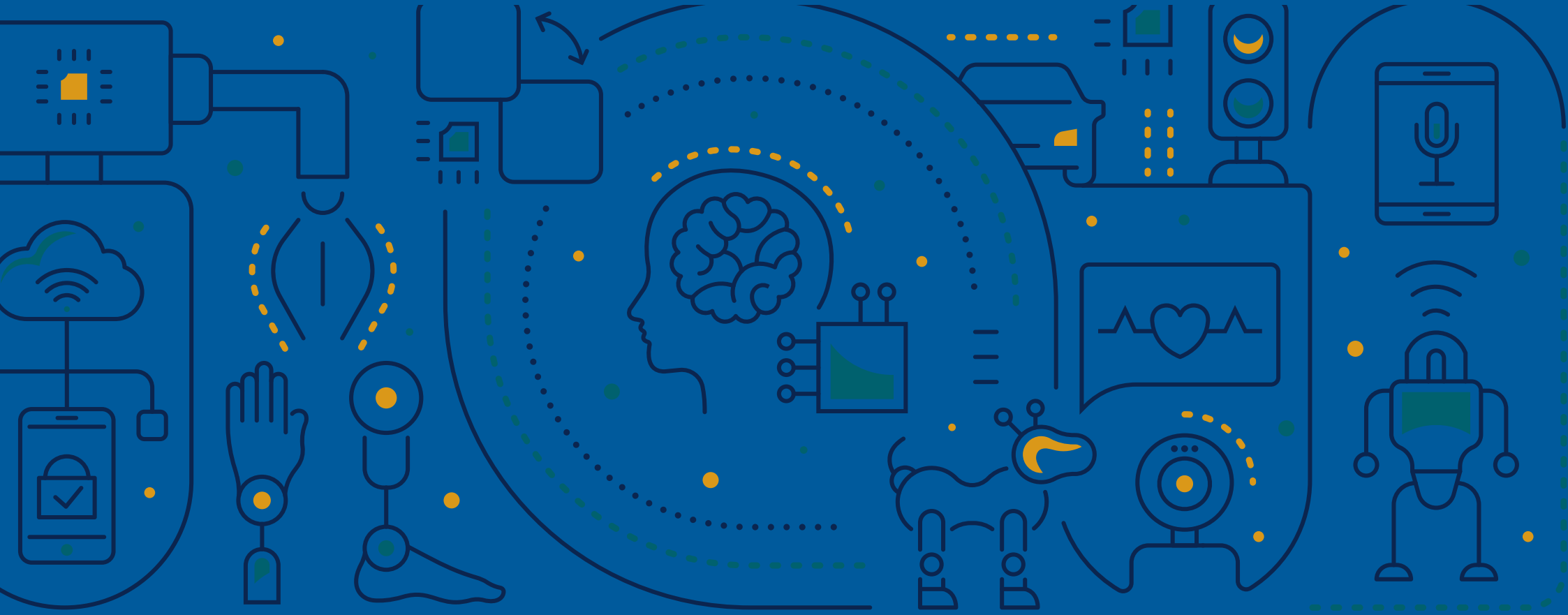

Teacher's guide to Immersive Technologies (Primary)

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What are Immersive Technologies?

New technologies are being released every day and the immersive technologies are expanding rapidly. These technologies also known as Extended Reality integrate virtual digital content with the physical environment to enable the user to engage with a blended experience of the real, and the virtual. Examples include:

AR – Augmented Reality is an interactive experience of placing digital content (text or images) over a physical environment to provide additional information to users. This occurs through the camera of a handheld device. Well-known examples are Pokémon Go and Wizards Unite.

VR – Virtual Reality is an artificial simulated environment that can be explored in 360 degrees. It is experienced through a headset with virtual scenes and objects that appear to be real and replaces the user's physical environment making them feel immersed in their surroundings. Popular headsets include Oculus Quest and PlayStation VR.

MR – Mixed Reality is the combination AR and VR with digital content blending with the physical environment that appears as an extension of reality. The virtual objects are superimposed over the real world and move and act as though they are real such as with the Microsoft HoloLens headset.

