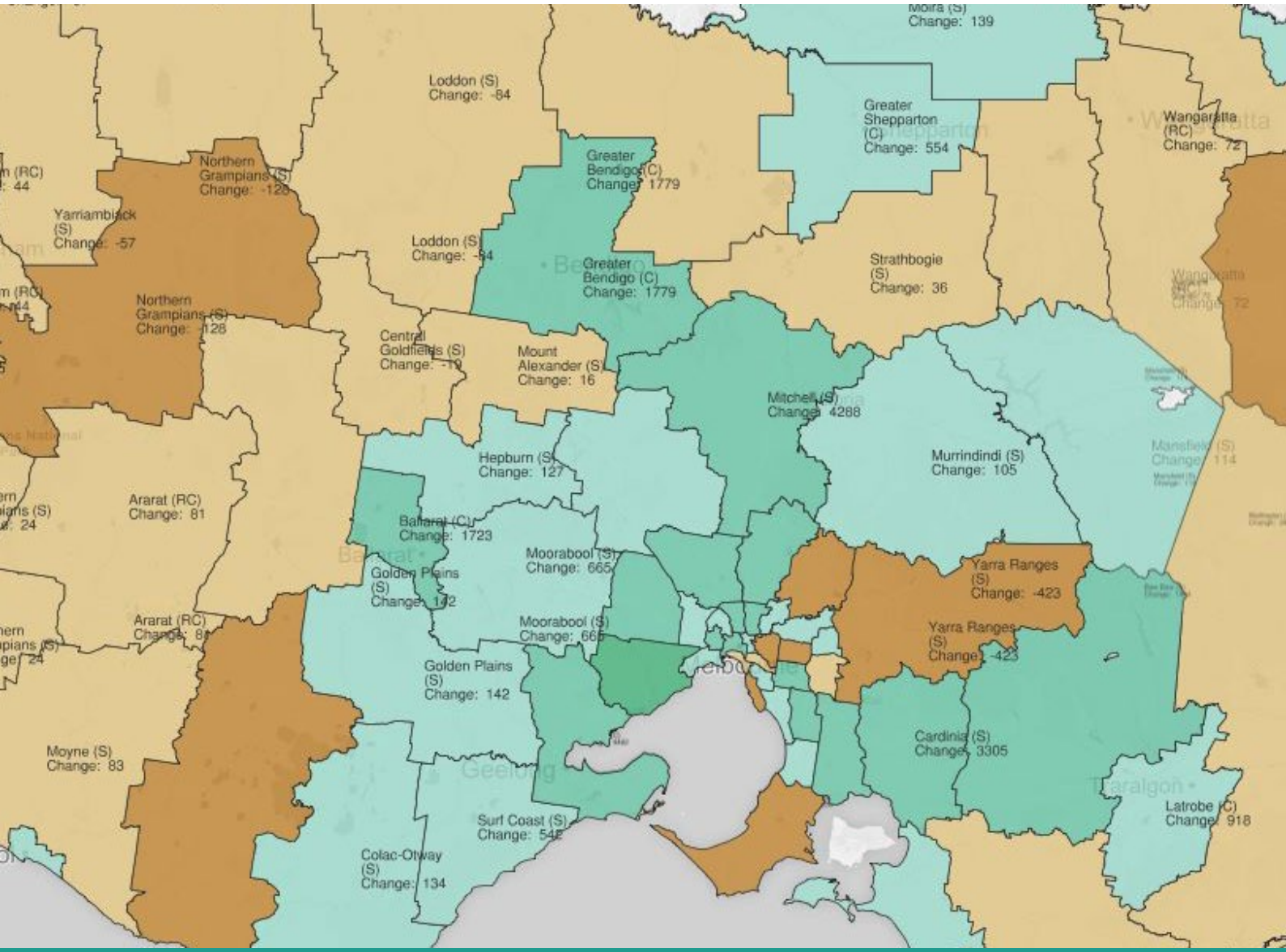
SPATIAL CONNECT

An activity based project



Sport and Recreation Spatial

LEVEL 9/10

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SPATIAL CONNECT

Sport and Recreation Spatial

Level

Level 9: Geographies of interconnection

Level 10: Geographies of human wellbeing

This activity is appropriate for both levels and topics. The interconnections investigated link with sport participation not only link into the Level 9 *Geographies of interconnections* unit, but by comparing with socio economic and wellbeing data it addresses many criteria of the Level 10 *Geographies of human wellbeing.* This activity would work perfectly as a linking task towards the end of Year 9 prior to Level 10 content.

