Waterproof Materials: Adult Guide

Support fair comparisons, separate observations and conclusions based on evidence.

Prepare and supervise

Stay beside the child. Prepare 8 cm square samples of plain paper, cotton cloth, kitchen foil and plastic sheet. Smooth sharp foil edges. Use dry, undamaged samples in one layer and four clear plastic cups with the same 5 cm opening. Put a fresh dry tissue square in each cup; tape each sample around the rim without covering the centre. Work on a tray and wipe spills promptly.

Keep the comparison consistent

Use the same dropper, 5 drops, a 2 cm drop height and a 30-second wait for every sample. Keep each cup still and put drops in the centre. Check the tissue through the clear cup before lifting the sample, so a spill from its surface cannot create a false wet result. If a drop runs over an edge or a sample tears, note that and repeat with a fresh dry sample and tissue.

Discuss the actual observations

There is no fixed result list for the four materials. Coatings, fabric weave, damage and sample thickness can change the outcome. Absorbing means taking water into the sample; waterproof means not letting water pass through. These are different properties. A wet surface alone does not show absorption. Use U when a change is unclear; discuss what the child saw instead of forcing Y or N.

Use evidence without overclaiming

A wet tissue suggests that water reached the inside, provided the rim did not leak. A dry tissue supports only “no water reached the tissue in 30 seconds in our test”. It is not proof that all samples of that material are waterproof. Accept predictions made before the test even when they differ from the observations. Check that the conclusion matches the recorded result. Repeat with fresh dry samples if useful.

Background: The STEM Hub, Canterbury Christ Church University; DfE science programme, KS1.