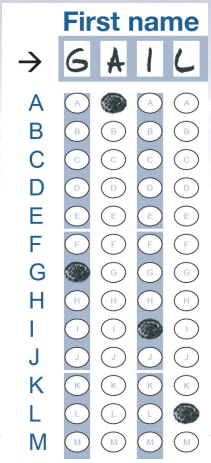
Question Booklet

2019 Australian Geography Competition

INSTRUCTIONS

1. Use a 2B pencil to complete the answer sheet. You will need a clean eraser to erase your mistakes.

   YOU MUST FILL IN THE REQUIRED OVALS. The answer sheet is computer marked and all the ovals you fill in are recorded. See the left side of the Answer sheet for instructions on how to fill in the ovals correctly.



2. **Before the start of the test**

   Fill in your name by writing the letters of your name in the required boxes. Then fill in the corresponding ovals beneath the letters of your name. See the **First name** example to the right. You must do this for both your **First name** and **Last name**.

   On the lower left of the Answer sheet, please print your school's name where asked. Write the numbers your teacher will give you in the **School Code** and **Postcode**.

   On the bottom of the Answer sheet, fill in the oval beside your **Year level**.

   If you are in **Year 11**, fill in the oval beside your **age at 30 June 2019**.

   Fill in the oval beside your **Gender**.

   If you need to, your teacher will advise you to fill in an oval under **School assigned**.

3. **Answer** each question by filling in only one oval that corresponds to the most appropriate answer choice for that question. If you change your mind, you must erase the wrong answer completely so that only one oval is filled in for each question.

   If you are in **Year 7 or younger**, or **Year 8** answer Questions 1–30.

   If you are in **Year 9** or **Year 10** answer Questions 1-40.

   If you are in **Year 11** or **Year 12** answer Questions 16-50 (starting on page 5).

4. Do not mark the front or back of the answer sheet in any other way as this can lead to errors in the computerised marking, or to you not getting a result.

5. You have **35 minutes** to answer the questions.

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Start at Question 1 if you are in **Year 10 or younger**. Start at Question 16 (on page 5) if you are in Year 11 or 12.

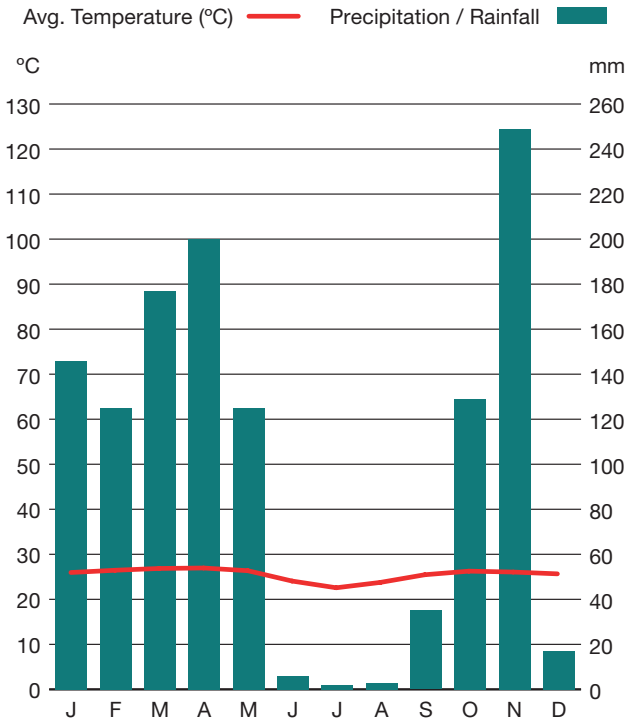


Figure 1. *Climate graph for Kinshasa, Democratic Republic of Congo - 4°19´S, 15°18´E*

Source: climate-data.org

1 From Figure 1, in which months does Kinshasa have the highest rainfall?

A April, May and November
B February, March and April
C January, March and April
D January, November, and December
E March, April and November

2 Using Figure 1, the driest months in Kinshasa occur during which season?

A autumn
B spring
C summer
D winter
E rainfall is equally distributed

3 Kinshasa's average temperature, as shown in Figure 1, is best described as:

A consistent temperatures across spring and autumn with sharp decline in winter
B constant average temperatures not falling below 28°C
C limited variation in average temperatures across the year
D minor variations in temperature, with the highest average in November
E temperature differences between summer and winter of more than 10°

4 Which type of biome is typical of a climate like Kinshasa's?

A desert
B savannah
C temperate woodland
D tropical rainforest
E tundra

Figure 2. *Kinshasa, Democratic Republic of the Congo*

Source: © FredR/flickr CC BY-NC-ND 2.0 International

5 The process shown in Figure 2 is best described as:

A counter urbanisation
B gentrification
C rural to urban migration
D urban renewal
E urban sprawl

6 People move to urban centres as a result of:

A availability of affordable housing
B better access to open space
C high population density in rural areas
D improved employment opportunities
E less polluted environment