AI – Artificial Intelligence is the development of computer systems (machines) that require human intelligence and capabilities such as reasoning, learning, planning and creativity to perform a task. These systems can process large amounts of data in ways that humans cannot. Some recent online generators include ChatGPT and DALL·E.

Why use them?
Immersive technologies offer a unique ability to immerse students in highly interactive sensory experiences in a stimulating environment. Students can engage and connect through touch, sound and visual content that has the capacity to transform learning, It offers a different way of visualising complex concepts and interact in a more realistic way. These new technologies can provide practical training opportunities in a safe environment. For example, medical students can learn using realistic representations of the human body and practice medical procedures virtually. Firefighters, police, and pilots can learn in a controlled environment. Consumers can choose furniture for their home; test drive a car or choose a travel experience.

How to start?

- Develop a plan, have goals, and choose the tool to fit the purpose of what you are teaching.
- Move from 2D into 3D learning with the following 16 examples that provide an opportunity to explore the different types of immersive technologies available and how they could integrate into your teaching and learning program across various learning areas of the Australian Curriculum.

Quivervision	RakugakiAR	Wonderscope	Arility
			
QuiverVision (free and paid) provides experiences in AR for young children in a simple and fun way. Imagine seeing your pages come to life in front of your eyes! Engaging, animated 3D experiences - that's QuiverVision. Download and print ready-made templates, colour the characters, scan with the QuiverVision app and bring them to life. Consider a subscription to access the education dashboard with over 200 templates and activities to choose from.	**RakugakiAR (free)** brings your drawings to life! Here is a chance for students to see their own character creations jump off the page and move with the magic of AR. Draw a character on paper, scan it using the RakugakiAR app, press a button and watch it jump off the page, and into the real world. Your character will walk around on the table or floor surface. Students can add more characters to their scene and use the photo/video feature to capture a live story.	**Wonderscope (free and paid)** is an augmented reality storytelling experience that has vibrant cartoon-style visuals, cheerful music, voice acting, and interaction that feels more like being inside a book. Students can get physically involved with the AR experience. The animated story takes place around you like a miniature play. Help the story characters to solve problems along the way and tap the screen to see cartoon like movement. There are currently five interactive stories available.	**Arility (free)** is a health and road safety education experience with 360-degree AR visuals and sound effects. Students interact with an avatar character in dangerous travel situations and identify making good choices to stay safe. Safety areas include roads, floods, railways, driveways, footpaths and more. The health lessons include sharp safe, blood safe and germ safe. There is also a teacher dashboard to monitor student progress.
Try the free Dot Day or Pi Day activities with lesson plans	**Draw characters on paper and turn a 2D story into 3D.**	**Read story lines aloud to engage with moving characters.**	**Role play safe road crossing near a bus and with a bike.**
Quivervision	RakugakiAR	Wonderscope	Arility

Augmented Reality ideas for Early years students

GeoGeek AR	Plantale	Brainapse	Froggipedia
			
GeoGeek AR (free) teaches world geography skills. Use a realistic representation of the earth as a 3D model, engage students to discover planet earth. Explore topics such as countries, cities, flags, rivers, oceans, mountains and more. See the world from both a satellite and political map view. There are 8 learning units included for free with different levels of difficulty for students.	**Plantale ($1.49)** takes students on a stunning AR journey exploring living things. Observe the stages of growth in a plant's life from a simple seed to a reproducing plant. Students can explore the anatomy and morphology of plant parts. Observe the stages of growth from a seed to a plant and experience how a flower blooms from a bud. Investigate the root, stem, leaf and flower systems and discover how plants function internally and externally.	**Brainapse ($2.99)** enables users to explore and learn more about the human brain through AR. Explore the anatomy, structure and functions of the human skull and brain. Discover the internal and external areas of the skull and brain. Learn about the function of brain cells and experience how the brain communicates with the five senses. There is a quiz called Brain Hunt where users find parts of the brain and reassemble into the model.	**Froggipedia ($5.99)** is a realistic anatomy app that provides AR exploration into the life of frogs. It includes lifelike visuals and interactive displays for students to examine the frog's anatomy closely. Dissect and discover the complex structure of a frog. Place the virtual frog on a surface to examine features such as internal organs and body systems at your fingertips. Analyse skeletal, muscular and digestive systems and remove organs to examine them in detail.
Try the top 20 quiz to test knowledge of world geography.	**Grow a virtual plant providing it with what it needs to grow.**	**Explore the skull and peel back the layers to see what's inside.**	**Look in detail at each phase of the life cycle from egg to frog.**
GeoGeek AR	Plantale	Brainapse	Froggipedia

