*A problem-solving and modelling task suitable for students working with* ***area (Focus: composite shapes)***

**Modelling Northern Qld**

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**QCAA approach to problem solving and mathematical modelling**

(<https://www.qcaa.qld.edu.au/downloads/portal/syllabuses/snr_maths_methods_19_syll.pdf>)

**How big is the Tablelands Region?**

Australian curriculum content descriptors:

Year 9

Calculate areas of composite shapes (ACMMG216)

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**How big is the Tablelands Region?**

Modelling Northern Qld

1. Which of the following towns/regions do you think is smaller than the Tablelands Region?

* Townsville
* Mackay
* Cairns
* Brisbane
* Burdekin Shire
* Rockhampton
* Charters Towers Region
* Whitsundays Region
* Canberra

Research & Formulate

Brittany goes to the Tablelands Region every year for Christmas with her family. Her friend Jessie thought she meant the town, Atherton which she called Atherton Tablelands. However, the Tablelands region is made up of many smaller towns such as Julatten, Tinaroo and Walkamin. Because Jessie has never been to the Tablelands Region, Brittany is trying to explain how big it really is.



Reference:

Region Map -<https://www.communities.qld.gov.au/resources/corporate/regional-boundaries.pdf>

2. What combinations of 2D shapes could you use to ‘model’ or represent the general shape of the Tablelands? Choose shapes that cover the Tablelands as accurately as you can.

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1. What type of measurement would be the best to describe how big the Tablelands is?

Perimeter Area Volume

1. What formula will be useful in your calculations?

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1. What information do you need to be able to use the formula? Do you have it already or could you figure it out?

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1. The picture is a scaled diagram. How will you get the real size of the Tablelands? [Hint” It is usually easier to do your conversions before using any measurement formula.]

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1. Looking at the shapes you are using to calculate the size of the Tablelands, would you say that your calculations will be too big or too small? How can you tell?

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Now that you have a plan…

Solve

1. Using your answers from Q2-6, calculate the area of the Tablelands (approximately).

Evaluate & Verify

1. The actual area for the Tablelands Region is 64,999 km2. Compare this with your approximation of the area. How could you improve your approximation?

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1. Google the areas of the towns and regions from question 1. Compare these areas to the area of the Tablelands – are there any that you weren’t expecting? If so, what key factors influenced your decision making?
* Townsville \_\_\_\_\_\_\_
* Mackay \_\_\_\_\_\_\_
* Cairns \_\_\_\_\_\_\_
* Brisbane \_\_\_\_\_\_
* Burdekin Shire \_\_\_\_\_\_
* Rockhampton \_\_\_\_\_\_
* Charters Towers \_\_\_\_\_\_
* Whitsundays Region \_\_\_\_\_\_
* Canberra \_\_\_\_\_\_

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Communicate

1. If someone else was like Jessie and didn’t realise how big the Tablelands Region is, how would you explain it to them. Justify your answer using your calculations and your research of other areas in Australia.

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