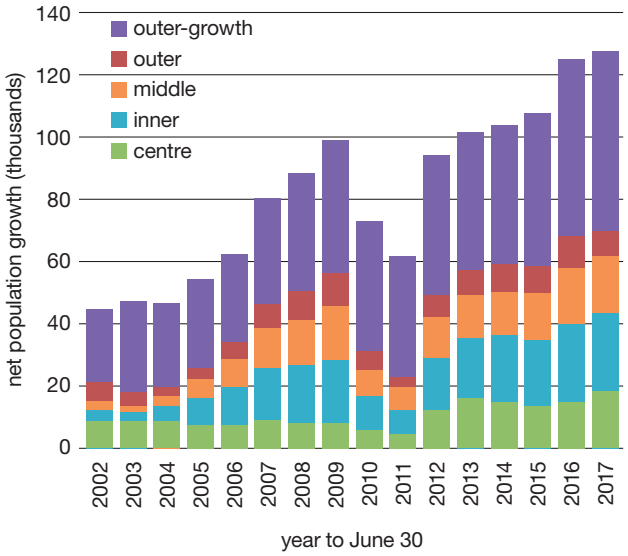


Figure 3. *Annual Melbourne population growth by region* *Source: Chris Loader, chartingtransport.com*

7 From Figure 3, what was Melbourne's approximate population growth in 2014/15?

A 101,000
B 108,000
C 116,000
D 128,000
E 140,000

8 Using Figure 3, what was the approximate total growth of Melbourne's middle suburbs from 2013/14 to 2016/17 inclusive?

A 19,000
B 36,000
C 49,000
D 68,000
E 221,000

9 The change in Melbourne's population growth rate from 2008/09 to 2009/10, as shown in Figure 3, reflected the Australia-wide change that was due to:

A a decline in net overseas migration
B a decrease in the death rate
C an increase in the birth rate
D a reduction in urban-rural migration
E a rise in interstate migration

10 Figure 3 is a:

A compound column graph
B cumulative line graph
C divergence column graph
D multiple bar chart
E multiple line graph

Figure 4. *Crops bordering Columbia River near Hermiston, Oregon, USA* *Source: Photo by (Doug Wilson), USDA Agricultural Research Service*

11 Using Figure 4, which type of climate does Hermiston have?

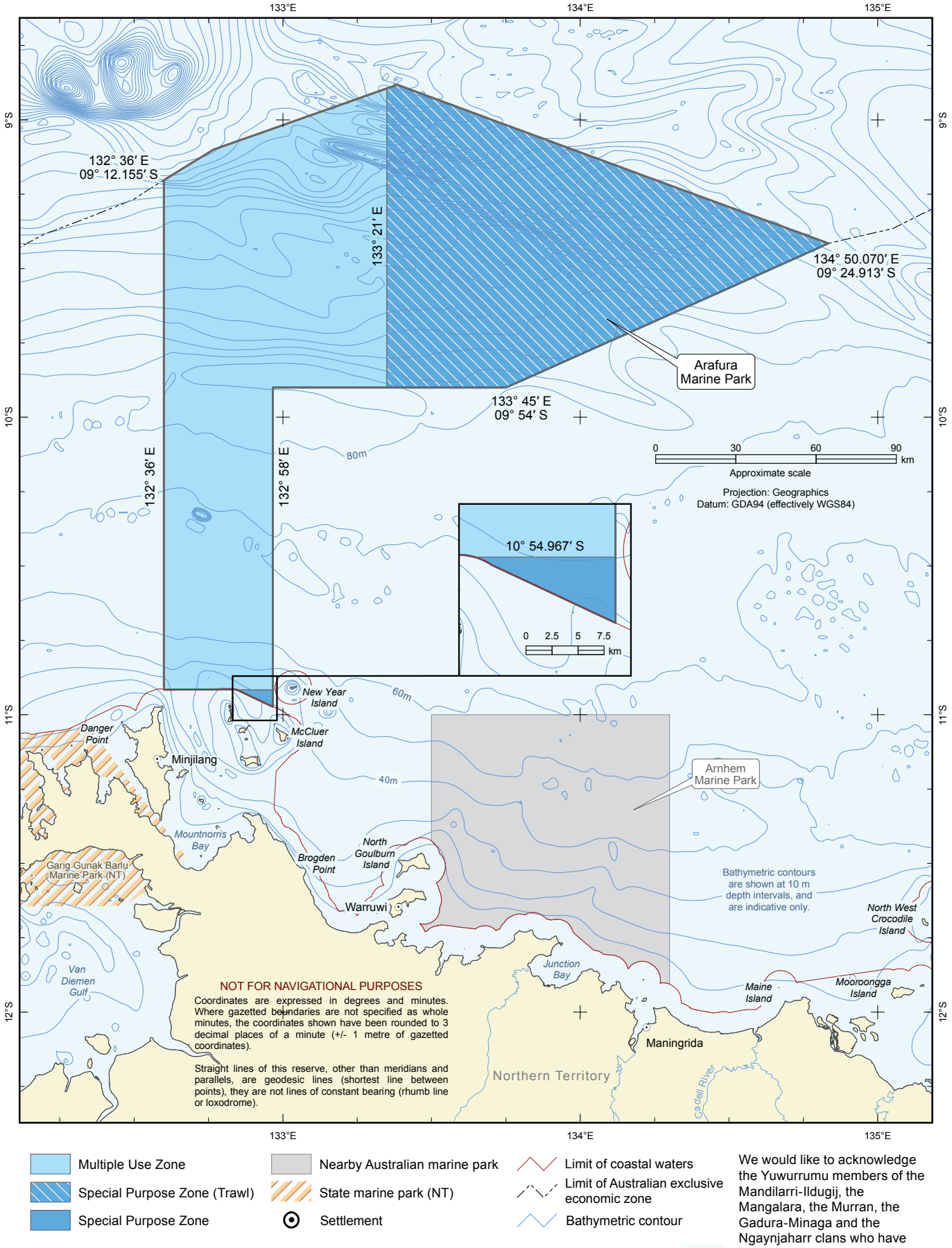
A semi-arid
B sub-tropical
C temperate
D equatorial
E Mediterranean

