

STEM Program Years 1- 10 Year 7 Overview

Physical Sciences, Science Inquiry Skills, Science as a Human endeavour

Outcome	Concepts	Activity	Worksheets	Resources Required
<p>SU Year 7 Change to an object's motion is caused by unbalanced forces acting on the object</p> <p>Earth's gravity pulls objects towards the centre of the Earth</p> <p>SIS Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task . Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships, including using digital technologies as appropriate Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method</p>	<p>Balanced forces cancel out keeping a body stationary or moving at a constant speed. Force diagrams represent all the forces acting showing size and direction.</p> <p>Inertia is the tendency of a body to keep its previous state, moving or stationary.</p> <p>Unbalanced forces cause acceleration or deceleration.</p> <p>Frictional forces are dependant on weight, area and nature of the surface.</p> <p>The weight of an object is due to its mass and the size of the gravity force. In any one place weight and mass are in direct proportion shown by a straight line graph.</p> <p>Newtons Laws explain forces causing motion. Acceleration of an object depends on the force and the size of its mass.</p>	<p>Notes on Balanced and unbalanced forces, friction and weight.</p> <p>Investigate surfaces and weights effects on static friction.</p> <p>Investigate mass versus weight.</p> <p>Notes on Acceleration and Rockets</p> <p>Investigate force, mass and acceleration using elastic cars.</p>	<p>7.1 Lesson Balanced vs Unbalanced forces 7.2 Nuclear Reactor Game.</p> <p>7.3 Investigating Friction and load</p> <p>7.4 Investigating Weight versus mass.</p> <p>7.5 Lesson Force and Acceleration</p> <p>7.6 Investigating Elastic Dragcars</p>	<p>Rubber bands Force balance</p> <p>String Rope Chairs Cans Box Large elastic band</p> <p>50/100g weights sled or box rubber bands or spring balance Option:Force sensor and datalogger</p> <p>Stand and clamps 50/100g weights 5N spring balance Option:Force sensor and datalogger</p> <p>Skateboard, 4 wheel trolley or chair on castors, rope</p> <p>Model elastic Car kit or LEGO etc. Various size elastic bands. Weights or plasticene</p>

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<p>Use scientific knowledge and findings from investigations to evaluate claims Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate SHE Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people's understanding of the world Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations Science understanding influences the development of practices in areas of human activity such as industry.</p>	<p>Forces come in pairs called action and reaction. We move by action and reaction forces. Rockets move by exhausting a gas or liquid and reaction forces.</p> <p>Optional Robotics Projects Design a smart robot system.</p>	<p>Investigate Balloon rockets.</p> <p>Project Design a rocket that can carry a load from one place to another.</p> <p>Project Design a robot that uses its sensors to respond to various changes.</p>	<p>7.7 Investigating Balloon Rockets</p> <p>7.8P Project : Design a rocket to Transport a Load</p> <p>7.9P Design a Smart Bot</p>	<p>Various shape balloons Straw, string, tape Stopwatch.</p> <p>Equipment for rockets (bottles, balloons, cars and boats, string tape etc.)</p> <p>LEGO NXT or EV3 kits</p>