| VR LEARNING TASK  Volcanoes in VR | Learning area |
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| Science / Design and Technology |
| Year level |
| Year 8 |
| Duration |
| 90 minutes |

| Task summary  Students will understand and explore volcanic eruptions and how the landscape changes due to this extreme weather event using VR. |
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| Session overview | Students will identify how the Earth’s surface changes due to extreme weather, like volcanic eruptions, based on their completion of the Volcanoes Experience Board and a short, simple animation. |
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| Digital technologies | * VR * AR * Robotics * Drones * Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Required resources | **Hardware:**   * Immersive Virtual Reality (IMVR) headsets * Handheld Virtual Reality (HHVR) headsets * Mobile devices * Smartboard / Interactive whiteboard * Laptops or tablets   **VR videos:**   * [Volcanos - An Immersive Experience (Extended Version) - 360°/3D](https://www.youtube.com/watch?v=QdVzI7yNzHw)(4:52) - A VR video that shows a simulated experience of viewing a volcanic eruption and explaining how extreme weather used to be viewed by humans in ancient times. * [How Volcanoes Affect Earth's Climate Over Millions of Years 360° I NOVA I PBS](https://www.youtube.com/watch?v=GZyboz34bv8)(2:07) - Watch how volcanoes belch carbon dioxide and other gasses into the atmosphere, which has slowly changed Earth's climate for millions of years. * [Insta360 VR: Flying Over Iceland Volcano - A Virtual Reality Experience](https://www.youtube.com/watch?v=y9J7RUzlkz4)(1:39) - A VR experience viewing an erupting volcano. * [Lassen Volcanic National Park in 360° Virtual Reality](https://www.youtube.com/watch?v=JzDJoFQwOAc)(3:28) - This is a brief virtual VR tour of Lassen Volcanic National Park, which is home to several volcanoes. Its peaks tell the story of its eruptive past and hot water continues to shape the land.      * [Volcano Eruption 360/VR Video - Minecraft Animation](https://www.youtube.com/watch?v=fzq7pGSqaFg)(4:55) - A Minecraft animation in VR showing a volcanic eruption.   **Apps:**   * [Google Earth VR](https://store.steampowered.com/app/348250/Google_Earth_VR/) - An IMVR app to tour different volcanoes around the world. * Any modelling or animating software such as [Minecraft EDU](https://education.minecraft.net/en-us/homepage) or stop motion apps like [Stop Motion Studio](https://www.cateater.com/).   **Teaching resources**:   * <placeholder for teaching deck> - Download a copy for your own use. * <placeholder for student digital notebook> - Download a copy and distribute it to students via email or the learning management system. |
| Other resources to try (optional) | **HHVR app:**   * [Google Earth VR](https://store.steampowered.com/app/348250/Google_Earth_VR/) - Students can explore different parts of the world in VR. For this task, teachers can get students to use the search function to view Budj Bim and Mount Gambier. They can also search for other volcanoes from anywhere in the world.   **Tutorials:**   * [01 First Steps - Stop Motion Studio Tutorial](https://www.youtube.com/watch?v=-DzV3-1lnTQ)(2:08) - A short tutorial to introduce the basic steps of using Stop Motion Studio.   **Miscellaneous:**   * [VR/AR Safety Poster](https://drive.google.com/file/d/1vMsHdVpuF-DnnHzKcPd3-yFeMyBEpmNs/view?usp=sharing) |
| Planning and preparation *NOTE: This learning task may be introduced in the middle or at the end of the unit.* | **Assumptions**  For session 1, students should have:   * Prior lessons on geological changes and extreme weather events. * Briefing on the safe and proper use of HHVR and IMVR equipment. * Basic training in using Google Earth VR. * Basic knowledge and skills needed for the chosen volcanic modelling or animating approach (e.g., [Minecraft EDU](https://education.minecraft.net/en-us/homepage), [Stop Motion Studio](https://www.cateater.com/), etc).   **Additional preparations for teachers**  Teachers should make sure that:   * All apps are installed and working properly. * All devices and batteries are fully charged and in working order. * Suggested videos have been reviewed and deemed suitable for their respective students. * All additional materials such as presentation decks are reviewed and ready for use. * HHVR headsets and mobile devices are distributed or allocated accordingly before the lesson starts, if possible, to save time. * Students may also be pre-assigned in groups to save time. * Students have the required log-ins/access if using Minecraft EDU and/or another creation app.   **Additional notes**   * If using IMVR resources, teachers should plan for creating learning stations depending on the number of IMVR headsets available at the site and the number of students in each class. |

