# Integrated Unit – Life Skills – Year 12

***Sample for Implementation for Year 12 from Term 4, 2018***

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| **Unit title** | Our Restless Earth | | **Duration** | **10 weeks**  Investigating Science Life Skills: 30 hours  English Life Skills: 20 hours  Mathematics Life Skills: 10 hours |
| **Unit description** | This unit integrates outcomes and content from the **Investigating Science, English and Mathematics Stage 6 Life Skills** syllabuses.  The unit explores the cause and impacts of geological disasters such as volcanoes, earthquakes and tsunamis on people, communities and the environment. Students will have opportunities to engage with, and respond to, multimodal texts that explore a range of perspectives and consider how disasters have shaped people’s experiences. Furthermore, students have opportunities to create models, collect and organise data in order to investigate ways in which people can prepare for, and minimise the impact, that disasters may have. | | | |
| **Outcomes**  **Science**  A student:   * poses questions and hypotheses for scientific investigation SCLS6-1 * plans an investigation individually or collaboratively to obtain primary or secondary data and information SCLS6-2 * participates in investigations individually or collaboratively to collect primary or secondary data and information SCLS6-3 * collects and represents qualitative or quantitative data and information using media as appropriate SCLS6-4 * develops conclusions from primary or secondary data and information SCLS6-5 * explores models and descriptions of phenomena SCLS6-10   **English**  A student:   * communicates in a range of everyday contexts for familiar audiences and purposes ENLS6-1 * reads, views and responds to texts in familiar contexts ENLS6-2 * comprehends and responds to a range of texts in familiar and unfamiliar contexts ENLS6-3 * uses strategies to comprehend a range of texts composed for different purposes and contexts ENLS6-4 * accesses information to communicate for different purposes and in different contexts ENLS6-5 * composes texts for a variety of purposes and audiences in a range of modes ENLS6-6 * explores texts that express a range of ideas, values, points of view and attitudes ENLS6-11   *The Investigating Science, English and Mathematics Stage 6 Life Skills courses course have an indicative hour requirement of 120 hours per year. Outcomes from the Life Skills Stage 6 courses may be integrated into other teaching and learning programs, which may then contribute to the total indicative hours.*  **Mathematics**  A student:   * engages with mathematical symbols, diagrams, graphs and tables to represent information accurately MALS6-2 * explores contexts of everyday measurement MALS6-4 * explores plans, maps, networks and timetables MALS6-11 * engages with plans, maps, networks and timetables effectively in a range of everyday contexts and situations MALS6-12 * engages with mathematical skills and techniques, including technology, to investigate, explain and organise information MALS6-13 | | | | |
| **Text selections**  This unit provides opportunities for students to experience a range of print and multimodal texts. Teachers select texts or excerpts of texts, based on the strengths, interests and needs of individual students. | | **Working Scientifically skills**  In this unit, students will have opportunities to develop skills in planning and conducting investigations to test questions, and to collect, represent and draw conclusions from data and information gathered in relation to the causes of geological disasters and the impact these disasters can have on people and the environment. | | |
| **Assessment overview**  *When undertaking this unit, it is important to take into account the individual communication strategies used by students. Students’ responses may be communicated through gestures and/or facial expressions, use of visual aids or symbols such as a communication board, assistive or augmentative technology and varying degrees of verbal or written expression.*  Assessment strategies could include but are not limited to:   * participation in conducting investigations, for example exploring the composition and structure of the Earth * constructing models, for example showing the Earth’s layers * identifying the cause of a natural disaster, for example an earthquake is the result of tectonic plate movement * recording and interpreting data and information gathered through investigation * using a range of modes, media and technologies to organise and present ideas * creating visual, multimodal or digital texts, including statistical representations, to communicate ideas, data and information gathered through investigation * using maps to locate or gather information * designing community-based safety campaigns, for example what to do in an earthquake * planning relief aid for a natural disaster.   *There is no expectation for formal assessment experiences for Life Skills courses.* | | | | |