12 The circular pattern shown in Figure 4 is due to:

A competing rural and urban land uses
B the farmer using a circular plough
C the hilly topography and watercourses
D spacecraft making crop circles
E the type of irrigation system used

13 The image in Figure 4 shows:

A an alluvial plain
B clay pan
C a coastal plain
D a delta
E tidal flats



We would like to acknowledge the Yuwurrumu members of the Mandilarri-Ildugij, the Mangalara, the Murran, the Gadura-Minaga and the Ngaynjaharr clans who have responsibilities for sea country in this marine park.

Figure 5. *Arafura Marine Park*

parksaustralia.gov.au/marine. © Commonwealth of Australia, 2018

14 Look at the map in Figure 5. What do bathymetric contours show?

A ice boundaries
B mainland terrain
C sea currents
D sea temperatures
E seafloor relief

15 Using Figure 5, the northern boundary of the Arafura Marine Park is determined by the:

A 200 m bathymetric contour
B boundary of the NT State marine park
C extent of the Yuwurrumu sea country
D limit of Australian exclusive economic zone
E limit of coastal waters

Start at Question 16 if you are **in Year 11 or 12**. Other students continue answering questions.

16 From Figure 5, what is located at 10°54'S 133°02'E?

A McCluer Island
B Minjilang
C New Year Island
D North Goulburn Island
E Warruwi

17 Using Figure 5, what is the approximate length of the western boundary of Arafura Marine Park?

A 80 km
B 120 km
C 130 km
D 190 km
E 270 km

18 Using Figure 5, the depth of water at the northeast limit of Arnhem Marine Park is approximately:

A 5 m
B 50 m
C 55 m
D 60 m
E 65 m

Arafura Marine Park includes canyons that are remnants of an ancient drowned river system ... The canyons funnel deep, nutrient-rich ocean waters upward.

Figure 6. *Arafura's environment*

Source: © Australian Marine Parks, Arafura

19 See Figure 6. The drowned river system in Arafura Marine Park is the result of:

A flooding about 180 years ago
B sea level fall about 800 years ago
C sea level fall about 8,000 years ago
D sea level rise about 18 years ago
E sea level rise about 18,000 years ago

20 Based on Figure 6, the upward movement of water in the Arafura Marine Park canyons has led to:

A abundant marine life
B flooding of nearby islands
C frequent storm surges
D a high tidal range
E increased salinity levels at the surface

21 The canyons have high levels of endemism. This means that they are habitat for species that are:

A found only in a single region
B indigenous to Australia
C located only in deep water
D threatened with extinction
E widespread across the world

22 Hard engineering techniques to control coastal erosion can include:

A building sea walls along the shoreline
B nourishing beaches with imported sand
C relocating the coastal population
D replanting mangroves along eroded coasts
E restricting access to the shoreline

Figure 7. *Uluru at Sunset*

Source: © Bruno Menetrier, Public Domain

23 Uluru (Figure 7) is on the World Heritage List because:

A Aboriginals own the land, with the Australian government holding a 99-year lease

B it originally sat at the bottom of a sea, but today stands 348 m above ground

C of its spectacular geological formation and relationship with the indigenous Anangu

D the surface oxidation of its iron content gives Uluru a striking orange-red colour

E Uluru is an iconic photo stop for international tourists

24 Which type of landform is Uluru?

A hill

B inselberg

C peak

D plateau

E valley

> That's a really important sacred thing that you are climbing... You shouldn't climb. It's not the real thing about this place. And maybe that makes you a bit sad. But anyway that's what we have to say. We are obliged by Tjukurpa to say.
>
> And all the tourists will brighten up and say, 'Oh I see. This is the right way. This is the thing that's right. This is the proper way: no climbing.'

