

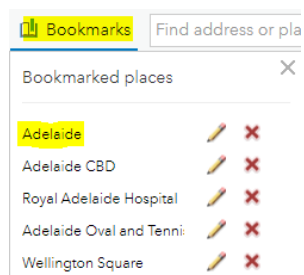
# Perimeter and area: squares, rectangles, triangles

Lesson Map: <http://esriaustralia.com.au/education/SpatialActivity80>

## Engage

### Finding the perimeter and area of a square

- Click on the map URL above to open the lesson map. Satellite imagery of Australia is displayed. Under the 'Bookmarks' tab, select *Adelaide*. The map extent will focus on the greater city of Adelaide.



- Go to the 'Bookmarks' tab again and select *Adelaide CBD*. The map extent will focus on Adelaide's Central Business District (CBD).
- Go to the 'Bookmarks' tab once more and select *Royal Adelaide Hospital*. The map extent will focus on the Royal Adelaide Hospital.
- Locate the hospital's helipad, which is marked by a large cross and 'H'. Zoom in on the helipad so that you can clearly see the four corners and sides of the helipad. It is clear that designated landing zone of the helipad is a square, which is marked by white paint on four sides.
- ? What are the formulas for finding the perimeter and area of a square? Record both answers below this question or in your subject book. [*Perimeter =  $S \times 4$ ; Area =  $S \times S$  or  $S^2$* ]

Download student worksheet [here](#).

Time  
30 minutes

### Activity

Investigate the perimeter and area of squares, rectangles and triangles.

### Learning Outcome

Students will be able to:

- Find the perimeter and area of squares
- Find the perimeter and area of rectangles
- Find the perimeter and area of triangles
- Engage with ICTs and locate shapes for measurement in Australian cities

### ACARA Curriculum Link

[Year 5 Mathematics: Geometry and measurement](#)

[ACMMG108 | ACMMG109](#)

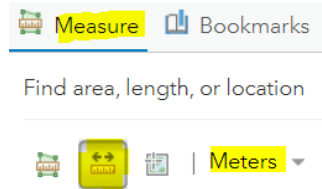
[Year 7 Mathematics: Geometry and measurement](#)

[ACMMG159](#)

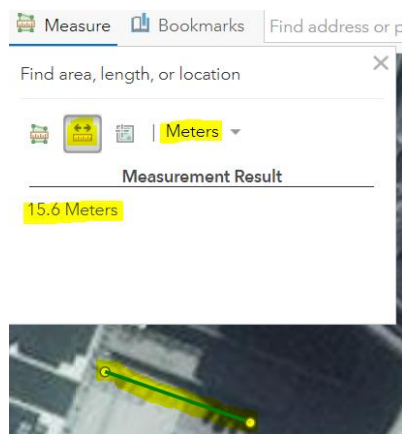
### Teacher Feedback:

To share your feedback on this, or any Spatial Activity, please contact [education@esriaustralia.com.au](mailto:education@esriaustralia.com.au)

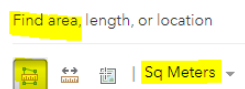
- Locate and click on the 'Measurement' tab. Click the 'Distance' icon and ensure that 'metres' is selected.



- To measure a length, click once on the first corner and then double-click on the next corner to lock in a measurement line.



- ? Find the perimeter of the hospital's helipad using the formula for finding a square's perimeter. Begin by measuring only one of the four sides of the square and completing the formula. Record the answer below this task or in your subject book.  
[One side's measurement is approximately 27 metres, depending on the accuracy of the student's measurement.  $P = 27m \times 4$ .  $P = 108m$ ]
- ? Now that you have the length of each side of the helipad, find the area of the helipad using the formula for finding the area of a square. [ $A = 27m \times 27m$  or  $27m^2$ .  $A = 729m^2$ .]
- Students can check their work by using the 'area' measurement tool:



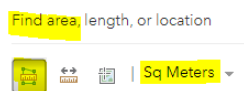
## Explore

### Finding the perimeter and area of rectangles

- Click the 'Bookmarks' tab and select *Adelaide Oval and Tennis center*. Adelaide Oval

hosts cricket matches. For now, zoom in on the tennis center.

