Properties of materials - **Music Festival Materials** [6 sessions] By the end of this block you will have achieved the following **National Curriculum Science outcomes**	**Content** i. compare and group together everyday materials on the basis of their properties, including their hardness, transparency, and conductivity (electrical and thermal) ii. give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic **Working scientifically** i. planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary ii. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate iii. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs iv. using test results to make predictions to set up further comparative and fair tests v. reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations vi. identifying scientific evidence that has been used to support or refute ideas or arguments
Other curriculum areas covered	**D&T** • Use research and develop design criteria to inform the design of functional products that are fit for purpose, aimed at particular individuals or groups • Select from and use a wider range of materials and components, according to their functional properties and aesthetic qualities

Session 1 **Food prep materials challenge** *All food prep areas need to meet health and safety standards as well as be made from the best (and hardest) materials around. Your job is to investigate and make recommendations for the right material options.*	Children will • List properties suited to food prep surfaces • Plan and carry out an investigation on a range of materials for their hardness • Record findings in table and scatter graph form • Select the hardest materials from a range of materials that are also smooth and easy to clean
Session 2 **Keeping it hot… keeping it cold** *Ice creams need to stay cold, and hot chocolates and coffees need to stay hot. Can you investigate the insulating properties of a range of materials and make recommendations to food stall holders?*	Children will • Be able to define thermal conductor and thermal insulator • Plan and set up an investigation to determine which materials make the best thermal insulators • Record findings in table and line graph form • Recommend materials to store hot drinks and ice cream in based on investigation finding
Session 3 **Food packaging challenge** *Paper bags and bottles seem to be the way to go when it comes to take-out refreshments. But which is the best paper to use? And should stall holders go with glass or plastic for their drinks bottles? It is your job to find the answers.*	Children will • Plan and set up an investigate into the strength of various papers • Select the best paper from a range of papers to make a take-out food bag • Research glass and plastic as bottle materials and identify their key properties • Recommend a material for drinks bottles, based on a range of environmental and property based criteria

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Resources

Session 1
Provided:
Wrong materials resource, food prep area health & safety guidelines, sticky-note investigations guidance & example.
You will need:
Range of materials (plastics (plastic bags, polystyrene, bottles, melamine plates); metals (aluminium foil, stainless steel cutlery, iron hammers/saws); woods (if possible a hard wearing maple or walnut chopping board, and a less robust pine or oak chopping board); stone (chalk, granite); fabric (woven material, knitted wool, cotton); glass; rubber; cork; vinyl), nails for scratching, video recording devices.

Session 2
Provided: Investigation guidance.
You will need: Metal cup/coffee, range of containers (plastic (melamine) cups, glass jars, tin cans (paper removed), paper cups), hot & cold water and Pyrex jugs, thermometers, video recording devices.

Session 3
Provided: Sample questions for encouraging strength testing, guidance for investigation.
You will need: 'Lunch food' (include something greasy), equipment (see list), video recording devices.

Session 4
Provided: Cleaning rep marketing words, sticky-note investigation materials, images of gloves.
You will need: A range of cleaning cloths (made from different materials, including kitchen towel), measuring jugs, electronic scales, marbles, water.

Session 5
Provided: Sticky-note investigation resources.
You will need: Items for initial set up (including: salty water, pencil, spoon, metallic looking plastic), materials to test out for conducting electricity (including nails, paper clips, coins, scissors, spoons, aluminium foil, glass, fabric, iron wool, pens with metal bits on them, metallic card).

Session 6
Provided: Sticky-note investigation resources, I can questions.
You will need: Ear defenders, sound meter or app, materials for testing (including: thick card, rubber, bubble wrap, tin foil, cotton wool).