| **Content** | **Teaching, learning and assessment** | **Resources** |
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| **Investigating Science Life Skills**  ***Working Scientifically***  *Questioning and Predicting*  Students:   * ask questions about the world around them Personal and social capability icon   *Planning Investigations*  Students:   * recognise the need to plan an investigation to test questions or hypotheses Personal and social capability icon Work and enterprise icon * participate in making decisions about how to test questions or hypotheses   ***Scientific Models***  *Models to form Understanding*  Students:   * recognise that scientists, in order to simplify or help explain something in the world, develop models Work and enterprise icon * explore a specific scientific model Critical and creative thinking icon  Information and communication technology capability icon Literacy icon   **English Life Skills**  *ENLS6-1*  Students:   * engage in class discussions about a topic or text Work and enterprise icon * engage in sustained communication in everyday situations, for example ask questions and comment in a conversation Personal and social capability icon   *ENLS6-4*  Students:   * comprehend and respond to a variety of texts in a range of formats to obtain information Critical and creative thinking icon * identify main ideas and supporting evidence in texts * use print or online referencing tools to understand unfamiliar words, for example dictionary, thesaurus  Information and communication technology capability icon   **Mathematics Life Skills**  ***Plans, Maps and Networks***  *Maps*  Students:   * recognise and respond to the language of maps Literacy icon * recognise the purpose and functions of maps * recognise a variety of maps Aboriginal and Torres Strait Islander histories and cultures icon Asia and Australia’s engagement with Asia icon  Information and communication technology capability icon Intercultural understanding icon * identify typical features of a map Literacy icon * create simple maps Critical and creative thinking icon Personal and social capability icon | **What are geological disasters and how can people investigate them?**  Introduce the topic through a variety of stimulus materials such as pictures, phrases, poems, short excerpts or videos. Using dictionaries or online reference tools, students create a word bank of key terms to be used throughout the unit.  Students create a mind map of different disasters, such as volcanoes, storms, fire, flood, war and famine. Students sort their responses into manmade (technical) disasters and natural disasters. Discuss the types of natural disasters and using pictures, sort examples into categories. This could be done as a group activity using stimulus material to represent different disasters. For example:   |  |  |  |  | | --- | --- | --- | --- | | **Earth**  (geological) | **Water**  (hydrological) | **Weather**  (climatological) | **Nature**  (biological) | | earthquakes  landslides  tsunamis  volcanic activity | avalanche  floods  rogue waves | blizzards/wind  cyclones  drought  fog  lightning  rain/hail  storms | animal infestation  diseases  plant infestation |     Explain that this unit will be exploring disasters caused by the Earth’s structure (geological) and students will be conducting investigations, collecting and analysing data and engaging with texts to explore how geological disasters occur and the impact they have on people and communities.  Review methods for conducting scientific investigations safely and fairly and have students contribute to planning methods by considering:   * What questions am I trying to answer? * How will I make sure my investigation is valid? * How can I measure and record any observations I make? * What will I do with my observations when I’m finished? * How will I present my findings to others?   Students view STEM UK online clip *The Splitting Earth.* Questions for discussion include:   * If we looked inside the Earth what would we see? * How hot is the inner core? Can people touch it? * What would happen if the core came to the surface of the Earth? * Is the crust of the Earth one solid piece? * What happens when the crust or plates on the Earth’s surface move?   Review of the composition and structure of the Earth. The Earth comprises four layers: inner core, outer core, mantle and crust. The inner core is the hottest part, the outer core is made up of liquid, the mantle is the widest section and the crust is a thin layer made of solid rock. Students consolidate their knowledge on the structure of the Earth by designing and creating a model to represent the Earth’s layers. Draw and label a cross-section of the model, considering how the model helps to explain the concepts of the Earth’s layers. Introduce students to the concept of scale when exploring models.  Explore the importance of mapping when investigating natural disasters. Introduce language associated with maps, eg scale, direction, coordinates. Compare historical and printed maps with digital, modern maps. What similarities and differences can be observed?  Identify the key features of a map including the key, scale and compass.  Students create a map of their school or local area using a key and if possible, a scale. | The Splitting Earth - STEM Learning UK  <https://www.stem.org.uk/elibrary/resource/28505> |
