

Yuck Science – Mix It Up: Inquiry Activity Grades JK-3

In this inquiry activity, students will mix substances that they may or may not recognize. Moving from common materials to something more exciting, students will enjoy a true moment of experimentation.

Mix It – worm goo

1. Vinegar & water
2. Vinegar & baking soda
3. Coloured vinegar & baking soda
4. Vinegar & cornstarch
5. Calcium chloride & sodium alginate

Sodium alginate is a polymer that is extracted from seaweed and kelp, which makes it edible. When it’s squirted into the calcium chloride solution, the calcium replaces the sodium and binds the polymer strands – this is called cross-linking. Buy it at Walmart!

Calcium chloride – it’s a salt. Often found as a food additive and is sometimes used as the salt applied to winter roads. Can be bought at Home Depot or Home Hardware

**Materials**

* Vinegar
* Water
* Baking Soda
* Cornstarch
* Food colouring
* Calcium chloride (dissolved in tap water)
* Sodium alginate (made the night before)
* Distilled water
* Syringes or pipettes

**Background Info:**

Sodium alginate is a polymer that is extracted from seaweed and kelp, which makes it edible. When it’s squirted into the calcium chloride solution, the calcium replaces the sodium and binds the polymer strands – this is called cross-linking. Buy it at Walmart! Make sure that you prepare this the night before the experiment. Mix roughly 1 cup of sodium alginate into 3 cups of distilled water. This won’t work in tap water, so be sure you’re using distilled. Vigorously mix the sodium alginate with a whisk (or in a blender) until all the particles are dissolved. This could take up to 20-30 minutes. Let the solution stand overnight. It will have a gel-like consistency by morning.

Calcium chloride – it’s a salt. Often found as a food additive and is sometimes used as the salt applied to winter roads. This can be bought at Home Depot or Home Hardware. Mix 1-2 Tbsp’s of calcium chloride into 3 litres of water (can be tap water) to create the other part of the mixture.

**Action**

1. If possible, have all mixing components laid out for the students before you start.
2. Ask the students if they recognize any of the materials in front of them. How could they figure out what they are? They can use their eyes and perhaps recognize what some of the substances are. They can smell them (teach them the proper scientific “wafting” technique). They must not taste them (although everything involved in this is totally safe and food grade) because an unknown substance could harm them.
3. Start investigating! Have the students try mixing the ingredients in front of them all at the same time.
4. Start with:
	1. Vinegar mixed with water
	2. Vinegar mixed with baking soda
	3. Water mixed with baking soda
	4. Vinegar mixed with corn starch
	5. Coloured vinegar mixed with baking soda
	6. Sodium alginate solution mixed with calcium chloride solution

**Conclusion/Wrap up**

Mixing the components in this order leaves the most exciting mixture to the end. When the sodium alginate is squirted into the calcium chloride it reacts and the sodium alginate strands turn into worm-like structures. This is a really fun moment with the students where you can build them up before they mix the final 2 ingredients together. Ask them questions like “what do you think is going to happen?” When the sodium alginate and calcium chloride first mix, it seems as if nothing has happened. Have the students put their fingers into their cups and they’ll immediately feel the solid worm-like strands. They will want to spend some time playing with them, so make sure you budget some time for that. It is best if the students use a syringe or a pipette to squirt the sodium alginate solution into the cup of calcium chloride. It will make better worm-like strands!