Aim/s

- to investigate the factors affecting the rates of sport participation in Victoria
- manipulate data layers on maps to a variety of scales
- interpret data in various graphical forms
- identify various interconnections between sport participation and wellbeing
- produce Scatter graphs to look at correlations between geographical factors.

The following questions will be based on this aim:

- To what extent are the number of sports facilities interconnected to the level of participation?
- Which age groups/genres have the highest and lowest participation rates?
- Where future investment in Victoria is most needed?

Lessons required

3–5 lessons

This may vary in terms of number of extension activities completed and level of groups.

Curriculum links

Victorian Curriculum Geography Content Description [Australian Curriculum equivalent]
Geographical knowledge
The effects of people's travel, recreational, cultural or leisure choices on places, and the implications for the future of these places (VCGGK143) [ACHGK069]
Different ways of measuring and mapping human wellbeing and development, and how these can be applied to measure differences between places [ACHGK076]
Reasons for, and consequences of, spatial variations in human wellbeing in Australia at the local scale [ACHGK080]
Geographical concepts and skills
Identify, analyse and explain significant spatial distributions and patterns and identify and evaluate their implications, over time and at different scales (VCGGC128) Represent spatial distribution of geographical phenomena by constructing special purpose maps that conform to cartographic conventions, using spatial technologies as appropriate [ACHGS066]
Predict changes in the characteristics of places over time and identify the possible implications of change for the future (VCGGC127)
Identify, analyse and explain significant interconnections within places and between places over time and at different scales, and evaluate the resulting changes and further consequences. (VCGGC129)
Select, organise and represent data and information in different forms, including by constructing special purpose maps that conform to cartographic conventions, using digital and spatial technologies as appropriate (VCGGC131) [ACHGS069]
Analyse and evaluate data, maps and other geographical information using digital and spatial technologies and Geographical Information Systems as appropriate, to develop identifications, descriptions, explanations and conclusions that use geographical terminology (VCGGC132) [ACHGS067]

Level 9: Geographies of Interconnections

Effects of people's travel, recreational, cultural or leisure choices on places, and the implications for the future of these places

- looking for interconnections between the choice people make when completing exercise and the implications this has on facilities.

Year 10: Geographies of Human Wellbeing

Different ways of measuring and mapping human wellbeing and development, and how these can be applied to measure differences between places

- using GIS to compare economic variations between regions of Melbourne and applying to measure differences in activity levels

Issues affecting the development of places and their impact on human wellbeing

- how the variations in development within the state of Victoria may impact the level of sport participation

Different ways of measuring and mapping human wellbeing and development, and how these can be applied to measure differences between places

- use of **aurin.org** to map the levels of obesity and compare with the sport activity levels in these regions.

Background information and curriculum context

Sport and Recreation Spatial is a collaborative venture between Federation University and Victoria University. It integrates data about sport and recreation participation, sport and recreation facilities, population demographics and population health from multiple data sources.

Sport and Recreation Spatial provides a strong evidence base, and an increased capacity for, research, strategic planning, and development of participation programs and facilities. This is achieved through:

- a national Geographic Information System (GIS) for presenting spatial data relevant to all levels of the sport and recreation industry
- an associated research program which can address questions of national and international significance.

Hypothesis formation

Aim: To investigate the factors affecting the rates of sport participation in Victoria.

- To what extent are the number of sports facilities interconnected to the level of participation?
- Which age groups/genres have the highest and lowest participation rates?
- Where future investment in Victoria is most needed?

Students choose from the following hypotheses:

1. The level of participation in sport is strongly connected to the number of sports facilities available.
2. The level of participation is strongly connected to the socioeconomic characteristics of a region.
3. The level of sport participation is connected to multiple factors making it difficult to plan for or predict.

OR

Students write their own hypothesis

To what extent is sport participation interconnected to location?

