

## Integrating spatial technologies with curriculum requirements

This document contains practical ideas and examples as to how you, as a teacher, can use the *GIS for Schools* program to deliver the F-10 Australian curriculum to your students.

### F-10 Geography curriculum

#### Context

The [Australian Curriculum](#) mandates that in Year 7 Geography to Year 10 Geography, digital and spatial technologies need to be used under the **Geographical Inquiry and Skills** strand.

The use of GIS spatial technologies is required in the **Collecting, recording, evaluating and representing** process, as well as the **Interpreting, analysing and concluding** process. Each year's content descriptors clearly refer to these requirements.

Esri Australia's Education team offers the *GIS for Schools* program freely to all schools in Australia, providing teachers with the means to ensure they can meet curriculum requirements in their delivery of the subject.

#### Available applications in the *GIS for Schools* program

There are a host of available applications that come as a part of the *GIS for Schools* program. Three applications are particularly useful – and easy to navigate – for teaching and delivery purposes:

1. **ArcGIS Online** allows you to quickly create maps, with either your own data or hosted feature layers. Users can share maps and analyse data too e.g. create choropleth maps.
2. **Survey123** provides you with the ability to create and design your own surveys. Once survey data has been collected, users can analyse and map their results. This application is great for supporting field trips.
3. **StoryMaps** is a great application for delivering storytelling, or knowledge and content, with the support of custom maps. It is effective in delivering content, similar to a PowerPoint, but enhances this delivery with interactive custom maps and other media, including text, photos, and videos.



## Year 7 Geography

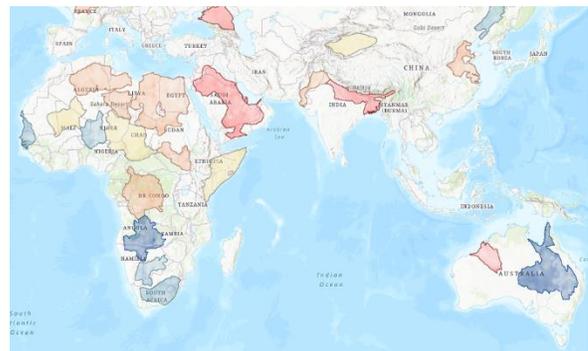
There are two units of study in the Year 7 curriculum for Geography: 'Water in the world' and 'Place and liveability.' When using spatial technologies, such as ArcGIS Online, to support the delivery of these units, consider which of the three applications outlined earlier would best suit the content or assessment you are planning to deliver.

Here are three ways we have used GIS applications to help deliver content:

### 1. Creating an ArcGIS Online map to explore [Water: forms and availability](#)

In this learning material we explore:

- Forms of water (solid, liquid, gas)
- Sources of water (rivers, lakes, oceans etc.)
- Total world annual precipitation
- Availability of water (surface water and groundwater)



### 2. Creating a survey in Survey123 to explore the environmental liveability of a high school

In this survey, we explore 'Place and liveability' by looking at the environmental welfare of any school. Questions were designed so that students could visit different school gardens and record data about the health of their local environment.

How many pieces of litter are evident in the garden?\*

Pick one response.

<input type="radio"/> 0	<input type="radio"/> 1-5	<input type="radio"/> 6-10	<input type="radio"/> 11-15	<input type="radio"/> 16+
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Give the quality of the soil in the garden.\*

1 star being lower quality and 5 stars being higher quality.

### 3. Use Map Notes in ArcGIS Online to create a case Study focusing on the [liveability of a public school](#)

In this learning material, we explore the social, environmental and economic features of a school and how they add to, or detract from, the liveability of the school.

By adding our own map notes we were able to map features like water bubblers, waste and recycle bins, ball sports areas, green spaces, and more.



