Y1

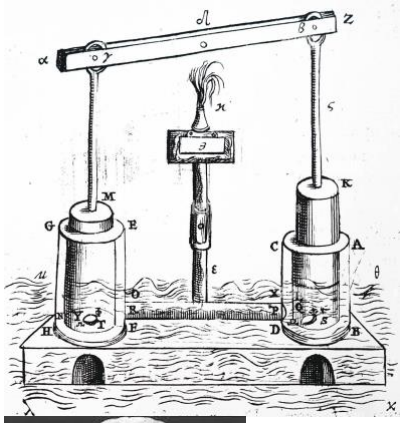
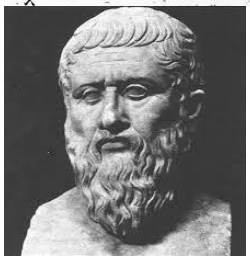
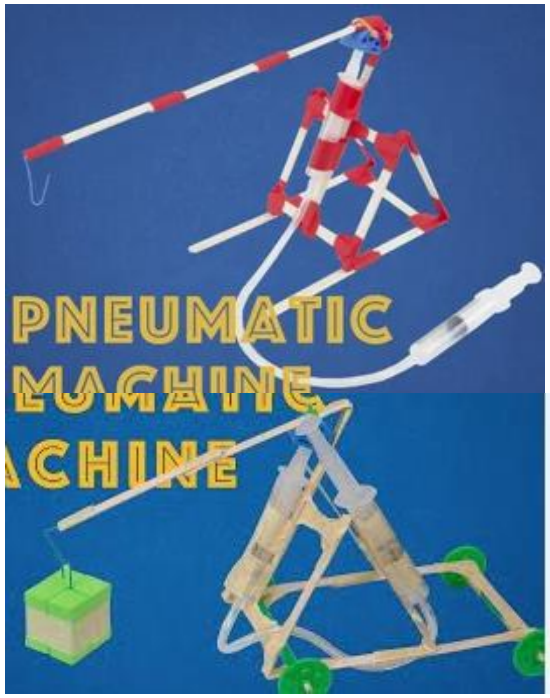
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|---|---|---|
| **Inspired by… (Designer)**<br>William George Horner (1786 - 1837)<br> | **Problem**<br>Design a picture book with moving parts.<br>**Something**<br>Moving Picture Book<br>**Somebody**<br>Young children<br>**Some Purpose**<br>How can we make story books more engaging for younger children? | **Outcome**<br>Moving Picture Books (joints & levers)<br><br> |
| **Design**<br>• Can select appropriate materials in relation to their properties<br>• Can draw and label what their intended product will look like<br>• Can design a product according to a given simple three or four point design criteria | **Make**<br>To build a prototype lever and slider from reusable resources<br>To use a prototype to make choices about an end product<br>To make purposeful choices about which materials to use<br>To know how to join materials together securely by gluing and taping<br>To know what makes a structure stable, for example, secure joining by overlapping.<br>To know some repairing techniques, for example, carefully taking apart and securing again | **Evaluate**<br>Through discussion and peer assessment:<br>• Can say what went well and what could be improved<br>• Can reflect on the suitability of the product for the intended consumer<br>• Can make improvements based on a prototype |

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| | To know some cutting and shaping techniques, for example, using scissors accurately<br>To create a moving part using levers and sliders<br>To use knowledge of the transference of forces to create a moving part, for example, levers<br>To know how to strengthen my structure<br>To repeat methods that work well<br>To be able to refine a structure to enhance its performance, for example, ensuring glued parts are secure | |

Y2

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| **Inspired by… (Designer)**<br>Bertha Benz (1849-1944)<br>Rear wheel drive car<br><br> | **Problem**<br>Electricity and fossil fuels are unavailable so an alternative fuel/force is needed to move a car safely.<br>**Something**<br>Potential force, rear wheel drive car.<br>**Somebody**<br>Everyday car users.<br>**Some Purpose**<br>Using potential energy, have a car move safely using a rear wheel drive. | **Outcome**<br><br> |
| **Design**<br>• Can select appropriate materials in relation to their properties<br>• Can draw and label what their intended product will look like<br>• Can design a product according | **Make**<br>To build a prototype from reusable resources<br>To use a prototype to make choices about an end product<br>To make purposeful choices about which | **Evaluate**<br>Through discussion and peer assessment:<br>• Can say what went well and what could be improved<br>• Can reflect on the suitability of the product for the intended |

