

Milk to Glue

On SCOPE's How more things are made episode, Julia mixed up some homemade glue, using... milk!

Here's how you can do it at home:



What you need:

- 2 small bowls
- Hot water
- Measuring cups
- Measuring spoons
- Powdered milk
- Mixing spoon
- Vinegar
- Coffee filter paper
- Small cup
- Baking soda
- Paint brush to spread the glue

What to do:

1. Pour $\frac{1}{4}$ cup of hot water into a small bowl.
2. Add 2 tablespoons of the powdered milk.
3. Stir the mixture until the powder has dissolved.
4. Add 1 tablespoon of vinegar.

The vinegar curdles the milk so it separates into solid bits called curds and a liquid called whey.

Next we need to separate the curds and whey.

5. Place the coffee filter paper into a small cup.
6. Pour the mixture into the filter paper.

The liquid (whey) should drain through the bottom of the filter paper.

7. Try squeezing the filter paper to remove as much whey as possible (but be careful that the filter paper doesn't rip).
8. Transfer the curds into another small bowl.
9. Break up the curds with the spoon.
10. Add one tablespoon of hot water.
11. Add $\frac{1}{2}$ tablespoon of baking soda.
12. Stir the mixture.

You have now finished making the glue!



What's happening?

When you add the vinegar (which is an acid) to the milk, it causes the milk to separate into curds (solid bits) and whey (liquid). This is because the acid causes the milk protein to unravel and become twisted, and therefore lumpy. The protein is called casein and is not only used to make home-made glue, but also cheeses, paints, jewellery and even plastic.

The baking soda is added to the curbs because it is a base, so it neutralises the acid in the mixture (vinegar) and helps the glue to return to a more liquid form.

We all know that milk can go off pretty quickly, so make sure you use all the glue within a few days!