- Locate the tennis show court, immediately north of the swimming pool.
- ? What are the formulas for finding the perimeter and area of a rectangle? [*Perimeter = 2 x (L+W); Area = L x W*]
- ? Find the perimeter of the entire playing court (blue area), by using the distance measurement tool to measure the length and width of the court. [*Perimeter = 2 x (19m + 35m). Perimeter = 108m. Note: answer may vary slightly depending on accuracy of student measurement*]
- ? Find the area of the entire playing court (blue area) **and** the area of the lined in-bound area by using the distance measurement tool. [*Area of entire playing court = L x W. Area of entire playing court = 35m x 19m. Area of entire playing court = 665m<sup>2</sup>. Area of in-bound area = L x W. Area of in-bound area = 24m x 11m. Area of in-bound area = 264m<sup>2</sup>. Note: answers will vary slightly depending on accuracy of student measurements.*]
- ? What is the total area of the blue court excluding the lined in-bound area? [*Area of entire court exc. Lined area = A<sup>1</sup> – A<sup>2</sup>. Area of entire court exc. Lined area = 665m<sup>2</sup> – 264m<sup>2</sup>. Area of entire court exc. Lined area = 401m<sup>2</sup>. Note: answers will vary slightly depending on accuracy of student measurements.*]
- Students can check their work by using the ‘area’ measurement tool:



## Explain

### Finding the perimeter of a triangle

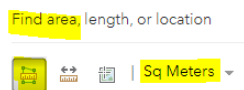
- Click the ‘Bookmarks’ tab and select *Wellington Square*. Wellington Square is a park in Adelaide.
- You should notice that the pathways in Wellington Square intersect to make a series of triangles. However, it is hard to see the full paths and the points at which corners intersect due to tree cover.
- To obtain a clearer view of the pathways, go to the ‘Basemap’ tab and change the basemap from *Imagery* to *Topographic*. You will now be able to clearly see that the paths intersect to create 4 triangles.

- ? What is the formula for finding the perimeter of a triangle [ $Perimeter = a + b + c.$ ]
- ? Using the measurement tool, find the perimeter of the top-right triangle. Zoom in to obtain a clearer picture of the triangle if necessary. Measure from the inside edge of each path. [ $Perimeter = 53.5m + 47m + 73.2m. Perimeter = 173.7m. Note: answers will vary slightly depending on accuracy of student measurements.$ ]
- ? Using the measurement tool, find the perimeter of bottom-left triangle. Zoom in to obtain a clearer picture of the triangle if necessary. Measure from the inside edge of each path. [ $Perimeter = 137.7m + 47.6m + 147.3m. Perimeter = 332.6m. Note: answers will vary slightly depending on accuracy of student measurements.$ ]

## Extend

### Finding the area of a triangle

- ? Record the formula for finding the area of a triangle. [ $A = H_b \times B \div 2.$ ]
- ? Combine the two smaller triangles to the north of the park into one larger triangle. Find the area of this larger triangle using the appropriate formula and the distance measurement tool. [ $Area = H_b \times B \div 2. Area = 49.2m \times 105m \div 2. Area = 5166m^2 \div 2. Area = 2583 m^2. Note: answers will vary slightly depending on accuracy of student measurements.$ ]
- ? Combine the two larger triangles to the south of the park into one larger triangle. Find the area of this larger triangle using the appropriate formula and the distance measurement tool. [ $Area = H_b \times B \div 2. Area = 140.7m \times 108.2m \div 2. Area = 15223.74m^2 \div 2. Area = 7611.87m^2. Note: answers will vary slightly depending on accuracy of student measurements.$ ]
- Students can check their work by using the 'area' measurement tool:



## 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>