

# GGA Knowledge Organiser Year 4 STEM Investigation- Summer Term – Boomerangs & Roomerangs

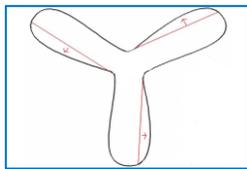
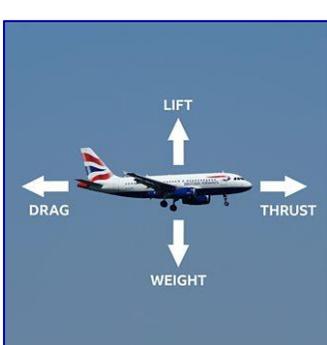
## Making-Learning using Tools and Equipment

<b>Template</b>	A pattern/shaped outline. There will be <u>two</u> templates on printed card which <b>MUST</b> be cut out very carefully to ensure a successful flight
<b>Reinforce</b>	To <b>strengthen and add support</b> . Instead of a single piece of card we are using two pieces. One single template from a thick piece would've been harder to cut out, this would perhaps affect the quality of the shape's finish
<b>Folding in aerofoils</b>	To <b>make a definition with a straight line or edge</b> . We are going to create aerofoils (see glossary) by folding certain parts of the roomerang which will enhance the flight performance.
<b>Surface decoration</b>	Using the guidance provided we will create a surface of decoration based on Aboriginal art.
<b>Precise &amp; Methodical</b>	To be as neat and accurate as possible, not to rush the construction and run the risk of it failing in flight.

### Forces of Flight

Aeroplanes rely on four different scientific forces to fly i.e. thrust, drag, weight and lift (see below) all of which act against each other. When they are all balanced, a plane will fly in a nice, straight line.

All four forces have to be present for a plane to get into the air, but lift is what keeps it there.



## Research, Designing & Planning

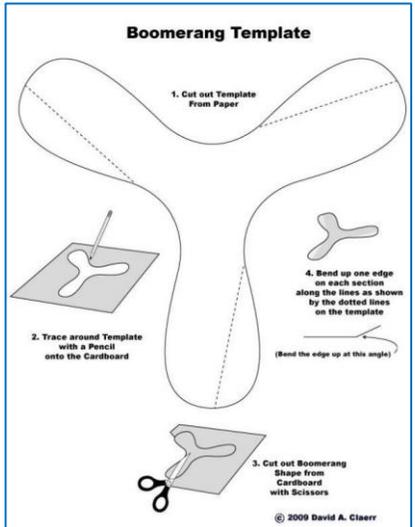
<b>Kolb's Learning Cycle (below left)</b>	Use this cycle to help you to continuously improve your design ideas and refine them until you have a successful outcome within the time constraints of the project.
<b>Using your DT booklet, plan and prepare using the step by step pages of guidance number below.</b>	
<b>1. Design Specification</b>	Go through the specification carefully with your teacher to ensure you understand the task. Understand who or what you are designing for depending on your project.
<b>2. Planning</b>	The careful selection of tools, equipment and resources in order to make your 3D design accurately and with a good quality finish. Consideration is given to why they have been selected.
<b>3. Design Development</b>	To develop and refine the design on paper to ensure that any potential problems are identified before making (and possibly wasting materials)
<b>4. Making and adapting</b>	Making the design as per the instructions given, always adapting and adjusting the 3D model to get the most accurate and precise finish possible.
<b>6. Evaluating</b>	To understand your experience and learn from it e.g. new skills acquired, new knowledge gained

### Why are we learning this?

**To know how:** to have a basic understanding of the aboriginal boomerang and how it was used.

### Why is it important?

**So that we understand how to:** make our own indoor version of the boomerang and experience its use first hand



## Cross Curricular Opportunities

<b>History</b>	To understand the origins of the aboriginal boomerang and its uses in hunting
<b>Science</b>	Performing simple investigations to test out simple theories of flight, velocity and aerodynamics.
<b>English</b>	Evaluating your product in your DT booklet
<b>PSHE &amp; Values</b>	Perseverance, Understanding and Patience
<b>Art</b>	To investigate Aboriginal art and translate their ideas and designs to the surface of our roomerangs

## Key Technical Vocabulary-Glossary

<b>Boomerang</b>	A curved flat piece of wood that can be thrown so that it will return to the thrower, traditionally used by Australian Aboriginal people as a hunting weapon.
<b>Roomerang</b>	A play on words describing an indoor boomerang, usually made from card or lightweight plastic to make it safer for indoor flight
<b>Aerofoil</b>	An aerofoil is the shape of a wing or blade as seen in cross-section. It is used to provide lift. Consider the different folds used for paper planes (below)
<b>Cross-Section</b>	A cutting made across something to reveal a view showing what the inside of something looks like after the cut has been made through it.
<b>Point of Origin</b>	Back to where something started from/began. The boomerang/roomerang when thrown should return to its point of origin i.e back to you, the thrower
<b>Accelerate</b>	To make something go faster
<b>Velocity</b>	How fast something is moving
<b>Aerodynamic</b>	How air affects a solid object as it moves
<b>Trajectory</b>	The flight path/route taken by a flying object