Figure 8. *Message from Kunmanara, traditional owner* *Source: Please don't climb Uluru,Parks Australia*

25 See Figure 8. According to the statement made by Kunmanara, visitors should not climb Uluru because:

A the climb is boring and not worth visitors' time

B the climb is difficult and dangerous, and could result in death

C it has spiritual significance to the traditional owners and the climb would be disrespectful

D it is expensive to maintain the track for visitors

E there are several more enjoyable activities to participate in within the National Park

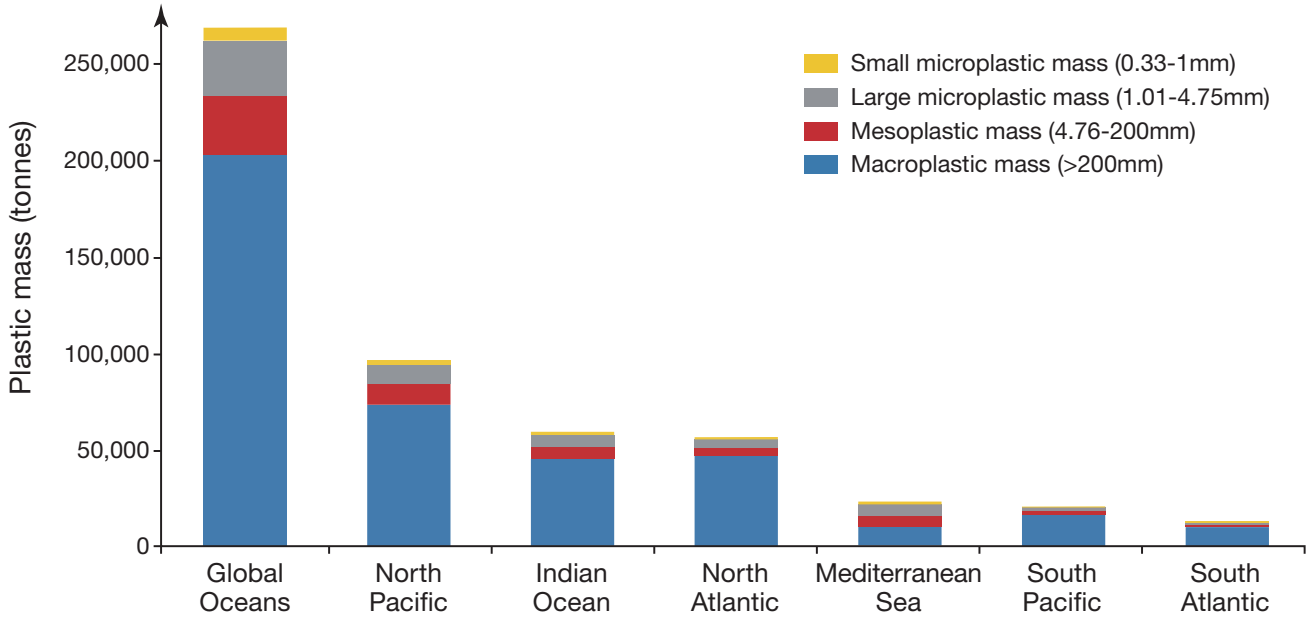


Figure 9. *Weight of plastic floating in the world's oceans, estimated from 24 survey expeditions (2007-2013)*

Source: Hannah Ritchie and Max Roser CC-BY-SA

26 From Figure 9, approximately how many tonnes of plastic were estimated to be floating on the world's oceans?

A 101,000
B 206,000
C 252,000
D 269,000
E 304,000

27 From Figure 9, which type of plastic contributed most to the weight of floating plastics?

A large microplastics
B macroplastics
C mesoplastics
D microplastics
E small microplastics

28 Using Figure 9, which ocean accounted for the highest weight of floating plastic?

A Atlantic
B Indian
C Mediterranean
D Pacific
E Southern Ocean

29 According to the World Economic Forum, by 2050 the plastic found in the ocean will outweigh fish. Which statement best aligns with the prediction?

A Fish species are not breeding at sustainable levels resulting in decreasing volumes of fish.
B Increasing demand for fish is causing more pollution of the oceans.
C Mismanagement of plastic waste and overfishing have reached unsustainable levels.
D Plastics are being produced and disposed of at a rate higher than the ocean can absorb.
E Plastic consumption is decreasing but is still causing the death of marine species.

Figure 10. *Plastic sushi ad* *Source: © Surfrider Foundation*

30 What does the ad in Figure 10 suggest about the impacts of the plastic found in the ocean?

A The commercial fishing industry is catching less fish due to higher volumes of plastics.
B Human demand for seafood is putting pressure on natural environments.
C Human health will be impacted by consuming marine life that has eaten plastics.
D An increasing number of marine species will be killed as a result of plastic in the oceans.
E The quality of some fish species will decline as a result of plastic waste in oceans.

If you are in **Year 8 or younger**, stop at Question 30. Other students continue answering questions.

31 Recycling is defined as a resource recovery method that involves:

A Collecting and processing waste and manufacturing new products.
B Collecting waste from households and sorting it.
C Manufacturing new products from sustainable sources.
D Recovering waste material and adding it to landfill.
E Sorting and re-processing waste and exporting it to developing countries.

Figure 11. *Satellite images of a neighbourhood in Palu, Sulawesi, Indonesia– left 7 April 2018, right 2 October 2018*
Source: © Digital Globe, 2018 CC BY-NC 4.0 International

32 Which impact of the Palu earthquake is best illustrated in Figure 11?

A coastal erosion
B damage to major infrastructure
C large number of injuries and deaths
D loss of biodiversity
E many people left homeless

33 Figure 11 best illustrates the concept of:

A change
B interconnection
C place
D scale
E space

34 Using Figures 12 and 13, what caused the tsunami that affected Palu?

A The east side of the fault was forced under the west side, displacing sea water.
B The two sides of the fault moved away from each other, causing an earthquake.
C The two sides of the fault slid past each other, resulting in an underwater landslide.
D The two tectonic plates collided, folding the bedrock.
E The vertical motion of the east plate over the west plate forced sea water up.