| **Investigating Science Life Skills**  ***Working Scientifically***  *Conducting Investigations*  Students:   * follow a plan to participate in an investigation Personal and social capability icon * use scientific equipment and materials accurately  Information and communication technology capability icon * engage in safe practices when participating in an investigation Work and enterprise icon * accurately record observations and data when participating in an investigation Literacy icon Numeracy icon   *Processing Data and Information*  Students:   * recognise that data and information can come from a range of sources, eg observations and measurements Numeracy icon * relate collected information and data to questions or hypotheses Critical and creative thinking icon * use appropriate scientific language when representing information or data Literacy icon   **English Life Skills**  *ENLS6-1*  Students:   * respond to and ask questions in familiar and unfamiliar contexts * use visual, multimodal or digital texts to communicate for familiar audiences and purposes  Information and communication technology capability icon   *ENLS6-2*  Students:   * view and respond to graphs, charts and maps in familiar contexts Numeracy icon   **Mathematics Life Skills**  ***Plans, Maps and Networks***  *Maps*  Students:   * recognise that maps represent real things * use maps to locate positions or gather information | **How do geological disasters occur?**  Review concepts of the Earth’s crust. While the Earth seems solid, the crust is broken into several large pieces called tectonic plates, which move due to convection currents within the mantle.  Locate continents on a world map or globe; cut out or supply students with the continents and demonstrate how Africa and South America appear to fit together. Place the continents together and investigate how a single continent broke apart, with each piece drifting to its current location. Encourage students to select and use language associated with area, position and movement while completing the activity.  Explore maps of the Earth showing crustal plate boundaries and record the names of the major crustal plates. List the continents and oceans located on various plates. Create a jigsaw of the Earth based on the crustal plates and draw the boundaries of the major plates on an inflatable globe. Research Alfred Wegener’s work and his evidence of continental drift.  I**nvestigation**: Continental drift  ***Teacher background****: the aim of this investigation is for students to consider how convection currents cause movement in the Earth’s tectonic plates. Students consider ways of observing and recording their findings as well as methods for conducting a safe investigation. Note: this investigation involves the heating of water in a suitable container.*  Model convection currents to demonstrate continental drift. Fill a heat-safe container or beaker with water, glitter and several small floating balls (such as sultanas or polystyrene balls) to represent the continental plates. Students observe what happens to the glitter and balls before and after the water is heated. Students draw the movement of the glitter and balls as the water heats; compare and describe how this demonstration is related to the movement of the Earth’s plates. Students to consider:   * How can I record my observations of the glitter and balls? * What happened to the glitter and balls as the water heated? * How can I communicate my observations with others? * How did I make sure this investigation was conducted safely?   Students may use scaffolds, graphic organisers, mind maps, dot points, video recordings, flip books or verbal responses to record their observations and present their findings. | Continental Drift – Science Channel  <https://youtu.be/rDKiNwTwaNw> |
| **Investigating Science Life Skills**  ***Working Scientifically***  *Questioning and Predicting*  Students:   * ask questions about the world around them https://lh5.googleusercontent.com/Rxtd35_bD9NYVAYTpCQ-l7NjzMfiyFajA_6a4YcahraxXOTfH4tnHYhUexf1uMPSXbOwgmNnpyg5qdPeM0mzCxt4kZSRo3k71lpcoUKMsqqj_fEDdSEoLDDRM41ErrQUfCaz07YL * make observations and pose questions based on these observations   *Conducting Investigations*  Students:   * recognise a plan as a sequence of steps https://lh5.googleusercontent.com/BaJe4_V7hOW-x1HTRBokL9dorYjTQQgjMCbVGhKlu6CWHO5webOqzPU3bIjnWKgc3mzujAsVntcPnKGg-HNd2P-f3MAD774pepFCOCtzf75c-reGcSd0KVsUdipv0YdLCTfxlVKX * follow a plan to participate in an investigation