Introduction

Go to http://www.sportandrecreationspatial.com.au/index.php or http://tinyurl.com/sportportal and watch the introduction video *Sport and recreation spatial documentary* and answer the following questions:

1. How does Rochelle Eime describe the activity level of Australians?
2. What two factors does Michael Cahill mention that is key to the study?
3. Why did Rayoni Nelson say that looking at individual age groups was important?
4. How can this project data and use of GIS help improve sport participation?
5. Why is regional sport said to be so important to the community?

Sport participation

The number of sport participants across Melbourne

1. Before you start your investigation . . .

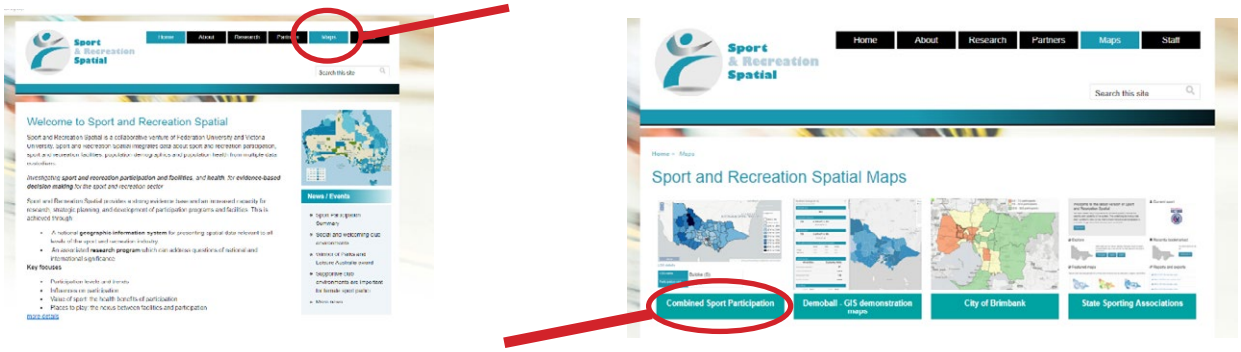
   a) Based on your experiences, predict how the level of sport participation might vary across Victoria? Which areas might have the highest participation? Which areas have lowest? Inner city? Outer suburbs? Regional?

   b) Justify any predictions made in 1a.

Website instructions

From the home page click on the maps icon in the top right corner of the page

- Select the first map *Combined sport participation*



This map combines the participation rates of 11 major sports in Melbourne and separates them into each of the Local Government Authorities (LGAs) of Victoria. The sports are listed below.

AFL Victoria (Australian Rules)	Gymnastics Victoria
Basketball Victoria	Hockey Victoria
Bowls Victoria	Netball Victoria
Cricket Victoria	Tennis Victoria
Football Federation Victoria (Soccer)	Yachting Victoria
Golf Victoria	

2. Describe the distribution of Sport Participation across Victoria using the PQE method (describe the general **Pattern**; **Quantify** by including data in your description; identify and record any **Exception** to the pattern).

   Pattern:

   Quantify:

   Exception:

3. How did your prediction in 1a compare to the pattern of sports participation you identified from the map?

4. Study the graph, figure 1, and complete the summary paragraph below using eight of the words/numbers from the word box.