35 Which type of plate boundary is shown in Figures 12?

A collision
B convergent
C divergent
D subduction
E transform

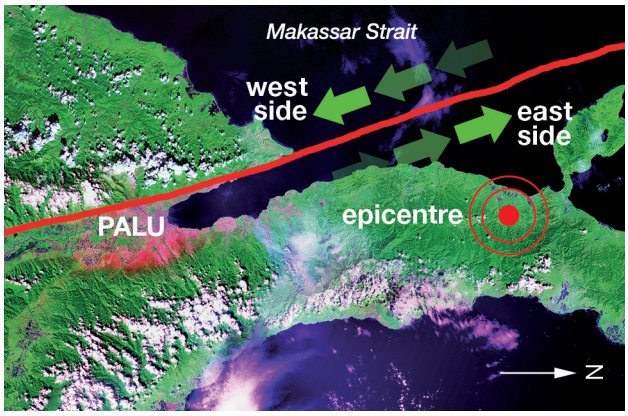


Figure 12. *Palu-Koro plate boundary fault, Sulawesi, Indonesia* *Source: © USGS, LANDSAT Mosaic and © Government of Republic of Indonesia, Public Domain*

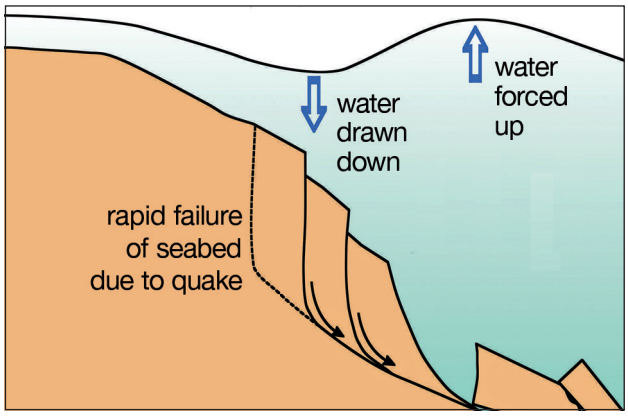


Figure 13. *Diagram of the cause of the Palu tsunami on 28 September 2018, Indonesia* *Source: © Brian Ricketts www.geological-digressions.com CC BY 4.0 International*

Table 1. *Top 10 world container ports, 2013 – 2016*

Source: World Shipping Council 2019

Rank	Port	Volume - Million shipping containers			
		2013	2014	2015	2016
1	Shanghai, China	33.62	35.29	36.54	37.13
2	Singapore	32.60	33.87	30.92	30.90
3	Shenzhen, China	23.28	24.03	24.20	23.97
4	Ningbo-Zhoushan, China	17.33	19.45	20.63	21.60
5	Busan, South Korea	17.69	18.65	19.45	19.85
6	Hong Kong, S.A.R., China	22.35	22.23	20.07	19.81
7	Guangzhou Harbor, China	15.31	16.16	17.22	18.85
8	Qingdao, China	15.52	16.62	17.47	18.01
9	Jebel Ali, Dubai, U.A.E.	13.64	15.25	15.60	15.73
10	Tianjin, China	13.01	14.05	14.11	14.49

36 Using Table 1, which region shipped the most containers in 2016?

A Central Asia
B East Asia
C Europe
D Middle East
E North America

37 Using Table 1, which port increased its shipping volume at the highest rate between 2013 and 2016?

A Busan
B Hong Kong
C Ningbo-Zhoushan
D Shanghai
E Shenzhen

38 Based on Figure 14, what is the most accurate description of India's population?

A accelerating growth rate with increasing family size
B contracting with small families
C rapidly expanding with large families
D slowing growth rate with decreasing family size
E stable with large families

Figure 14. *India's population profile, 2018*

Source: United States Census Bureau

39 Using Figure 14, approximately 50% of India's population is below the age of:

A 15
B 25
C 35
D 45
E 55

40 Given India's population and age structure (see Figure 14), which of these is among its most pressing challenges?

A creating sufficient new jobs for young people entering the workforce
B encouraging families to have more children
C a high age dependency ratio putting a strain on the economy
D a high infant mortality rate from preventable infectious diseases
E many orphans due to the HIV epidemic

If you are **in Year 9 or 10**, stop at Question 40. Year 11s and 12s continue answering questions on next page.

In 2018 Infrastructure Australia published a report, *Future Cities: Planning for our growing population*. It examined the need for our largest cities to effectively anticipate and respond to their substantial population growth. It analysed three hypothetical planning scenarios, together with the transport infrastructure needed to support them. The scenarios proposed the proportions of the additional population that would be located in greenfield or infill developments. Some of the material on Sydney is presented here.