https://lh5.googleusercontent.com/Rxtd35_bD9NYVAYTpCQ-l7NjzMfiyFajA_6a4YcahraxXOTfH4tnHYhUexf1uMPSXbOwgmNnpyg5qdPeM0mzCxt4kZSRo3k71lpcoUKMsqqj_fEDdSEoLDDRM41ErrQUfCaz07YL * engage in safe practices when participating in an investigation https://lh5.googleusercontent.com/WVSnRyGnrqlCrqSS5v-anrdJeyEAzrmzIiGCgHA5OJdUeM-cCS7sZ7L1q4KU1DJHGVnzOB3HSZxQawqPOH2MDWicptTdg2Aj316dtBVlxMBzJCmuKPz_ZlS8HaFKfik1Fzg9rcXa   ***Scientific Models***  *Models to form Understanding*  Students:   * recognise that scientists, in order to simplify or help explain something in the world, develop models Work and enterprise icon * explore a specific scientific model Critical and creative thinking icon  Information and communication technology capability icon Literacy icon   *Constructing a Model*  Students:   * construct a scientific model using appropriate techniques and materials Critical and creative thinking icon  Information and communication technology capability icon   **English Life Skills**  *ENLS6-1*  Students:   * view visual, multimodal or digital texts for personal and educational purposes  Information and communication technology capability icon * use reading behaviours when engaging with a range of texts * create visual, multimodal or digital texts, including statistical representations, to communicate ideas https://lh3.googleusercontent.com/n0zZlSUFWK-J6GiESmY6WriA-shkYJBglOW__p2rVBSswIeZV2ZgXkgHfyAPUHp8N0ohVVjNKAp4vtPO5kEPci1V_HjvoDLaFjeVM_hd9j7rFh6RuokHdn0lvv4CAJPUHP-6eqqv   *ENLS6-5*  Students:   * use a digital library catalogue to find resources  Information and communication technology capability icon * access a range of texts to locate information   *ENLS6-6*  Students:   * use scaffolds to compose texts * engage in joint or collaborative construction of texts for a variety of purposes and audiences Work and enterprise * compose a range of texts in different modes and combinations of modes Critical and creative thinking icon * compose a range of informative texts * use a range of modes, media and technologies to organise and present ideas  Information and communication technology capability icon   *ENLS6-11*  Students:   * compose texts from different points of view Difference and diversity icon   **Mathematics Life Skills**  ***Plans, Maps and Networks***  *Maps*  Students:   * recognise that maps represent real things * use maps to locate positions or gather information | **How do geological disasters occur and what is their impact on the environment? –Volcanoes**  View *What is a Volcano* by STEM Learning UK*.* Questions for discussion:   * Where do volcanoes occur? * What is the difference between magma and lava? * What factors lead to volcanic eruptions? * What is the difference between an active, dormant and extinct volcano? * What impact can a volcanic eruption have?   Individually or collaboratively, students conduct a research investigation on volcanoes. Using online, print and multimodal texts, students present their findings to the class. Questions for research could include:   * What country has the most active volcanoes? Why? * In what ways are underwater volcanoes different to those on the land? * What and where is the biggest volcano? How big is it? Find another structure that is as tall as this volcano. * Where does the word volcano come from? * Is it safe for people to live near volcanoes? Why/Why not? * Why do people choose to live near volcanoes?   Students may present their findings in poster format; as a question and answer segment on a television show; a script for a speech or a digital presentation using technology such as PowerPoint or Prezi.  Using instructions from the Royal Society of Chemistry UK – *Volcano in the lab*, demonstrate a volcanic eruption through the Earth’s layers. Students to describe or draw their observations.  Explore the intensity levels of volcanoes by describing and comparing the magnitude and damage of famous volcanic eruptions throughout history. Create a visual display by graphing various volcanic eruptions from smallest to largest, comparing magnitude levels to other data such as death rates. Students plan, create and evaluate a scientific model of a volcano. Students consider their choices for the materials to make both the structure of the volcano and the magma, eg why would using modelling clay be a better choice than tissue paper? Students recreate a volcanic eruption in their model using bicarbonate soda mixed with vinegar (ensuring all safety requirements are adhered to). Questions for discussion could include:   * What comes out of the volcano? * Where does the magma come from? * How does the lava flow out of the volcano? * What happens to the lava after it flows out of the volcano? * What might happen to people living at the bottom of the volcano? * Does a model have to be 3 dimensional? What are other types of models?   Extension activity: Investigate the ratio of bicarbonate and vinegar mixture to create the magma. Students measure the flow rate of the magma with different ratios of bicarbonate and vinegar.  