## Year 8 Geography

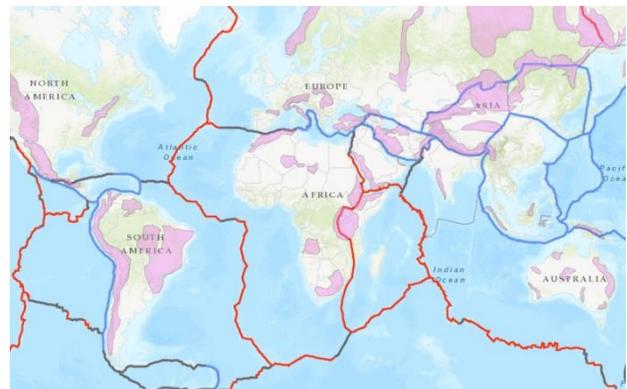
There are two units of study in the Year 8 curriculum for Geography: 'Landforms and landscapes' and 'Changing Nations.' When using spatial technologies, such as ArcGIS Online, to support the delivery of these units, consider which of the three applications outlined earlier would best suit the content or assessment you are planning to deliver.

Here are two ways we have used GIS applications to help deliver content:

### 1. **Creating an ArcGIS Online map to explore how mountains are formed.**

In this learning material, we created an ArcGIS Online map and added feature layers to support teaching the subject of mountain formation in the unit 'Landforms and landscapes.' Feature layers include:

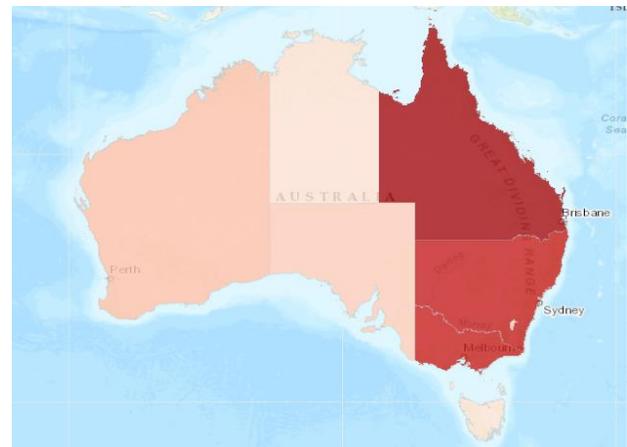
- World mountain ranges
- Tectonic boundaries
- Plate movement and motion



### 2. **Creating an ArcGIS Online map to explore Australia's Interstate Migration.**

This ArcGIS Online map was designed to support the second Year 8 unit: 'Changing Nations'. The lesson plan touches on subjects like push and pull factors, net interstate migration and interstate migration data. Feature layers included are:

- Internal migration data for each state
- Net interstate migration data



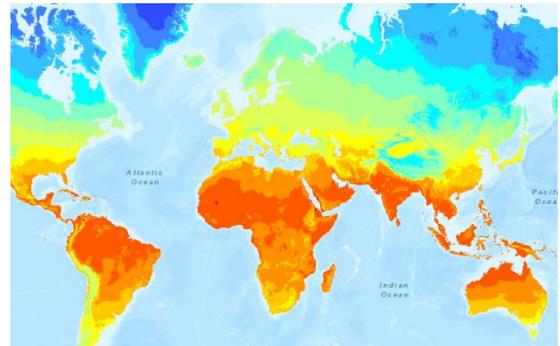
## Year 9 Geography

There are two units of study in the Year 9 curriculum for Geography: 'Biomes and food security' and 'Geographies of interconnections.' When using spatial technologies, such as ArcGIS Online, to support the delivery of these units, consider which of the three applications outlined earlier would best suit the content or assessment you are planning to deliver.

Here are two ways we have used GIS applications to help deliver content:

### 1. Using an ArcGIS Online Map to explore [Biomes and climate graphs](#).

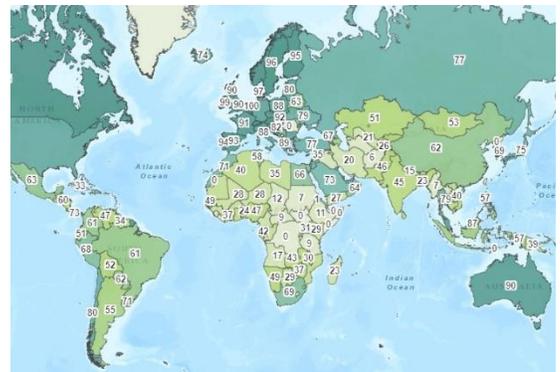
In this learning material, students look at how annual temperature and annual precipitation patterns are distributed spatially and how these patterns create different biomes. The learning activity also includes climate graphs and requires students to map the climate graphs to the appropriate geographical locations on our ArcGIS Online map.