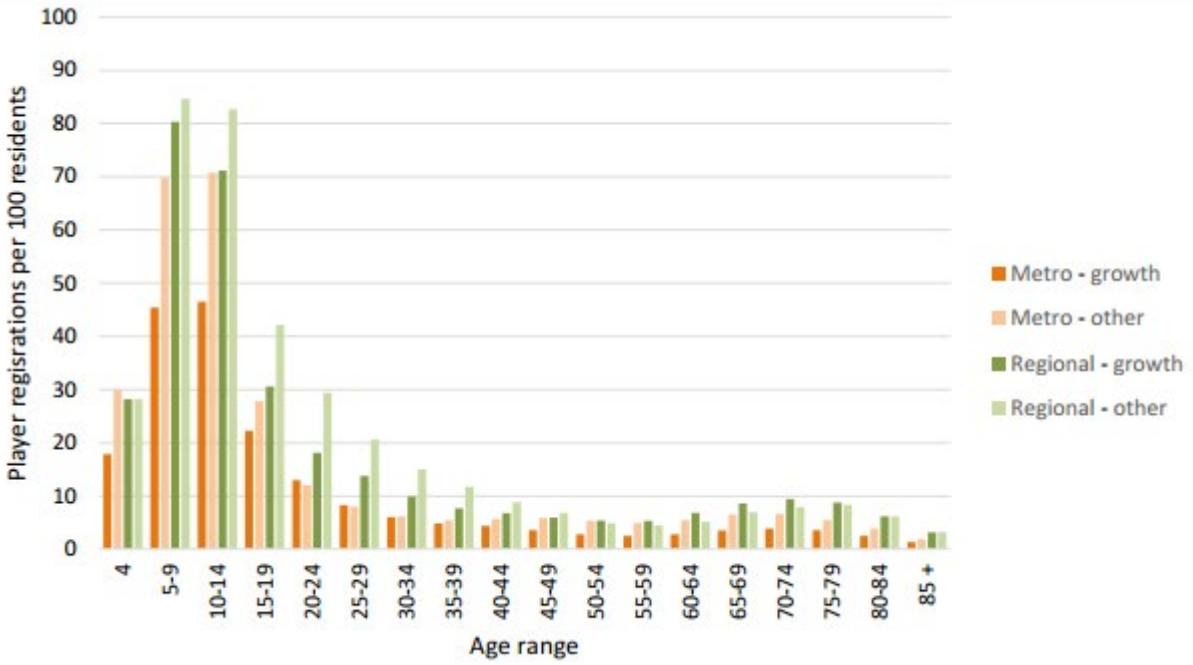


Figure 1: Age-specific participation rates, 2015, Victoria: by region

Word box

Higher
Metropolitan – Other
84.7%
Double
25–29
Regional – Other
5–14
Lower
82.7%
Quadruple

For most ages, participation rates were _____in regional areas than metropolitan areas. For the very young, (age 4), the highest participation rate of 29.9% was within the _____ region. For ages 5 to 49 years, the highest participation rates were within _____ areas. For ages 50–79 years, the highest participation rates were in Regional – Growth areas. The highest participation rate recorded was _____ for 5–10 year olds, followed closely by 10–14 year olds (_____%) within Regional – Other areas. The largest differences in participation rates by region were within the_____– _____years, with Regional – Other having almost _____ the participation rates of Metropolitan – Growth areas (80+% vs around 45%). While the participation rates beyond age 19 were much _____, the relative difference across regions was similar, with the highest rate being around double the lowest rate in all age groups.

Looking for socio-economic links

What might be some of the reasons for low sports participation? Does where you live and your income contribute to low or high sports participation?

To investigate answers to these questions you will be looking for any spatial patterns between sport and recreational activity and socio economic disadvantage.

- Go to the Demoball-GIS demonstration maps:
- Click on 'Map Gallery' and 'Participation rate per LGA in 2015'

Your map will now show the level of recreation by Victorian LGA. By hovering the mouse over the map and clicking on an LGA, sport participation rates for that region are displayed, including the following criteria:

- frequency of participation by region population
- the number of participants per sporting facility

1. a) Choose four LGAs, including two in Melbourne, and two in regional Victoria. Describe (using PQE: see Activity 2, question 2) the pattern of physical activity between regional and metropolitan Melbourne examining:
   - the percentage of participation rates
   - the number of facilities and playing fields.

   How does each of these factors change across the different regions within Victoria?

   Describe the distribution of frequency and duration of sport participation across Victoria using the PQE method.

   Pattern:

   Quantify:

   Exception:

   b) How does the pattern of the level of activity from this map differ from the description of your participation map in Activity 2?

   c) Can you think of any reasons for the differences?

- Now, click on the Overlays option. Select the *Socio-economic indexes for areas (SEIFA) 2011*, and select the *Index of Relative Socio-Economic Disadvantage (IRSD)*.
- In the bottom right corner of your screen there is a Legend for this map representing a scale of 1 (most disadvantaged) to 10 (least disadvantaged).
- By clicking on the 'hide overlay' and 'show overlay' icon in the top right of the screen, you can toggle between this map and sport participation map, specifying particular regions by clicking on an LGA.

Spatial association

Spatial association is the degree to which two or more phenomena share a similar *distribution* or arrangement on the Earth's surface. When describing *spatial association*, we write sentences such as "there is a strong, medium or weak degree of spatial association between...". Sometimes there is no association at all. Geographers will often try to determine the potential reasons for these links. However, you do not have to include this in your discussion unless asked.

