



Medium Term Plan – Key Stage -3 - Books and Authors: The War of the Worlds/ Forces and Motion

Science	Week 1	Week 2	Week 3	Week 4
	<u>Where did the aliens come from?</u>	<u>What is it like on Mars/ other planets?</u>	<u>How did the aliens get to Earth?</u>	<u>What is the best shape for a rocket?</u>
	<p>Objective: To name and describe the planets of the solar system.</p> <p>Success Criteria:</p> <p>Support: I can point to Earth, Sun and Moon on a diagram. (S8)</p> <p>Core: I can use simple secondary sources to find answers. (S12 Working Scientifically)</p> <p>Extension: I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. (S16)</p> <p>LOtC: 1000 yard model of the solar system</p> <p>Using IT: Research task – using effective searches to research planets of the solar system.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Read through relevant parts of the Book the War of the World, HG Wells. – where did the aliens come from? Look at models, images of the solar system. Make a model for the solar system; play doh, 1000 yard model with relative sizes, use sweets, balloons. Explain that planets look like stars in the sky. Use facts or clues to sequence the planets Write a mnemonic to remember the order of the planets Independent research task on a planet. Draw/craft what the aliens look like. Sequence/ order planets by size/ sorting planets by colours/ big/small. Look at a recent news article 'the tenth planet' – debate is Pluto really a planet? What is the difference between a planet and a star and a moon? Look at different theories for the solar system (geocentric/heliocentric) 	<p>Objective: To compare the gravity of the planets of the Solar System.</p> <p>Success Criteria:</p> <p>Support: I can say that pushes and pulls can move things. (S9)</p> <p>Core: I can say that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (S11)</p> <p>Extension: I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (S15) I can explain: gravity force, i.e. weight = mass x gravitational field strength (g) – on Earth $g=10\text{ N/kg}$ (different on other planets and stars) (S19)</p> <p>LOtC: Rig the trim trail to represent the 'weight' on another planet</p> <p>Using IT: Use excel spreadsheet to draw a bar chart.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> What keeps the planets going around the sun, demo this using a ball on a string. Newton's 1st law of motion. What stops us floating into space? Swing on the nest swing, push it really hard – what is the force we can feel acting on us? Observe dropping different objects, make predictions- do all objects fall? Different sized planets and suns have different gravitational pulls, - the bigger then planet the bigger the gravitational pull. Pass round 3 tins; with masses inside- label Earth (100g), Jupiter (250g) and Mercury (40g), These tins represent what the same tin would feel like if on Earth/Jupiter/ Mercury. What it feel like to walk on Jupiter- act out? What would it feel like to walk on Mercury? Describe the difference between mass and weight- Work out your weight on the different planets – draw a bar chart. What stops us falling though the ground – reaction force, draw force diagram for different scenarios. 	<p>Objective: To describe the forces acting when a rocket takes off.</p> <p>Success Criteria:</p> <p>Support: I can say that pushes and pulls can move things. (S9)</p> <p>Core: I can describe forces as pushes or pulls, arising from the interaction between two objects. (S15)</p> <p>Extension: I can use force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. (S18)</p> <p>LOtC: Sensory room to simulate a rocket launch.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Watch clip of a rocket taking off, what forces are acting? Draw forces diagrams Describe balanced and unbalanced forces (Newton's 1st law of motion), and Force =mass x acceleration ($F=ma$, Newton's 2nd law). Sequence photos of rockets taking off. Use senses to observe what happens when a rocket takes off- what would it feel like? Set up the sensory room with loud sound effects, heaters, hair dryers, vibrating mats, video clips, to simulate a rocket launch- sit pupils in a chair upside laid on its back. 	<p>Objective: To investigate shapes that reduce drag.</p> <p>Success Criteria:</p> <p>Support: I can start to show awareness that air is a force that can move things. (S10)</p> <p>Core: I can describe the air significantly slows objects with large surfaces. I can say that friction is a force between two surfaces that can slow things down. (S12)</p> <p>Extension: I can identify the effects of air resistance, water resistance and friction that act between moving surfaces (S16)</p> <p>LOtC: Paper air plane competition.</p> <p>Using IT: Use a spreadsheet to record records, using a stopwatch to collect data.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Demonstrate- 1 piece of paper and 1 ball of paper- which one will hit the floor first? Why? Compare two boxes/containers the same shape and size -one empty, one with masses inside? Which one will hit the ground first? Why? Observe what happens? Why? Watch video clip of an astronaut dropping a hammer and feather on the Moon, observe, explain. Use a long tube filled with clear baby oil, make different shapes using plasticine and drop them down tube, measure the time to hit the bottom, which one falls the fastest? Which shape has the least resistance/drag? Using information from the test, design a rocket that is the best shape to take off. Paper airplane competition- which shape has more/less drag? Draw force diagrams for scenarios involving drag Look at Newton's 1st Law of motion- balanced and unbalanced forces.