Plot the locations of recent volcanic activity on a world map. This could be completed using a digital map, printed map or inflatable globe. Ask students to make connections between the locations of volcanic activity with their previous maps of tectonic plates.  View the video *Behind the News – Volcanoes* to observe the dangers of living next to a volcano. Questions for discussion could include:   * Why are residents of Naples not afraid? * When Vesuvius erupted, why did the villagers survive? * What sort of volcanic eruption kills? Why? * How can scientists determine that a volcano may erupt, to give as much warning as possible?   Independently or as a group, read, listen to or view a narrative text that explores the effects of volcanic activity on people and communities. Students engage in pre-reading activities where possible by viewing and/or reading the cover and blurb of the book. Students make predictions about the themes and plot elements of the text.  As students engage with the text, complete a 5 senses report. Students imagine they were a character from the text and write, describe or draw what they would see, smell, taste, touch and hear during a volcanic eruption. | What is a Volcano? -STEM Learning UK  <https://www.stem.org.uk/rx34do>    Volcano in the lab – Royal Society of Chemistry  <http://www.rsc.org/education/teachers/resources/jesei/volcano/index.htm>  Behind the News –Volcanoes  <http://www.abc.net.au/btn/story/s2275687.htm> |
| **Investigating Science Life Skills**  ***Working Scientifically***  *Conducting Investigations*  Students:   * recognise a plan as a sequence of steps https://lh5.googleusercontent.com/BaJe4_V7hOW-x1HTRBokL9dorYjTQQgjMCbVGhKlu6CWHO5webOqzPU3bIjnWKgc3mzujAsVntcPnKGg-HNd2P-f3MAD774pepFCOCtzf75c-reGcSd0KVsUdipv0YdLCTfxlVKX * follow a plan to participate in an investigation https://lh5.googleusercontent.com/Rxtd35_bD9NYVAYTpCQ-l7NjzMfiyFajA_6a4YcahraxXOTfH4tnHYhUexf1uMPSXbOwgmNnpyg5qdPeM0mzCxt4kZSRo3k71lpcoUKMsqqj_fEDdSEoLDDRM41ErrQUfCaz07YL * accurately record observations and data when participating in an investigation https://lh5.googleusercontent.com/BaJe4_V7hOW-x1HTRBokL9dorYjTQQgjMCbVGhKlu6CWHO5webOqzPU3bIjnWKgc3mzujAsVntcPnKGg-HNd2P-f3MAD774pepFCOCtzf75c-reGcSd0KVsUdipv0YdLCTfxlVKX https://lh3.googleusercontent.com/n0zZlSUFWK-J6GiESmY6WriA-shkYJBglOW__p2rVBSswIeZV2ZgXkgHfyAPUHp8N0ohVVjNKAp4vtPO5kEPci1V_HjvoDLaFjeVM_hd9j7rFh6RuokHdn0lvv4CAJPUHP-6eqqv * work individually and/or collaboratively to conduct an investigation https://lh5.googleusercontent.com/WVSnRyGnrqlCrqSS5v-anrdJeyEAzrmzIiGCgHA5OJdUeM-cCS7sZ7L1q4KU1DJHGVnzOB3HSZxQawqPOH2MDWicptTdg2Aj316dtBVlxMBzJCmuKPz_ZlS8HaFKfik1Fzg9rcXa * use digital technologies to collect or represent qualitative information or quantitative data https://lh6.googleusercontent.com/WSefKq_SVlkCAk8JjIg-pKyEHoJ9mbq8vmhjNlaSXq0PM2NXsYXw6HhprbvvU0SC_O7S7pZxOTygyLn98r1oPNm-O5E79mQsI6M1JEU8xlv8c6iKp1oIe6_2wgLfuojrK4cfjYe5 https://lh3.googleusercontent.com/n0zZlSUFWK-J6GiESmY6WriA-shkYJBglOW__p2rVBSswIeZV2ZgXkgHfyAPUHp8N0ohVVjNKAp4vtPO5kEPci1V_HjvoDLaFjeVM_hd9j7rFh6RuokHdn0lvv4CAJPUHP-6eqqv   *Analysing Data and Information*  Students:   * recognise representations of data Numeracy icon * describe data and information collected Literacy icon Numeracy icon * draw conclusions from data and information gathered in an investigation Critical and creative thinking icon   ***Scientific Models***  *Models to form Understanding*  Students:   * recognise that scientists, in order to simplify or help explain something in the world, develop models Work and enterprise icon * explore a specific scientific model Critical and creative thinking icon  Information and communication technology capability icon Literacy icon   *Constructing a Model*  Students:   * construct a scientific model using appropriate techniques and materials Critical and creative thinking icon  Information and communication technology capability icon   **English Life Skills**  *ENLS6-2*  Students:   * view visual, multimodal or digital texts for personal and educational purposes  Information and communication technology capability icon * use reading behaviours when engaging with a range of texts * create visual, multimodal or digital texts, including statistical representations, to communicate ideas https://lh3.googleusercontent.com/n0zZlSUFWK-J6GiESmY6WriA-shkYJBglOW__p2rVBSswIeZV2ZgXkgHfyAPUHp8N0ohVVjNKAp4vtPO5kEPci1V_HjvoDLaFjeVM_hd9j7rFh6RuokHdn0lvv4CAJPUHP-6eqqv   *ENLS6-5*  Students*:*   * recognise that information can be gathered from a number of sources * access a range of texts to locate information   *ENLS6-6*  Students:   * compose texts independently or with a group Work and enterprise * use scaffolds to compose texts * compose a range of texts in different modes and combinations of modes Critical and creative thinking icon * compose a range of informative texts * use a range of modes, media and technologies to organise and present ideas  Information and communication technology capability icon   *ENLS6-11*  Students:   * recognise that texts can explore issues relating to our world Sustainability icon Ethical understanding icon Civics and citizenship icon * compose texts from different points of view Difference and diversity icon   **Mathematics Life Skills**  ***Number and Modelling (Algebra)***  *Modelling*  Students:   * display data from experiments or real-life situations in simple graphs Personal and social capability icon * describe trends evident in graphs of data Creative and critical thinking capability icon Literacy capability icon * use digital technology to create graphs from tables of data or tables from graphs Information and communication technology capability icon   ***Measurement***  *Time*  Students:   * measure the time taken for various events * estimate and measure passage of time using a range of devices including stopwatches and personal devices  Information and communication technology capability icon Personal and social capability icon | **How do geological disasters occur and what is their impact on the environment? –Earthquakes**  Using visual, tactile or auditory stimulus materials introduce the concept of earthquakes. Questions for discussion could include:   * What are some features of an earthquake? * What happens when the Earth’s plates move against each other? * What varieties of damage can an earthquake cause? * Can all earthquakes be felt and cause damage? * What is the Richter scale and what does it measure? * What is the Mercalli scale and what does it measure? * What is the use of having 2 different scales to measure the same thing? * How can people and communities prepare for an earthquake?   Revisit the key terms word bank previously created and revise the terms ‘epicentre’, ‘aftershock’, ‘magnitude’ and ‘seismograph’.  Students explore recent earthquake activity across the planet. Using the map previously marked with volcanoes, students highlight areas most affected by earthquakes. Students make connections between earthquake and volcanic activity, linking this to the position of plate boundaries.  **Investigation**: Shake table  ***Teacher background****: The aim of this investigation is for students to create a model to replicate the movements of the Earth during an earthquake and observe the impact on buildings and structures and to consider if the height and shape of the buildings will affect the movement and damage.*  Using instructions from *Design Squad Global,* studentsbuild a ‘shake table’. Using blocks or toy construction bricks, students construct a simple building and observe the effects the movement of the table has on the building. Students measure and record the time taken for the building to collapse. Students gradually increase the height of their building and observe the difference in movement when placed on the shake table. Students record their observations and findings using a table or chart and as a group, compile collected data into a digital graph. Questions for discussion:   * Which size building moved the least? * Which size building showed the most movement? * Did the height of the building change the time taken for the building to fall during the earthquake? * Why would the height of a building be important to communities who live in areas of earthquake activity? * Which shapes seemed to make the buildings more stable?   Students could also experiment with different design choices for the building and observe the difference when placed on the shake table.  Individually or as a group, read, view or listen to a range of nonfiction texts that describe the impact of earthquakes on people and communities. Examples include:   * [ABC News](http://www.abc.net.au/news/2014-12-28/newcastle-earthquake-25th-anniversary-survivors-share-stories/5989570) – Newcastle earthquake anniversary: Survivors share their stories 25 years after Australia's worst quake * [NBN TV News Australia](https://www.youtube.com/watch?v=RAtJMu14j8s) - Newcastle Museum – Newcastle Earthquake 1989 * [Children of the Earth](http://www.coeworld.org/news/childrens-stories-nepal-earthquake) – 25 stories written by students about the Nepal Earthquake 2015 * [San Francisco Virtual Museum](http://www.sfmuseum.org/1906/ew.html) – Eyewitness accounts of the 1906 earthquake.     Construct a timeline of the events before, during and after the earthquake; communicate a summary of what happened during each stage. Students imagine they are a television news journalist reporting from the scene of the earthquake. Students describe what is happening as they are reporting and compose a list of questions they could ask an eyewitness. Students could role-play the scene in pairs, compose a scripted conversation or design a visual tableau using models or figurines.  Research the impact of the 1989 Newcastle earthquake by navigating to the online *City of Newcastle Earthquake Database* and discussing questions on *Disaster Resilient Australia –Earthquakes* considering:   * Where was the epicentre of the Newcastle earthquake? * How far away from the epicentre was the Newcastle earthquake felt? * What was the magnitude of the earthquake? * How many lives were lost? * What was the size of the aftershock? * How did the emergency services respond to the earthquake?   