How to describe spatial association in Geography

State the degree of spatial association (strong, moderate, weak, high medium, low).

e.g. "There is a strong degree of spatial association between . . ."

Use data to provide quantification/evidence. Quote specific countries, regions, places on maps and their values from the legend. This should be the bulk of your answer. Quote both high and low examples.

State any exceptions. If your association is only moderate then you will have lots of exceptions. Even if there is a strong association there still might be one exception which doesn't match the general pattern.

2. Describe the distribution of socio economic advantage/disadvantage across Victoria using the PQE (Pattern Quantify Exception) method (see Activity 2, question 2).

   Pattern:

   Quantify:

   Exception:

By toggling between the two maps, using the 'hide overlay' and 'show overlay' buttons, look for any spatial association between the two factors.

3. a) Identify an LGA region in Victoria that has a **high** participation rate and a "Most Disadvantaged" Socio Economic Value?

   b) Identify an LGA in Victoria that has a **low** participation rate and a "Least Disadvantaged" Socio Economic Value?

   c) Identify an LGA in Victoria that have a **high** participation rate and a "Least Disadvantaged" Socio Economic Value?

   d) Which LGA, in Victor, has **low** participation rate and a "Most disadvantaged" Socio Economic Value?

4. Summarise the degree of spatial association between socio economic disadvantage and sport participation in Victoria? Refer to specific regions and areas.

Looking for links – sport facilities

The aim of this activity is to investigate if there are any links between the level of sport participation and the number of sport venues. This is a very important pattern as it could potentially determine where funding is directed to increase the number of people participating in sport.

- Open the map at https://www.sportandrecreationspatial.com.au/member/demo_map.php
- Click on 'Data options'; click 'map type' and select 'region facilities'. Load the map.

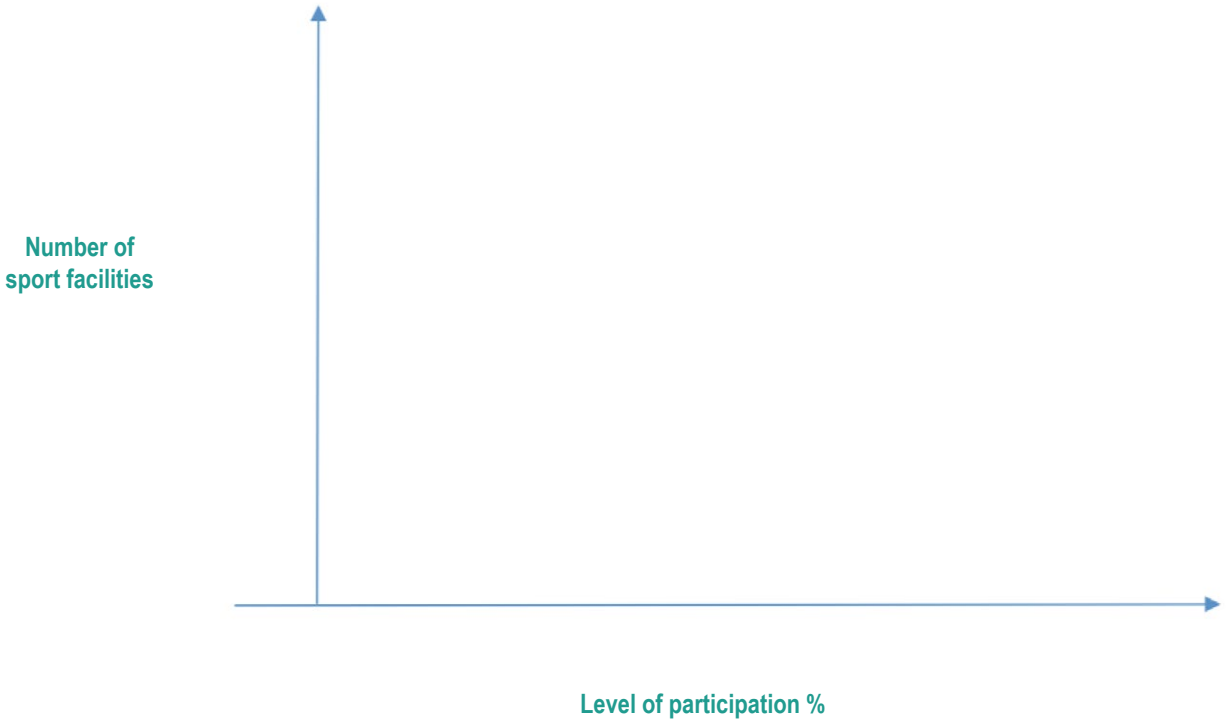
This base map shows recreation and sports facilities across the state, by LGA. You have to zoom in quite close to see them and click on an LGA you are interested in.