	Week 5	Week 6	Week 7	Week 8
	<u>Describe the aliens journey to Earth?</u>	<u>How did the aliens land on Earth?</u>	<u>How is the air different on Earth?</u>	<u>How could we fight the aliens?</u>
	<p>Objective: To describe a journey.</p> <p>Success Criteria:</p> <p>Support: I can investigate objects that move by different means – wind, water, wind up etc. (S10).</p> <p>Core: I can compare how things move on different surfaces. (S13)</p> <p>Extension: I can represent a journey on a distance-time graph. (S18) I can use the light year as a unit of astronomical distance. (S19)</p> <p>LOtC: Give pupils a distance time graph and follow it to walk the journey represent</p> <p>SMSC</p> <p>Using IT: Use excel to plot a line graph to represent a journey. Use of Ipad/movie maker.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Read relevant passage from story 	<p>Objective: To describe the forces acting on falling objects.</p> <p>Success Criteria:</p> <p>Support: I can say that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (S11)</p> <p>Core: I can identify the effects of air resistance, water resistance and friction that act between moving surfaces. (S16)</p> <p>Extension: I can use force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces. (S17) I can understand change depends on direction of force and its size. (S18)</p> <p>LOtC: Testing egg landers</p> <p>Using IT: Use of stop watches or slow motion video</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Watch a video clip of a sky diver, what happens 	<p>Objective: To describe the composition of the Earth's atmosphere.</p> <p>Success Criteria:</p> <p>Support: I can describe the basic needs of animals for survival, e.g. air to breathe. (S11 Animals)</p> <p>Core: I can analyse data to look for naturally occurring patterns and relationships. (S14 Working scientifically)</p> <p>Extension: I can state the composition of the atmosphere. (S16 Materials)</p> <p>LOtC: SMSC</p> <p>Using IT: Use of Excel t make a pie chart</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Look at data for the composition of the Earth's atmosphere, compare this with data for Mars Explain what we need the gases for. Demonstrate – make and test for the gases, oxygen relights a glowing match, carbon dioxide 	<p>Objective: To apply the idea of forces to design a catapult.</p> <p>Success Criteria:</p> <p>Support: I can say that pushes and pulls can move things. (S9)</p> <p>Core: I can understand how levers work. (S13)</p> <p>Extension: I can explain that simple machines give bigger force at the expense of smaller movement (and vice versa). The product of force and displacement is unchanged. (S17)</p> <p>LOtC: Use a see saw to investigate turning moments.</p> <p>Using IT: Use of Excel spreadsheet to record data and plot graph</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Investigate Hooke's Law – what happens to a spring or rubber band when masses are added to the end? Plot a graph with results



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<ul style="list-style-type: none"> Describe a Journey Sequence a journey Look at distance time graphs and interpret them Plot a distance time graph for a journey of their own Write story to match a distance time graph Make a rocket and simulate the journey the aliens made. Define and describe a light year, compare the distance of the planets in light years. Use Ipad to record a journey and then make a description/ and graph to go along side it. Investigate the way objects move on different surfaces 	<p>when the chute opens (they do <u>not</u> go up!)</p> <ul style="list-style-type: none"> Describe the forces acting on the man as he falls, sequence and draw force diagrams. Discuss the idea of terminal velocity. Design and make an alien lander to land an alien safely. Make and test the landers. <p>Explain that pressure decreases with height as they weight of the air above decreases. As the sky diver falls the pressure on him/her increases.</p>	<p>puts a lit match out, hydrogen makes a squeaky pop. Water turns copper chloride paper from blue to pink.</p> <ul style="list-style-type: none"> Compare with helium balloons Experiment to determine the % of Oxygen in air (copper + oxygen → copper oxide) 	<ul style="list-style-type: none"> What happens to objects when forces are applied to them? – test how to crush cans by applying different forces Investigate levers and turning moments. Look at pressure –define pressure, calculate your own pressure Use ideas about springs, rubber bands and pressure, to design and make a catapult or weapons to fight the aliens.