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| to a given simple three or four point design criteria | materials to use<br>To know how to join materials together securely by gluing and taping<br>To know what makes a structure stable, for example, secure joining using overlapping<br>To know some repairing techniques, for example, carefully taking apart and securing again<br>To know some cutting and shaping techniques, for example, using scissors accurately and sawing<br>To create a moving part using axles and wheels<br>To use knowledge of the transference of forces to create a moving part, for example, a winding mechanism<br>To know how to strengthen my structure<br>To repeat methods that work well<br>To be able to refine a structure to enhance its performance, for example, ensuring that the axles can move freely and improving the alignment between each axle.<br><br>**https://www.youtube.com/watch?v=L75jZNKQNEA&t=60s**<br>**https://www.youtube.com/watch?v=0W9iaB42QDU**<br>**https://www.youtube.com/watch?v=lTNIAIcUtIc** | consumer<br>• Can make improvements based on a prototype |

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| **Inspired by… (Designer)**<br>Ctestibius of Alexandria (285BC - 222BC)<br><br> | **Problem**<br>Heavy building resources are needing to be effectively moved on a building site.<br>**Something**<br>Pneumatic crane<br>**Somebody**<br>Young children<br>**Some Purpose**<br>Using pneumatics, how can we lift an object from a surface? | **Outcome**<br> |
| **Design**<br>• Can select appropriate materials in relation to their properties<br>• Can draw and label (with added explanation and detail) what their intended product will look like, now including measurements and alternate views<br>• Can design a product according to a class created three or four point design criteria | **Make**<br>To build a prototype from reusable resources, for example, tape and lolly sticks<br>To use a prototype to make choices about an end product<br>To make purposeful choices about which materials to use<br>To know how to join materials together securely by taping | **Evaluate:**<br>Through discussion, peer assessment and in writing:<br>• Can explain what went well and what could be improved<br>• Can reflect on the suitability of the product for the intended consumer<br>• Improve designs and products giving reasons for choices |

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| | To know what makes a structure stable, for example, secure joining and using triangular shapes<br>To know some repairing techniques, for example, carefully taking apart and securing again<br>To create a moving part using hydraulics<br>To use knowledge of the transference of forces to create a moving part, for example, water pressure (hydraulics)<br>To know how to strengthen my structure<br>To repeat methods that work well<br>To be able to refine a structure to enhance its performance, for example, assessing the strength of the structure and reinforcing joins where necessary.<br><br>**https://www.youtube.com/watch?v=y3jDcj6wkFM**<br>**https://www.youtube.com/watch?v=BFw899OaD0s** | |

<table>
<tr>
<td>Inspired by… (Designer)<br>Adrian Newey (1958 - )<br></td>
<td>Problem<br>Design a car to win a Formula E race.<br>Somebody<br>For Red Bull Racing<br>Something<br>Electronic Lego car<br>Some Purpose<br>Using gears and pulleys, how can we use Lego to create a functioning toy car?<br>Can this car be fully programmed to advance its performance to win a race?</td>
<td>Outcome<br><br></td>
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<tr>
<td>Design<br>• Can select appropriate materials in relation to their properties<br>• Can draw and label (with added explanation and detail) what their intended product will look like, now including measurements and alternate views<br>• Can design a product according to a class created three or four point design criteria</td>
<td>Make<br>• To build a prototype from reusable resources: Lego<br>• To use a prototype to make choices about an end product<br>• To make purposeful choices about which materials to use, in this example, which shapes and blocks for which purposes<br>• To know how to join materials together securely by overlapping blocks</td>
<td>Evaluate:<br>Through discussion, peer assessment and in writing:<br>• Can explain what went well and what could be improved<br>• Can reflect on the suitability of the product for the intended consumer<br>• Improve designs and products giving reasons for choices</td>
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| | • To know what makes a structure stable, for example, overlapping blocks<br>• To know some repairing techniques, for example, carefully taking apart and securing again<br>• To create a moving part using axles, wheels and a motor<br>• To use knowledge of the transference of forces to create a moving part: rotation<br>• To know how to strengthen my structure<br>• To repeat methods that work well<br>• To be able to refine a structure to enhance its performance, for example, using the principles of streamlining | |