Figure 15. *Future Cities: Planning for our growing population*

Expanded Low Density

- 30% low density greenfield/70% infill development, with a focus on minimising growth in existing areas
- Current economic geography of the city maintained
- Transport networks expanded to better connect population in outer suburbs

Centralised High Density

- 10% low density greenfield/90% infill development, with a focus on higher density in inner areas
- Dual CBD model – Parramatta and Sydney CBD
- Better use of existing transport infrastructure by developing around existing nodes in inner and middle suburbs

Rebalanced Medium Density

- 20% low density greenfield/80% infill development, with a focus on medium density across the city
- Decentralised employment structure across eight economic clusters
- New transport infrastructure to support new economic geography

Figure 16. *Hypothetical planning scenarios for Sydney*

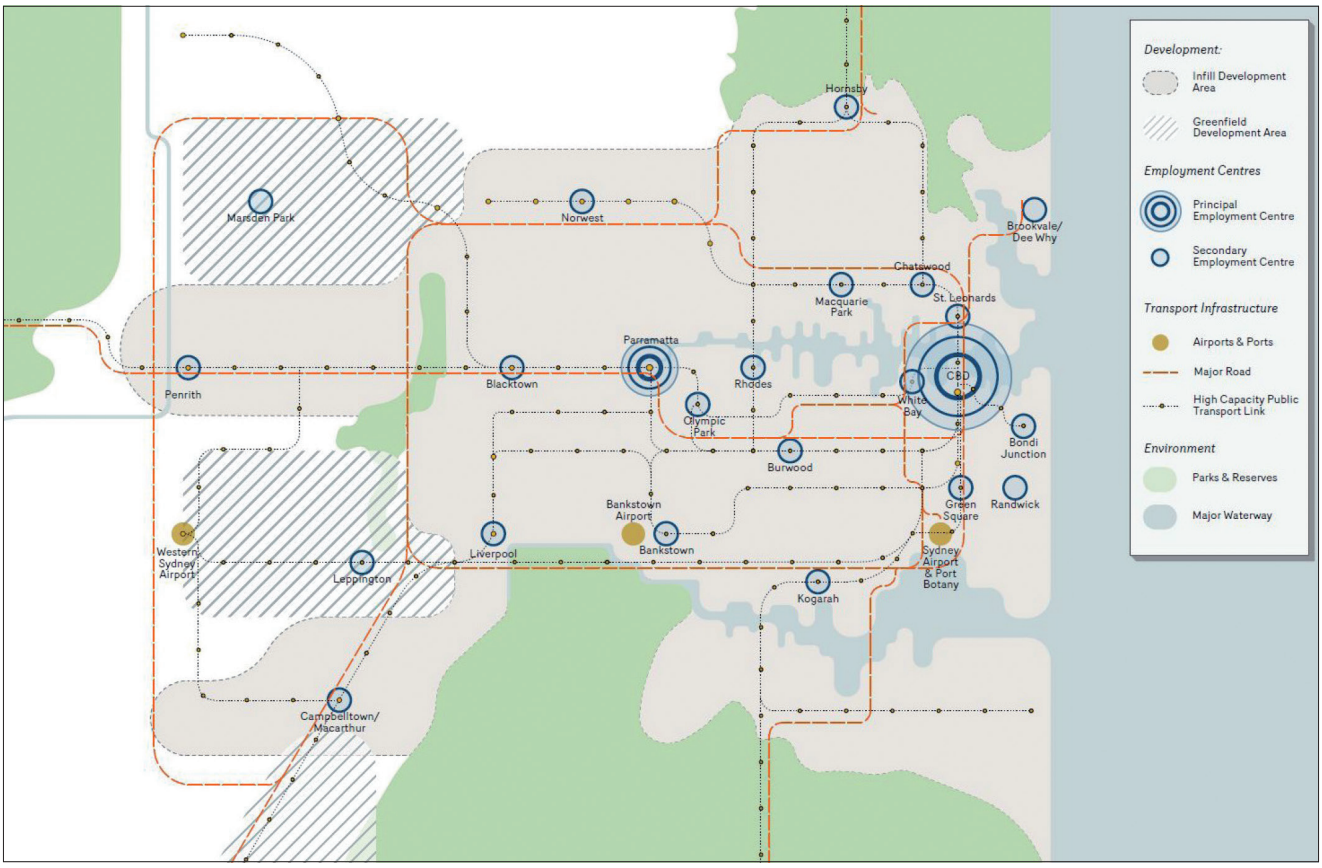


Figure 17. *Schematic of Expanded Low Density scenario, Sydney*

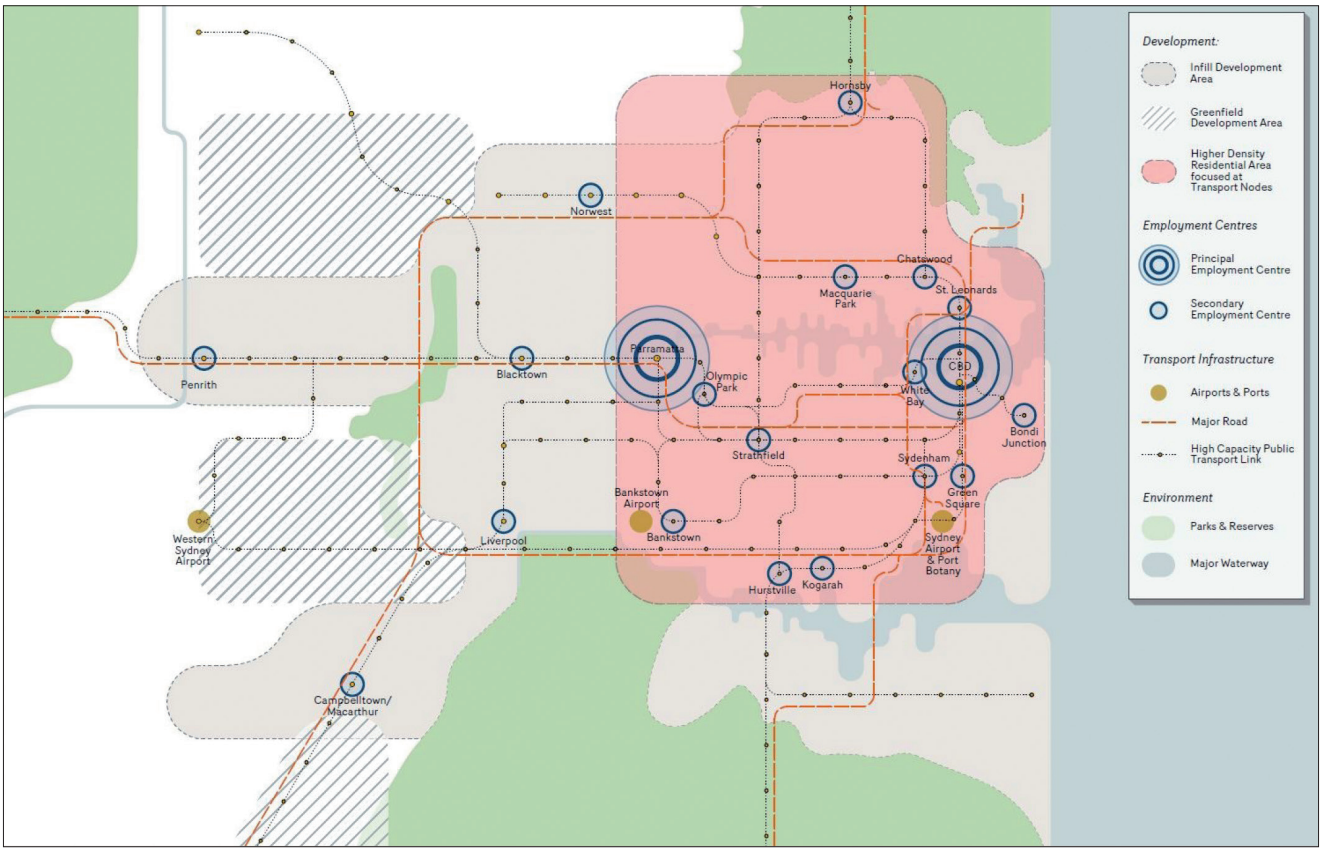


Figure 18. *Schematic of Centralised High Density scenario, Sydney*

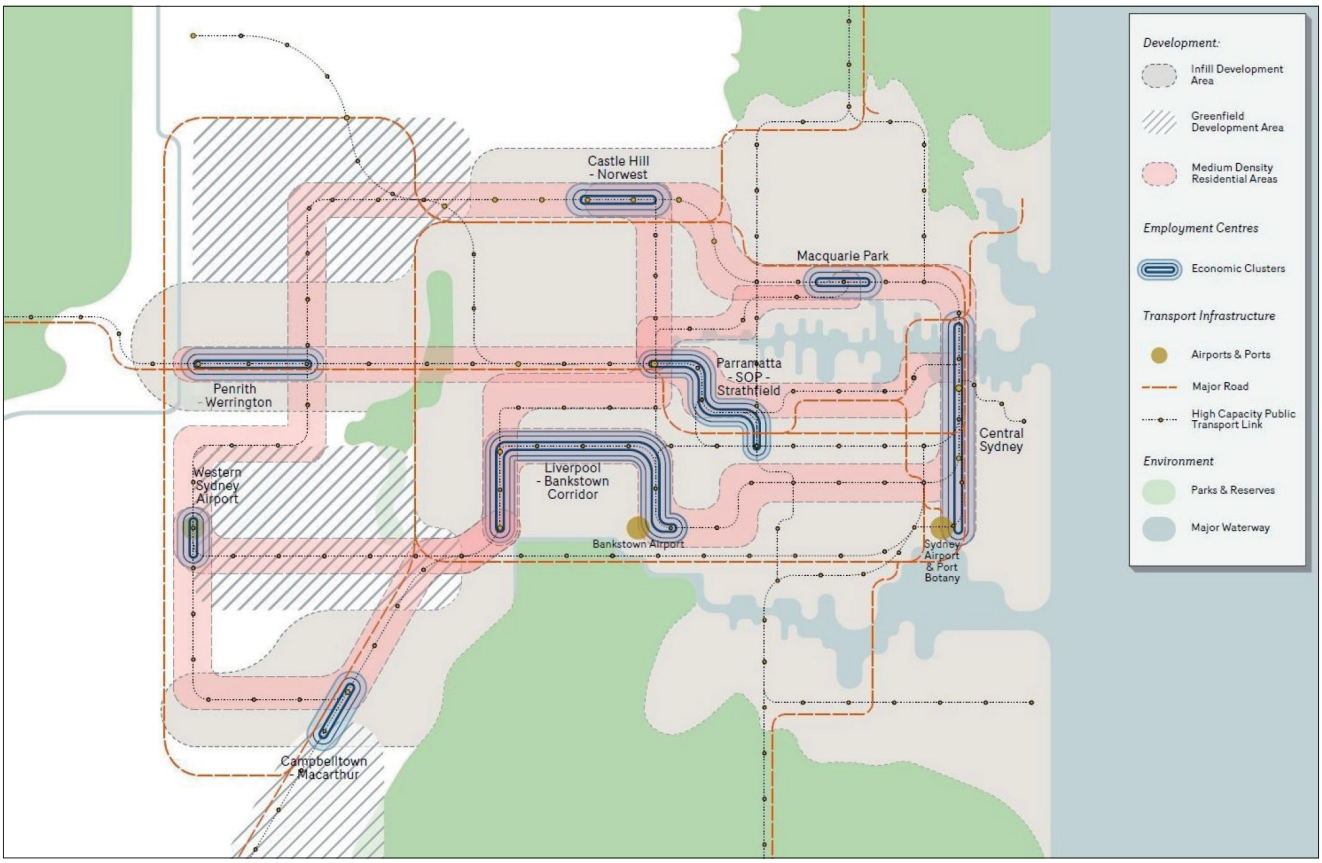


Figure 19. *Schematic of Rebalanced Medium Density scenario, Sydney*

Table 2. *Key performance indicators comparing the three scenarios* *Source: Infrastructure Australia 2018*

Indicator	2016	2046 scenarios		
		Expanded	Centralised	Rebalanced
Road congestion				
% of km travelled on congested roads in AM peak	15%	28%	30%	28%
Public transport share				
% of trips by public transport in AM peak	26%	32%	35%	35%
Access to hospitals				