<p>Week 9</p>	<p>Week 10</p>	<p>Week 11</p>	<p>Useful Links/ Suggested Home Learning</p>
<p>What killed the aliens? (pre KS4) Objective: To name and describe different types of microbe. Success Criteria: Support: Core: Extension: LOtC: Fungus Hunt SMSC Using IT: Suggested Activities:</p> <ul style="list-style-type: none"> Read the relevant section of the book. Look at images and biological drawings for viruses, bacteria and fungi Use agar plates to test different area of the classroom for bacteria or fungi. Make models of bacteria, virus or fungi Investigate the spread of germs- watch a video clip of a sneeze- see how far particles spread Hand- shaking experiment to investigate the spread of 'germs' Look at the various ways microbes can be spread. 	<p>Why don't microbes kill us? (Pre KS4) Objective: To describe the job of our immune system. Success Criteria: Support: Core: Extension: LOtC: SMSC Using IT: Suggested Activities:</p> <ul style="list-style-type: none"> Look at the various methods our body has to protect from disease. Look at the role of white blood cells Make a cartoon strip to show phagocytosis (white blood cells engulfing a pathogen) Make a big body outline and label with the protective mechanisms out bodies have e.g. skin, ear wax, eyelashes, stomach acid, eyebrows, tears 	<p>What could the aliens have done to survive? Objective: To describe how to protect ourselves from microbes. Success Criteria: Support: I can say what keeps them healthy. (S9 PSHE) Core: I can describe what hygiene is and ways in which we can maintain hygiene (S11 Animals) Extension: I can make informed choices to maintain their health and well-being, and can explain reasons for these choices (S14 PSHE). SMSC: Promoting keeping ourselves healthy Using IT: Research – using effective searches Suggested Activities:</p> <ul style="list-style-type: none"> Investigate hand washing, - which is more effective, soap, water? Look at the effect and role of vaccines on our body Look at ways for keeping ourselves clean and healthy including diet. Make an instruction manual on 'how to invade Earth'. Debate should we have vaccines? Research common side effect of vaccines Research /investigate ways people have survived diseases e.g. during the plague. 	<ul style="list-style-type: none"> Making a catapult http://kidsactivitiesblog.com/55055/15-easy-catapults-to-make Composition of Earth's atmosphere http://www.bbc.co.uk/schools/gcsebitesize/science/aqa_pre_2011/oils/changesrev5.shtml 1000 yard model of the solar system http://www.spy-hill.net/myers/peppercorn/ Sky diving clip https://www.youtube.com/watch?v=CPM9sxExqBw Data comparing the planets http://nssdc.gsfc.nasa.gov/planetary/factsheet/ https://www.cdc.gov/bam/teachers/documents/epi_4_hand_wash.pdf http://www.nuffieldfoundation.org/practical-biology/making-nutrient-agars Terminal velocity video clip https://www.youtube.com/watch?v=p0IZsfzDS4s http://practicalphysics.org/investigating-simple-steel-springs.html <p>Suggested Home Learning: Make a survey – do people really think aliens exist? Find a newspaper article about life on Mars- do you think we should search for life on other planets?</p>