Y5

**Inspired by… (Designer)**
Sir Horace Jones (1819 - 1887)





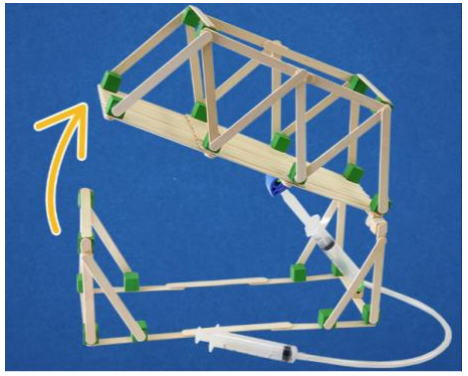
**Problem**
Cars and pedestrians need to cross the River Thames and boats need to travel along it.

**Something**
Lifting Pneumatic bridge

**Somebody**
The people of London

**Some Purpose**
Using pneumatics, design a bridge to allow boats through

**Outcome**



**Design**

**Design**

- Can select appropriate materials in relation to their properties
- Can draw and label (with added explanation and reasoning) what their intended product will look like, now including measurements, alternate views and cross sectional and exploded diagrams
- Can design a product according to an independently created design criteria

**Make**

- To build a prototype from reusable resources
- To use a prototype to make choices about an end product
- To make purposeful choices about which materials to use
- To know how to join materials together securely by overlapping sections
- To know what makes a structure stable, for example, secure joining and using triangular shapes
- To know some repairing techniques, for example, carefully taking apart and securing again

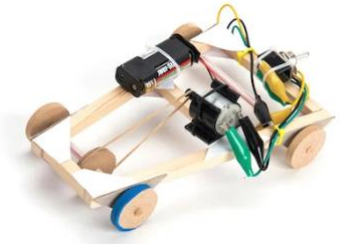
**Evaluate:**

Through discussion, peer assessment and in writing:

- Can explain what went well and what could be improved
- Can reflect on the suitability of the product for the intended consumer
- Improve designs and products giving reasons for choices
- Evaluate the design of projects and suggest improvements to the user experience

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| | • To create a moving part using pnuematics<br>• To use knowledge of the transference of forces to create a moving part, for example, air pressure (pneumatics)<br>• To know how to strengthen my structure<br>• To repeat methods that work well<br>• To be able to refine a structure to enhance its performance, for example, reflecting on the force created by the pneumatics and enhancing its performance through rebuilding.<br><br>**https://www.youtube.com/watch?v=aeReQAxKwZo&t=134s** | |

Y6

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<td>Inspired by… (Designer)<br>Elon Musk<br></td>
<td>Problem<br>In order to reduce carbon emissions, cars and other vehicles that use fossil fuels are having to turn to electricity as a source of fuel.<br>Something<br>Electric using series circuits<br>Somebody<br>Environment caring car drivers<br>Some Purpose<br>Using electricity through series circuits, create an electric car.</td>
<td>Outcome<br><br></td>
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<tr>
<td>Design<br>• Can select appropriate materials in relation to their properties<br>• Can draw and label (with added explanation and reasoning) what their intended product will look like, now including measurements, alternate views and cross sectional and exploded diagrams<br>• Can design a product according to an independently created design criteria</td>
<td>Make<br>• To build a prototype from reusable resources<br>• To use a prototype to make choices about an end product<br>• To make purposeful choices about which materials to use<br>• To know how to join materials together securely<br>• To know what makes a structure stable, secure joining<br>• To know some repairing techniques, for example, carefully taking apart and securing again<br>• To create a moving part using an electrical circuit and motor</td>
<td>Evaluate:<br>Through discussion, peer assessment and in writing:<br>• Can explain what went well and what could be improved<br>• Can reflect on the suitability of the product for the intended consumer<br>• Improve designs and products giving reasons for choices<br>• Evaluate the design of projects and suggest improvements to the user experience</td>
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| | • To use knowledge of the transference of forces to create a moving part, for example, rotation<br>• To know how to strengthen my structure<br>• To repeat methods that work well<br>• To be able to refine a structure to enhance its performance, for example, ensuring that the axles can move freely and improving the alignment between each axle | |