Augmented Reality ideas for Primary years students

AR Makr	Adobe Aero	Halo AR	Assemblr EDU
AR MAKR (free) is a creative tool to transform student creations from 2D to 3D virtual objects. Students can bring their own creativity and drawings into a space for story-telling. Walk through a book scene, a story map or tell your own story. Make a solar system model, aerial map of your community, or build a food chain. Explore designing your own shapes, mazes, and prototypes. Recreate historical events, or virtual tours.	**Adobe Aero (free)** helps you build, test, view, and share interactive and immersive AR experiences with a combined authoring and viewing platform and QR code option to launch. Visualise your 2D design in the 3D real world on both horizontal and vertical surfaces. Add animation and sound to objects and bring them to life with preset motion triggers and sound effects. Make a card with moving elements or a virtual tour of the school.	**Halo AR (free)** empowers the user to create with AR by connecting digital content to the physical world. It is the perfect replacement for HP Reveal and Aurasma and perfect for those new to creating. It is the quickest AR creation tool available. Snap a photo of any flat object. Choose a photo, video, or 3D model to overlay on top of it.	**Assemblr EDU (free + paid)** is a simple platform to make learning a fun and interactive experience in AR. It brings difficult concepts to life and enables students to interact with content in the classroom. Teachers can present interactive lessons in 3D with photos, videos, and texts in a minute. There are also free lesson plans, modules, and educational content readily available in the app. This experience encourages students to learn and understand what they are studying through creating and designing.
Create and record an interactive scene and add virtual objects.	**Build a museum or art gallery with virtual objects.**	**Build a Scavenger Hunt or moving packaging labels.**	**Explore habitats, build the water cycle, create a community.**
AR Makr	Adobe Aero	Halo AR	Assemblr EDU

Create Augmented Reality

Seek	Planets	Merge	CoSpaces
Seek (free) by iNaturalist is a citizen science app based on AI image recognition. Find a mushroom, flower, or bug, and scan it to find out more. Seek shows a list of commonly recorded insects, birds, plants, and amphibians through its online database to help students identify plants and wildlife. Users can earn badges for finding plants and animals and read a brief profile of each found species along with a map of where that plant or animal has been spotted by other observers.	**Planets (free)** by Q Continuum is a 3D guide to the solar system which shows one revolution cycle of the Earth around the sun. The 3D view of the sky provides several different ways for you to identify and gain information about objects in the sky. Learn what the sky looks like at frequencies outside of the visible spectrum. Spin the Earth or the planet of your choice with one finger.	**Merge** has 3 apps that interact with the foam Merge Cube. **Merge Explorer** enables students to learn science concepts easily with over 100 science simulations. **Object Viewer** allows students to learn about rocks and minerals, mammals, reptiles, lifecycles, cells, and so much more. **HoloGlobe** has real-time satellite data and simulations for students to learn about the Earth using scientific data, including rainfall, cloud coverage, oceans, land temperature, and more.	**CoSpaces (free and paid)** is a platform that enables users to create and engage with mixed reality. It works as a website inside the browser and is a downloadable app. Students can get creative through building, coding, and exploring their own designs. There are free downloadable lesson plans available for teachers to use and customize for their classes. It also contains an education platform with easy-to-use features.
Photograph plants and animals and identify them as a class.	**Identify planets, stars and constellations during the day.**	**Experience virtual simulations and objects in your hand.**	**Develop a virtual scene with moving characters and text.**
Seek	Planets	Merge Apps	CoSpaces

Other Immersive Technologies

Produced by the Computer Science Education Research Group (CSER) The University of Adelaide as part of the Supporting Artificial Intelligence in Schools Initiative - an Australian Government Department of Education program aimed at engaging students and supporting teacher professional development.

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