### 2. Using an ArcGIS Online Map to explore [Globalisation](#).

This map explores globalisation through political, social, economic and religious means. For example, travel, trade and technology data is looked at by country, to determine each country's globalisation status. Some feature layers include:

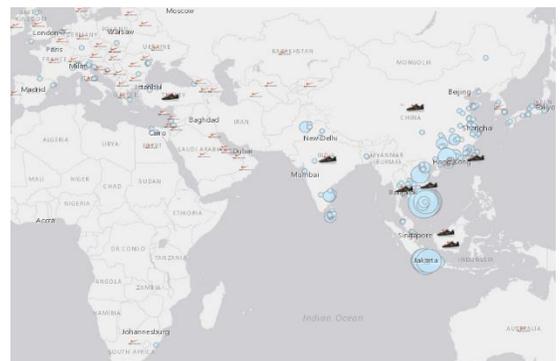
- Index of globalisation by country
- Internet use per 100 people
- Flight and shipping routes



Here is one way you could use GIS applications for assessment:

### 1. Creating an ArcGIS Online Map, as part of a research assignment, to analyse a product or company in a [case study \(e.g. Nike\)](#).

After performing research on Nike, we created an ArcGIS Online map, which includes feature layers that explore Nike's stores in each country, where different parts of a shoe are produced, where Nike's factory workers are distributed globally, textile pay rates per country, and child labour in the textile industry. A map like this could supplement the written components of a task by aiding in discussions surrounding analysis and interpretation.



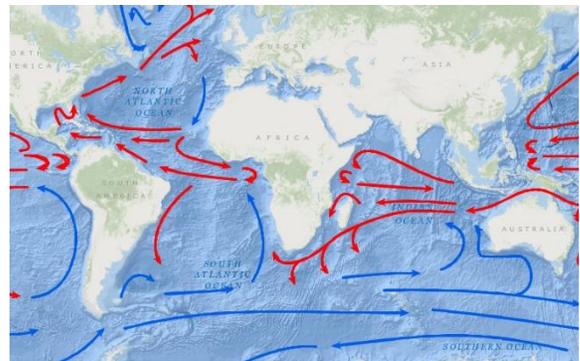
## Year 10 Geography

There are two units of study in the Year 10 curriculum for Geography: 'Environmental change and management' and 'Geographies of human wellbeing.' When using spatial technologies, such as ArcGIS Online, to support the delivery of these units, consider which of the three applications outlined earlier would best suit the content or assessment you are planning to deliver.

Here are two ways we have used GIS applications to help deliver content:

### 1. Using ArcGIS Online to explore the [effects of plastic on Earth's water systems](#).

In this lesson, we use ArcGIS Online mapping to explore how plastics – that often begin in households – end up in Earth's rivers, seas and oceans. This map uses feature layers like ocean currents, mismanaged waste data and river waste data to explain the plastic patches that exist in Earth's oceans.



### 2. Exploring human wellbeing by analysing the relationship between education and development

This learning material explores the relationship between education and birth rates to identify patterns that influence developments in the workforce. By analysing the relationship between adult literacy rates and fertility rates, key patterns emerge in developed and developing countries.



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## Next Steps:

### *Request a free ArcGIS Online Account for your school:*

Australian schools can request a free ArcGIS Online account as part of Esri Australia's Classroom GIS Initiative. A school subscription provides additional map layers, content, features and privacy. Learn more about ArcGIS Online, and apply for your ArcGIS Online School subscription at <http://esriaustralia.com.au/education>

### *Speak to Esri Australia's Education Program Manager:*

Australian schools can seek additional support or speak to our Education Program Manager by emailing [education@esriaustralia.com.au](mailto:education@esriaustralia.com.au).