Choose 10 LGA areas with a participation level from each of the 10 colours in the Legend, (% participation).

1. Zoom in to each of these regions and count how many sports facilities are in each zone to complete the table below.

Region	% Participation	Number of sport facilities
	0–10	
	10–20	
	20–30	
	30–40	
	40–50	
	50–60	
	60–70	
	70–80	
	80–90	
	90–100	

2. Plot the points on the scatter graph to look for any correlation between the two factors. (If you need to, watch this video which shows how to draw a scatter graph: https://www.youtube.com/watch?v=HGV5xibEfv0)



3. Is there any correlation between the level of participation and the number of facilities?

Extension

Add more regions to your scatter graph. The more data added, the more valid the analysis.

Region	% Participation	Number of sport facilities
	0–10	
	10–20	
	20–30	
	30–40	
	40–50	
	50–60	
	60–70	
	70–80	
	80–90	
	90–100	

4. Has the correlation pattern changed at all with the extra regions plotted?

5. Have the results/patterns you have highlighted surprised you? What did you expect to find?

How does sport participation change with age?

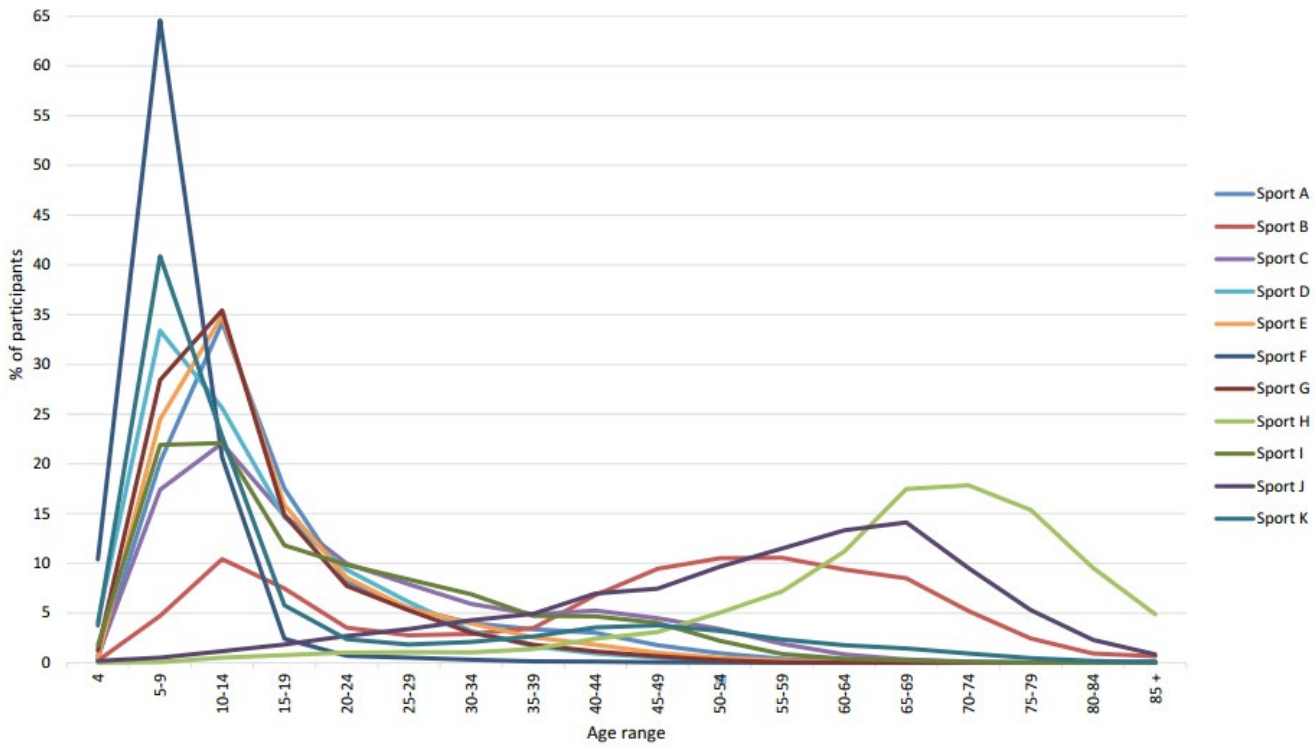


Figure 2: Age profile of registered players: by sport, 2015, Victoria

1. Refer to the graph.

   a) Describe the trends shown in sport participation throughout Victoria.

   b) The sports in the graph have not been labelled. Try to match the sports with the letters in the graph and record them in the table below. You may want to consider the following – high impact, popularity, intensity of sport, media coverage.

Sport	Letter	Reason
Australian Football		
Netball		
Hockey		
Bowls		
Sailing		
Cricket		
Gymnastic		
