Year 7 Science

2019 Summer Term

SCIENCE UNDERSTANDING

Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object (ACSSU117)

Elaborations

- investigating the effects of applying different forces to familiar objects
- investigating common situations where forces are balanced, such as stationary objects, and unbalanced, such as falling objects
- investigating a simple machine such as lever or pulley system
- exploring how gravity affects objects on the surface of Earth

WEEK	ASSESSMENT	WEIGHTING
4	Paper Rocket Investigation (format)	5%
5 & 8	Learning Checkpoints	4%
7	Friction Investigation	6%
10	Topic Test	10%

TEACHER INFORMATION

ItunesU course code = EWE-KFC-HEH

Education perfect links in iTunes U

STILE Resources

Week	Content	Success Criteria Students will be able to:	Activity Suggestions	Assessments/Notes
2 2 lessons	**Science is ... everywhere!** (From STILE Introduction to Science) **What is Science?** • What is science? • Who does science? • Where does science happen? • Why do science? Investigating Bubbles Lesson 1.1 What is science? Lesson 2.1 Lab safety	• describe the main branches of science and explore questions that might be asked in each one. • explore what one different scientists di in their jobs • reflect on their observations and generate new questions. • identify unsafe situations and safety hazards in the lab • write a set of safety rules and share these with the class to create a class set of safety rules. • create a poster,to help remember the class safety rules	From STILE: Intro to Science Lesson 1.1 What is Science? Lesson 2.1 Lab safety	Safety Rule Poster
3 3 lessons	**Forces and their effects** • What is a force? • Effects of forces • Measuring forces **Learning Scientific Method with paper Rockets**	• identify and describe the changes in motion caused by forces • describe the five key features of forces. • measure forces using a spring balance • design and conduct an experiment to test a hypothesis • draw conclusions from the results of the experiment • relate the experiment to their knowledge of forces	• Griffon Rollercoaster video • Interactive book (see iTunes U) • Ed Perfect: What are forces ? • INV: The effects of forces (itunesU) • Use of the spring balance https://www.sciencebuddies.org/teacher-resources/lesson-plans/scientific-method-rockets#lesson	Investigation assessed for correct format
4 4 lessons	**Forces and their effects cont.** • Contact & Non-contact forces • Balance and unbalanced forces	define contact forces, force and non-contact forces • provide examples of contact and non-contact forces • define balanced forces, net force and unbalanced forces	• Ed Perfect : Contact & non contact forces • interactive book (see iTunes U) • Ed perfect Balance & unbalanced forces	

Week	Content	Success Criteria :Students will be able to:	Activity Suggestions	Assessments/Notes
5 2 lessons	**Balancing Forces** • Evidence of balanced & unbalanced forces • force diagrams	Students will: • describe the effect of balanced and unbalanced forces • provide examples of situations involved balanced and unbalanced forces • identify the key characteristics of situations in which the forces are unbalanced • draw force diagrams • relate a change in motion of an object to unbalanced forces.	Photograph & Annotate an object around the school. Use arrows to show size and direction of forces.	Learning Checkpoint: Socrative Quiz
6 4 lessons	**Friction: friend or enemy?** • what is friction? • Evidence of friction • Reducing friction **Gravity** • What is gravity? • Difference between weight & mass	• define friction, lubrication and traction • describe friction as a 'slowing down' force • explain how to reduce or increase friction • relate air resistance and drag to friction • define gravitational field and gravitational force • describe gravity as a force that pulls an object toward the centre of the Earth • explain why rockets need such a massive force to escape from Earth.	• interactive book (see iTunes U) • Real world examples: Bike helmets , airbags and seatbelts <u>Free falling</u> Punch a small hole in the side of a foam cup, near the bottom. Cover the hole and fill with water. Students can predict what will happen to the water when the hole is uncovered. Repeat but drop the cup at the same time. Gravity acts on the cup and water when they are fall and so the water stays in the cup during the fall. Felix Baumgartner's jump Student investigate Felix Baumgartner's jump and discuss the effects of gravity and air resistance through the fall.	Assessment: investigation write-up of what if the amount of friction was changed? possible ideas STILE: Effects of forces

Week	Content	**Success Criteria:** Students will be able to:	Activity Suggestions	Assessments/Notes
7 **4 lessons**	**Magnetic Forces** • magnetic poles & their interaction with each other • real life application • magnetic material • magnetic fields	• define magnet, magnetic and poles • describe the interactions between like and unlike poles of a magnet • provide examples of the use of magnets in real life • classify magnetic force as a non-contact force • identify materials that are magnetic. • explain that the magnetic field is the area around the magnet where the magnetic force is experienced	Invest: Push and Pull with a magnet Uses of magnetism Students can investigate some of the uses of magnetism in everyday life. Extension: Credit cards and magnets	
8 **4 lessons**	**Electrostatic charges** • What causes a electrostatic force? • Van de Graaff generator • Electrostatic forces in everyday life **Buoyancy** • What is buoyancy? • Buoyancy in everyday life • Why do things float?	define electron and static electricity • describe the interactions between like and unlike charged objects • provide examples of static electricity in real life • explain how to charge an object • relate electrostatic forces and magnetic forces . • define buoyancy, density and surface tension • provide examples of buoyancy • explain why objects float in water or in the air.	What if a balloon were electrostatically charged? Students can investigate electrostatic forces with charged balloons. Van de Graaff generator There are numerous demonstrations that can be done with a Van de Graaff generation, some of which can be found at the AMA Sci website. Encourage students to explain what is happening in terms of unbalanced forces in each situation. Buoyancy playground Students can investigate buoyancy of different objects in different liquids and relate buoyancy to gravity, density and mass using the PHET interactive	

•

Week	Content	**Success Criteria:** Students will be able to:	Activity Suggestions	Assessments/Notes
9 **4 lessons**	**Machines make tasks easier** • levers: fulcrum, effort and load • types of levers • mechanical advantage (no calculations) • force magnifiers • distance magnifiers • inclined planes • pulley, • screw • wedge • wheels and axles	• define lever, inclined planes, pulley, screw, wedge and wheels and axles • explain how fulcrum, effort and load are related to levers • • describe how levers, inclined planes, pulleys, screws, wedges and wheels and axles help make tasks easier.	Interactive book (see iTunes U) Websites on simple machines Use pages to create a book on simple machines Rube Goldberg machines A Rube Goldberg machine is one that uses overly complicated machines to carry out a simple task.	
10 **3 lessons**	• **Revision** • **Test**			