# Task sequence

| 1 Prior knowledge  (5 - 10 mins) | | Using slide 2 of <placeholder for teaching deck>, as a class, discuss what students remember about extreme weather from a previous lesson:   * What types of extreme weather do they remember? (e.g., earthquakes, volcanic eruptions, landslides, etc) * Do they recall how volcanic eruptions occur? * What happens in a volcanic eruption? * Do they know how landscapes change when extreme weather occurs? |
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| 2  Provocation (5 - 10 mins) | | Watch the video on slide 3 of the teaching deck as a class: [Volcanos - An Immersive Experience (Extended Version) - 360°/3D](https://youtu.be/QdVzI7yNzHw) (4:53)  Show an example of the <placeholder for student digital notebook> and guide students on how to fill out the Y chart using text boxes.   * What did they SEE on the video? * What did they THINK while watching the video? * What did they FEEL while watching the video? |
| 3 Activities  (45 - 60 mins) | | **Station introduction: (5 mins)**   1. Tell students that the class will be working in groups that will go through three learning stations. Explain the tasks that need to be completed in each station and say that the groups will have approximately 15 minutes in each station. Students can add their VR experience reaction to the Volcanoes Experience Board. 2. Set up and explain the following stations to students using slide 4 of the teaching deck, then begin rotations of about 15 minutes in groups.   **Station 1: IMVR** - Each group will have approximately 15 minutes on this station (4 to 5 minutes per student). Students should be aware that they would be working with partners, helping each other put headsets on, and ensuring each student would stay within the ‘virtual fence’.  **Station 2: HHVR** - Students will view the provided VR videos and answer the reflection questions found on slide 7 slide the student digital notebook. Students may also go on Google Earth on their devices to view additional volcanoes in 3D. Some examples of Volcanoes for students to visit are :  1. Mount Kilauea, Hawaii, USA: One of the most active volcanoes in the world, known for its frequent eruptions and lava flows.  2. Mount Vesuvius, Italy: Famous for its eruption in AD 79, which destroyed the Roman cities of Pompeii and Herculaneum.  3. Mount Fuji, Japan: An iconic symbol of Japan, Mount Fuji is a dormant volcano with a perfectly symmetrical cone.  4. Mount St. Helens, Washington, USA: Known for its catastrophic eruption in 1980, which dramatically changed the landscape of the area.  **Station 3: Animation Creation?** - Students will create a short volcanic eruption animation that will reflect their understanding of the changes on the Earth’s surface, specifically the changes through the magma chamber, vent, and crater.  NOTE: Students may need extra time to complete their animations. This may be assigned as a work-in-progress or as homework. |
| 4 Check for understanding  (5 - 10 mins) | | To conclude this learning task, teachers can ask students to present their animations or email them for assessment.  Teachers can also facilitate a discussion about the VR experiences the students encountered. |

| Differentiation for students with additional needs | Extension ideas | Video tips |
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| Students who may experience motion sickness from [Google Earth VR](https://store.steampowered.com/app/348250/Google_Earth_VR/), can use the [Google Earth web browser](https://earth.google.com/web/@-14.66094238,132.49560004,2450.89960963a,22249302.23668098d,35y,0h,0t,0r/data=OgMKATA).  Students may be more comfortable viewing the VR animation in a browser window on their device.  Students can complete the provocation task using concrete materials, such as sticky notes with their ideas. | Consider the impacts of volcanic eruptions. Explore how tectonics shape places such as Krakatoa, Indonesia. (Geography) | The video for this learning task talks about how to use Google Earth to search for volcanoes in 3D mode. |

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# Curriculum Connections

| Australian Curriculum Version 9 | **Year 8 - Science**  Investigate tectonic activity including the formation of geological features at divergent, convergent, and transform plate boundaries, and describe the scientific evidence for the theory of plate tectonics (AC9S8U03)  **Year 8 - Design and Technology** Generate, test, iterate, and communicate design ideas, processes, and solutions using technical terms and graphical representation techniques, including using digital tools (AC9TDE8P02) |
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| Cross-curriculum priorities | * Aboriginal and Torres Strait Islander Histories and Cultures * Asia and Australia's Engagement with Asia * Sustainability |

| General capabilities | * Literacy * Numeracy * Digital Literacy * Critical and creative thinking * Personal and social capability * Ethical understanding * Intercultural understanding |
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