**Primary Schools:
Discovering Scientific Techniques - Fair Testing**

**Approximate timing:** 60 minutes

**Required resources:** PowerPoint presentation, 3 brands of paper towel, measuring cylinders & beakers, water, stopwatch/timer

**Summary:** How can we ensure that an experiment is well designed? This lesson will introduce students to the principles of fair testing and how to be sure their results are based on fact and includes an experiment to investigate the best brand of paper towel.

**The lesson supports:**

*Primary Curriculum – working scientifically*

Pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Setting up simple practical enquiries, comparative and fair tests

Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

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| **Learning outcomes** |
| All students will: | Be able to explain what makes an experiment fair |
| Most students will: | Provide results on which paper towel is best following a fair test |
| Some students will: | Explain the different types of variables that are required to make a test fair |
| Key word/s | Test, fairness, experiment, practical |

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| **Starter or ice-breaker activity** (5 mins)Identify students’ existing knowledgeTeacher monitoring starter, then goes over students’ answers* Use first slide to facilitate thinking around what makes a test fair or unfair.
 | Slide(s) 1-3Student actionsAnswer questions in groups or as a whole about what things to consider about a fair experiment to gauge background knowledge and interest:Can split into table discussions where students are shy to answer in front of whole class. |
| **Development** (15 mins) Teacher notesGo over slide content – refer to slide notes Presentation designed in question / answer format: ask questions before showing the answer to help with engagement. | Slide(s) 4-12Student actions - answer questions and develop understanding of how scientists carry out fair tests. |
| **Principal Activity** (30-40 mins)Teacher notes:Ask the students for a prediction and reasoning before they start the testLet the children choose a method for doing the test, **as long as it is fair** (i.e. They have taken into account the different variables – ask them as a group about the different variables and how they’re ensuring their test is fair.)Example tests:* Dip towel into known amount of water, wait for a time, and see how much the towel has absorbed
* Put a small amount of water on a towel and see how much surface area of the towel gets wet (more absorbent = smaller wet area)
 | Slide(s) 16-17Student actions:* Work in groups (depending on amount of equipment available but groups of 3-6 would be ideal)
* Collect the right equipment – what will they need, what will they be measuring

Carry out experiment and record resultsCompare results from all groups - do they match up and was the prediction complete? |
| **Plenary** (5 mins)Plenary questions are linked to initial learning outcomes | Students answer question(s) on summary slide 18 to assess learning. |
| **Extension Activities** | Students could try running taste tests at home to compare brand-names to supermarket own-brands. |