% of population in 20 min drive or 30 min by public transport	80%	71%	76%	74%
Access to schools				
% of population in 5 min drive or 20 min by public transport	97%	92%	95%	94%
Access to green space				
% of population within 5 min walk	62%	54%	58%	56%

Table 3. *Sydney's approximate population in 2016 and 2046 projection* *Source: Infrastructure Australia 2018 with NSW Government population projection*

	2016	2046	Change
Population	4,680,000	7,340,000	2,650,000

To answer Questions 41-50, use Figures 15-19, Tables 2-3 and your own understanding of geographical processes.

41 What is the percentage change in Sydney's population from 2016 to its projected population in 2046?

A 18%
B 26%
C 36%
D 46%
E 57%

42 What are the physical constraints to the expansion of Sydney's urban footprint?

A It is too expensive to service an ever-expanding urban fringe.
B It is unsustainable for Sydney to keep growing.
B Parliament will not allocate the funding for new infrastructure in the outer suburbs.
C People feel isolated if they live too far from the centre of the city.
D There are parks and reserves to the north, south and west and ocean to the east.

43 Under the Expanded Low Density scenario, approximately how many additional people will reside in greenfield developments by 2046?

A 795,000
B 883,000
C 1,855,000
D 2,202,000
E 2,446,000

44 Which statement comparing road congestion in 2046 with that 2016 is most accurate?

A It will be less congested in 2046 under all scenarios.
B It will be less congested in 2046 under the Centralised High Density scenario.
C It will be less congested in 2046 under the Expanded Low Density scenario.
