**STEM Challenge** 







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# How do we make toothpaste?

## > Sodium Fluoride

Fluoride is the main 'active ingredient' in toothpaste. When foods or drinks containing sugars enter the mouth, the bacteria within the plaque rapidly convert the sugars into acid. The acid can soften the enamel and cause cavities or holes. Fluoride can help prevent this by strengthening the enamel.

### > Abrasives

Common abrasives are silica, calcium carbonate and aluminium oxide. These are the ingredients which remove food debris and stains from the teeth. They scrub the surface of the teeth without scratching or damaging the enamel.

#### Humectants

Common humectants include sorbitol and gylcerol. Humectants prevent water loss from toothpaste so it does not go hard when the cap is left off the tube. They also trap water in the paste so that when you squeeze the tube, you get a nice smooth paste.

#### > Flavours

These give the toothpaste a nice taste and can leave your breath and mouth feeling fresh! Natural mint oils can also provide some natural anti-bacterial properties. Flavours also include artificial sweeteners which improve the taste of the paste and mask any other bitter materials in the toothpaste.

#### > Detergents

These materials provide foaming when you brush. The foam helps move the materials in the paste around the mouth aiding cleaning and delivery of actives such as fluoride. They are also used to disperse natural flavour oils in the water based paste.



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