Football		
Tennis		
Golf		
Basketball		

If you are interested in comparing your results in this last activity with participation rates across Australia go to the ABS site:
http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4177.02013-14?OpenDocument
which presents an overview of sports participation by age, gender and activity type

2. What reasons might there be for the changes in sport activity identified? Look at the following factors and offer ways in which these might contribute to the change.
   e.g. Economic – people retire at a certain age? Increase leisure time?
   Social
   f.**H**istorical
   Environmental
   Economic
   Political
   Technological

Planning for the future

The aim of this activity is to look at the areas where population growth is highest and investigate where there might be a potential need for future investment in sport facilities.

- Open the map: https://www.sportandrecreationspatial.com.au/member/demo_map.php
- Click on Overlays
- Click on Victoria in Future: Population Projections
- Click on 2011–2031.
- Set the projection start year at 2016 and the projection end year to 2031

With this map layer you will be able to look at the local government areas with the highest percentage age of population growth.

Start by zooming right out to look at Victoria as a whole state.

1. Describe the predicted change of population across Victoria (use the PQE method again).

   Pattern:

   Quantify:

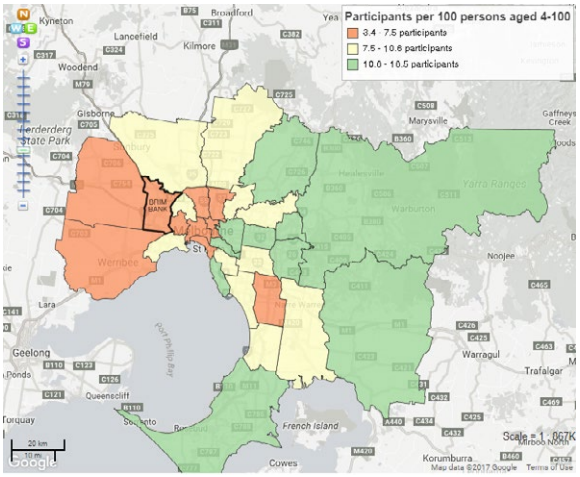
   Exception:

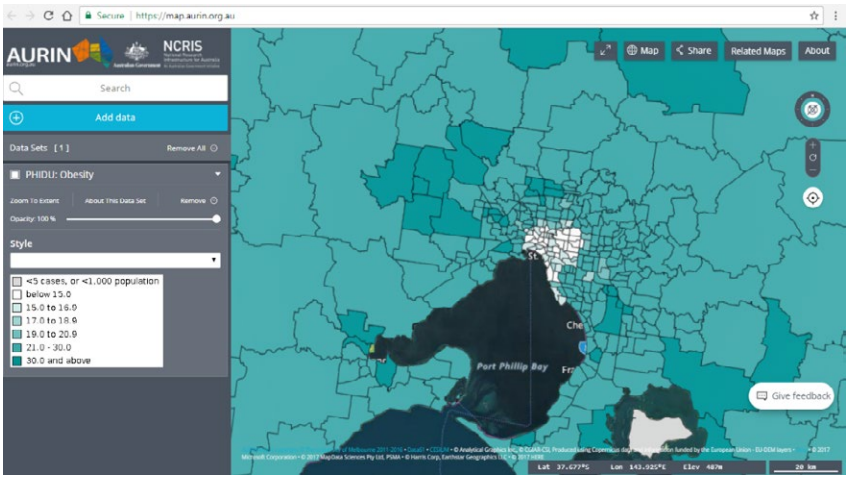
You can now move between the two layers of *Population Growth* and *Sport Participation* by toggling between Hide/ Show overlay

