as a linear combination of it's normalized eigenstates. When a measurement is performed, the statefunction collapses to one of these eigenstates.**

**Problem: The measurement performed above is a quantum measurement, however, humans can only observe classical information. How would you "see/observe" the result of the above collapse?**

**Reasoning:**

Quantum mechanics is an amazing theory which describes the reality of the universe in most accurate way possible. It states, unlike in classical mechanics which tells that by exact certainity what will happen next or in other word everything is certain, that to know the true reality of nature we have look at it in probabilistic way instead of absolute certainity. But the weird thing is that in microscopic world, nature somehow knows when it is being observed and makes the probability function, which is called wavefuntion (|Ψ|), to collapse into a single state i.e. it makes everything certain for the moment it is being observed. QM states that you cannnot observe something in microscopic world wihout actually affecting it. And it has been proven with various experiment such as delayed choice experiment.

Coming to the actual question, there has been many ways to confirm the collapse of wave function in microscopic world, like delayed choice experiment (I know it’s not something I should mention at first, but it is what needed to confirm the collapsing of wave funtion). But I won’t be discussing Delayed choice experiment here. Instead I’ll explain it using the double slit experiment. So the thing let’s say the you are throwing a beam of of electron on a double slit. And you are observing when it’s hitting on a photolithic plate. Now, the thing is if you throw electrons even one by one if some how passes through both slit but upon observing on the screen it’s collapses into one single electron resulting just one spot, which somehow says that electon’s wavefunction collapsed. But this is not the actual catch we’re seeing because it’s also possible in Classical Mechanics. But if you do this experiment again and again then you’ll get an interference pattern just like that of the wave nature which show dual nature of electron and it’s passing through both slit causing overall interference pattern, which states that electron was in superposition with both slits i.e. passed through both slits and resulted in one at the screen.

Now to test this theory again, another thing which you can do is to place detectors at both the slits which determines which slit is the electron passing and when you’ll observe the interference pattern what you’ll see is it’s acting like a particle i.e. the electron is no longer in superposition and it’s wavefuntion is collapsed to single state, in other word, it’s passing throw a single slit at a time. That’s why it’s only giving a two maxima points and nothing else. Thus the proves the collapsing of our wavefuction in our classical world. So the result/effect of microscopic world easily be detected is classical observation.

**Conclusion:**

It’s so bizzare to observe this unintuitive but true effect in the nature. It’s like a coin a flipping untill you stop it and see the result wheather it’s head or tails. But if you leave it it’s starts flipping again. There may be multiple interpretation to this wavefunction collapse observation. But all it’s says that nature somehow know when it’s being observed and acts accordingly (which can be seen in delayed choice experiment).