

Chemically, table salt, Epsom salt, baking soda and washing soda are all types of salt, so for simplicity's sake I am going to refer to all the water/table salt/Epsom salt/baking soda/washing soda solutions as "saltwater."

The saltwater is moving up through the wick through capillary action. Water molecules tend to attract each other. They are also attracted to many of the molecules in the wick. This is due to very small positive and negative charges on different parts of the molecules—think of them as mini magnets. As one molecule gets pulled up the wick because of its attraction to some of the wick molecules, other water molecules get dragged along for the ride. That's capillary action.

The saltwater gets dragged through the wick up over the edge of the cup toward the dip in the middle between the cups, where it builds up and eventually starts dripping onto the plate. A lot of water evaporates during this process. When the saltwater evaporates, the water turns into a gas and goes into the air, and the salt—table salt/Epsom salt/baking soda/washing soda—gets left behind. Water that evaporates while it's still in the wick leaves the salt on the wick, where it sticks to other salt particles already there and starts to build up into the crystal-like structures that you see.

When the saltwater drips onto the plate, both the salt and the water reach the plate. Again, the water evaporates and the salt is left behind.

Crystals take time to form, so the longer they have the chance to form—the longer the chemicals are suspended in a liquid—the larger the crystal can become. If a lot of saltwater reaches the plate, it takes longer for all the water to evaporate from the plate than from the wick. That means that crystals have more time to form on the plate than on the wick, and you are likely to find larger crystals on the plate than on the wick. If less saltwater gets to the plate, then the reverse is true. Keep in mind, however, that individual crystals can bunch together. So what might appear to be one large crystal could actually be a large clump of many, many individual crystals. Thanks why it's good to examine your results with a magnifying glass or stereomicroscope (like we did in school). Crystals usually have smooth, flat sides, so anything with bumpy, convoluted sides is likely to be a group of crystals stuck to each other. It's easier to see the difference with table salt because this setup allows relatively large salt crystals to form on the plate, but hopefully there will be a few crystals of which ever salt you used that are large enough to identify as individuals. Most crystals have specific, characteristic shapes, so if you see several crystals with exactly the same shape, those are likely to be individual crystals rather than groups.

I've looked on the internet for videos that explain this, but I haven't found any that I liked because the explanation is pretty complicated. Here's one, though, that does a pretty decent job of explaining crystals in general:

<https://www.youtube.com/watch?v=PgSRAsgrKmg&t=39s>