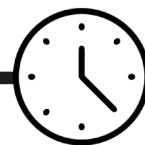


## 4. The challenge!



60  
mins

Using cellulose paste, children make pastes of different viscosities which retain the property of sticking paper, but which do not run off the paper.

### OBJECTIVES

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- To use the knowledge gained to solve a problem about runniness of paper paste
- Using straightforward scientific evidence to answer questions or to support their findings

### RESOURCES

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(Per group of 4 children unless otherwise stated)

- Activity sheet 7
- 25 ml of the very thick cellulose paste (7 g/500 ml water recipe)
- Stirrers or spoons
- Pipette
- Measuring cylinder (100 ml or 250 ml)
- Marble
- 100 ml water
- Stop clock

### INTRODUCING THE ACTIVITY (5 MINUTES)

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Challenge the children to produce a paper paste which retains its sticking properties without being so watery and runny that it will not dry in a reasonable time. The reason for using a diluted form of the paste has to do with the cost of the powder. Diluting the paste will make it go further. Referring to the letter, ask the children what they think they will need to be able to tell the company about their experiments? They should establish that they need to know how much thick paste they have started with, and how much water they add to make it the 'correct' runniness. When they have completed the challenge, they could also use their runniness measurements to find out where their sample fits on the 'runny scale'.

### MAIN ACTIVITY (50 MINUTES)

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Each group of children is given a sample of the prepared very thick paste and must dilute it to the consistency they think is ideal. Using a pipette, they add a pipetteful from the pot of water and stir it into the paste. A small sample of this is used to stick a square of paper onto a large sheet. The time taken for it to dry can be measured using the stop clock. They can continue diluting and sticking in this way until they think the sample is 'too thin'. Below each square they write the number of pipettes of water added. In this way, they can identify the paste that provides the optimum or best recipe for the company.

Finally, the teacher can scale their recipe up to 250 ml paste, and put it into a measuring cylinder so that they can use the 'marble test' to find where their paste fits on the runny scale.

### **PLENARY (5 MINUTES)**

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The plenary draws together their findings from the investigation. Discussion questions can include:

- Is there a point when the paste becomes unusable?
- Why is it unusable? Is it too thin and runny, or does it take too long to dry?
- What information can they give the company about saving money by diluting the mixture?