Students use scaffolds, mind maps, graphic organisers, heading or dot points to structure the presentation of a text such as an information report, fact file or brochure.  **Additional activities**:  Research how seismographs work. View [*Geology For Kids, The Study of Our Earth – How a Seismograph Works*](http://kidsgeo.com/geology-for-kids/0044B-earthquakes.php) and [*CSIRO’s – Earthquake detector*](http://www.csiro.au/en/Education/DIY-science/Earth-and-Space-sciences/Make-an-earthquake-detector). Construct a seismograph model. | Seismic Shaker - Design Squad Global  <http://pbskids.org/designsquad/build/seismic-shake-up/>  City of Newcastle Earthquake Database – Newcastle Cultural Collections  <http://collections.ncc.nsw.gov.au/keemu/pages/nrm/index.htm> |
| **Investigating Science Life Skills**  ***Working Scientifically***  *Questioning and Predicting*  Students:   * make observations and pose questions based on these observations   ***Scientific Models***  *Models to form Understanding*  Students:   * recognise that scientists, in order to simplify or help explain something in the world, develop models Work and enterprise icon * explore a specific scientific model Critical and creative thinking icon  Information and communication technology capability icon Literacy icon   *Constructing a Model*  Students:   * investigate a scientific idea that has been represented using a model Critical and creative thinking icon   **English Life Skills**  *ENLS6-3*  Students:   * read short or extended literary texts for pleasure or educational purposes * read and respond to a range of personal, imaginative and informative texts taken from literature and other sources   *ENLS6-6*  Students:   * compose a range of texts in different modes and combinations of modes Critical and creative thinking icon * compose a range of texts in response to narrative texts * use a range of modes, media and technologies to organise and present ideas  Information and communication technology capability icon   *ENLS6-11*  Students:   * identify the language forms and features that indicate point of view, values and attitudes in texts https://lh6.googleusercontent.com/EdvWh_GyIWeWkoGzdGdG9BqJEgLeSCWG-ycm_Ma_NHT-SdquLmMhWNsXEBePNJdnyi80i2boeVBa6HKHOXPlb8dY9U3FQdu17gGxh2NIB93Ce9_NblFf7MPQ2sow38VEV8vn-tit * identify points of view, values and attitudes presented in a range of texts Sustainability icon Difference and diversity icon   **Mathematics Life Skills**  ***Measurement***  *Length*  Students:   * recognise language and comparative language that relates to length Literacy icon * estimate and compare lengths and distances Critical and creative thinking icon   ***Plans, Maps and Networks (Networks)***  *P1.2: Maps*  Students:   * recognise that maps represent real things * use maps to locate positions or gather information | **How do geological disasters occur and what is their impact on the environment? –Tsunamis**  Using visual, tactile or auditory stimulus materials, introduce the concept of tsunamis. Questions could include:   * Where does the word ‘tsunami’ come from? What is the meaning of the word? * How are earthquakes and tsunamis connected? * What happens to the ocean when the plates underneath move? * Who is most likely to be affected by tsunamis?   Explore the height of tsunami waves using information from *Live Science*. Students to compare the height of tsunami waves to everyday objects using language relating to length, eg taller, shorter, longer. Students identify units of measurement appropriate for measuring the height of tsunamis.  Create a tsunami simulation model using a large container such as a tray. Students consider what materials could be used to represent the shoreline (eg sand), the ocean (eg a water source), buildings and houses (eg toys or blocks). Students observe and describe the movement of the water as it approaches and retracts from the shorelines. Students describe the effect of the water movement on the buildings, making connections to real-world events.  Using digital or printed maps, students measure the distance tsunamis have travelled from the epicentre before reaching land. Plotting the epicentre of the 2004 Indian Ocean tsunami, students estimate which countries where affected first and compare this to factual information provided by the Australian Bureau of Meteorology. Students make connections between the distance the tsunami waves travelled and the time taken for impact on coastal lands.  Individually or as a group, students engage with texts that explore the impacts of a tsunami on people or communities. As students engage with the text they consider what happened, who was involved and how they were affected. Students explore the connections between the story and the language forms and features used to describe the tsunami, eg descriptive language, imagery, verbs, adjectives and jargon.  