2. Which areas of Victoria do you think is most in need of investment in sports facilities? Provide reasons for your answer.
3. Look back at your original hypothesis. Has your research supported or dis proven your original hypothesis?
4. What do you think are the most important factors that influence sport participation in Victoria?

5. Think about the LGA in which you live. How do you think the government could best increase the levels of sport activity in your area? Refer to your investigation and maps as evidence.
   - investment in the local economy
   - increase sporting facilities
   - promotion of club membership.
6. Do the regions with highest levels of obesity also have the lowest levels of sport participation? (look at activity 3)
   - Select the three regions with the lowest sporting participation.
   - Follow the steps below (using the AURIN website) and see if they have high or low levels of obesity.

     Follow the steps below to look at the areas of highest and lowest obesity.
     - Open the AURIN website
     - Click *ADD DATA*
     - Click on *PHIDU OBESTIY*
     - Click *ADD TO MAP*
   - Zoom into Melbourne.
   - You may need to increase *Opacity* to see clearer pattern and the regions names on the AURIN map
7. Write a summary of your findings based on these map comparisons.





Extension Activity

A. Article analysis: international comparison

Aim: to appreciate the challenges of maintaining sport participation after heavy investment in facilities.

Go to this site and look at the photographs showing the Rio Olympics facilities of six months after the games were held.

1. Describe the facilities of Rio Olympics from the Guardian article. Annotate at least three photos.
2. Open Google maps and look at the various street views of the Olympic Park. Look for the blue dots on the street view to get a 360 degree photo.
3. Take a screen shot of three of these (look at the dates of the photo. Look for photos pre-September 2016 when the Olympic Games were held).
4. What changes have taken place?

This activity can lead into a discussion about having the infrastructure an interest to keep the venues running after the games.

B. The Rio Olympics: one year on

“A country in political meltdown and economic retreat, a city and state in financial turmoil and facing a public security crisis, organisers with unpaid debts and struggling to fulfil their lofty legacy promises. One year on from the Rio 2016 Olympic and Paralympic Games, how did it come to this?”

Use these articles to investigate the use of the Rio Olympics facilities after one year.

http://www.sportspromedia.com/magazine_features/the-rio-olympics-one-year-on

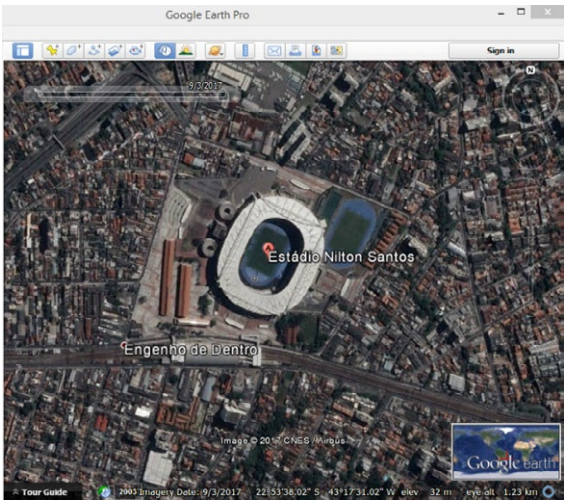
https://www.olympic.org/news/how-do-we-know-that-rio-2016-was-a-success

Students can work in small groups to report back on:

- financial turmoil
- political and economic instability
- white elephants.

1. What are the main problems for maintaining these facilities and using them for sport participation?
2. Why has the huge investment in facilities not been sustained after the event?

C 2004–2017 satellite imagery comparison



1. Open Google Earth Pro
2. Search Rio Olympic Park
3. Move the time Lapse Function  to note the change in land use.
4. Look at street view to see the level of development and prosperity there is in the area such as graffitti, public transport, public foot paths etc.
5. How might the surrounding area affect the level of use and maintenance of the facilities?