Create a text which explores the perspective of a character that has been affected by a tsunami. Students could choose from a range of multimodal texts, including:   * video diary or blog * journal entry * collage * written or performed monologue * social media texts.   Students consider how different characters from the texts have different points of view and were affected by the tsunami in different ways.  Create a tsunami hazard map indicating risk levels for various regions along the Australian coast, using a key. | Tsunami – Live Science  <https://www.livescience.com/13176-history-biggest-tsunamis-earthquakes.html>  Tsunami Facts and Information – Australian Bureau of Meteorology  <http://www.bom.gov.au/tsunami/info/> |
| **Investigating Science Life Skills**  ***Working Scientifically***  *Questioning and Predicting*  Students:   * ask questions about the world around them https://lh5.googleusercontent.com/Rxtd35_bD9NYVAYTpCQ-l7NjzMfiyFajA_6a4YcahraxXOTfH4tnHYhUexf1uMPSXbOwgmNnpyg5qdPeM0mzCxt4kZSRo3k71lpcoUKMsqqj_fEDdSEoLDDRM41ErrQUfCaz07YL   **English Life Skills**  *ENLS6-4*  Students:   * use digital literacy skills to locate and comprehend information in digital texts  Information and communication technology capability icon * comprehend and respond to a variety of texts in a range of formats to obtain information Critical and creative thinking icon * identify main ideas and supporting evidence in texts   *ENLS6-4*  Students:   * use language features and textual form suitable to purpose, audience and context when composing texts Critical and creative thinking icon * compose a range of texts in different modes and combinations of modes Critical and creative thinking icon * compose a range of informative texts   **Mathematics Life Skills**  ***Measurement***  *Time*  Students:   * recognise language that relates to time Literacy icon * estimate and measure passage of time Personal and social capability icon * explore simple rates related to time | **How can we help people and communities affected by geological disasters?**  Explore the role of early-warning systems used locally and internationally to detect volcanic and seismic activity. Pose the question ‘how does having an early-warning system help to reduce the impact of geological disasters?’ Students consider how much time they would need to evacuate an area if a local disaster warning was issued.  Using information from the Australian Institute for Disaster Resilience website, discuss the role of the Pacific Tsunami Warning System and Joint Australian Tsunami Warning Centre in helping to identify seismic activity and changes in sea levels that may indicate a tsunami.  Explore methods for survival and reducing risks during an earthquake. Students complete the *ABAG Home Contents Safety Quiz* exploring ways to prevent further injury or damage during an earthquake, eg locking cupboard doors to prevent plates from falling out and minimising spills of chemicals.  As a group, define the term ‘assistance’ and create a visual display using synonyms such as support, help, relief and aid. Students consider what types of assistance people might need following different disasters and rank these in order of importance. Encourage students to explain their choices and share their ideas.  Investigate local and international organisations that provide disaster relief, eg The International Red Cross, World Vision, Oxfam, Doctors without Borders, CARE, World Health Organization. Students select one organisation to explore in more detail and compose a visual, multimodal or digital text encouraging public awareness, support and donations.  Independently or in groups, students select one geological disaster studied throughout the unit. Using their previous knowledge from classroom lessons and additional research, students investigate the ways people and communities can prepare for their selected disaster and present their findings to the class. Students could present their findings as a fact file, brochure, poster, scripted infomercial or report. Students should consider the following questions when collecting and presenting information:   * What is the disaster and why are people at risk? * What early-warning systems are being developed or used? * Where can people go for official warnings and notices? * How should people prepare themselves and their communities for this disaster? * Should people stay in their homes or evacuate to safer areas? * What items would they need during this disaster? * What items would be unnecessary or useless during this disaster? * Who could people go to for assistance before, during and after the disaster? | Australian Institute for Disaster Resilience  <https://emschools.org.au/>  ABAG Home Contents Safety Quiz  <http://www.abag.ca.gov/bayarea/eqmaps/fixit/quiz/nonstructquiz.html> |

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| Reflection and evaluation |