D It will be less congested in 2046 under the Rebalanced Medium Density scenario.
E It will be more congested in 2046 under all scenarios.

45 Which stakeholders are most likely to prefer the Expanded Low Density scenario?

A developers that sell house and land packages
B local government officials
C retailers that are located in the CBD
D Sydney Water Corporation
E Wildlife Preservation Society

IMPORTANT NOTE

Open this page out to see Questions 41-45.

Figure 20. *Example of new housing*

46 According to the scenarios presented, the photo in Figure 20 will be most typical of new housing in suburbs around:

A Hornsby, in the north of Sydney, under the Expanded Low Density scenario

B Hornsby under the Rebalanced Medium Density scenario

C Penrith, in the far west of Sydney, under the Centralised High Density scenario

D Penrith under the Expanded Low Density scenario

E Penrith under the Rebalanced Medium Density scenario

47 How could a politician validly justify supporting the Expanded Low Density scenario over the other two?

A It has the least effect on the traditional character of the inner suburbs.

B It results in the best use of public transport.

C Jobs growth will be located closer to more people in the expanded employment centres.

D New housing estates on the outskirts of cities are more expensive to service.

E There is no need to expand Sydney's existing transport infrastructure.

48 How could a politician validly justify supporting the Centralised High Density scenario over the other two?

A It has the least effect on the traditional character of the inner suburbs.

B It is the most equitable at spreading the population growth across Sydney.

C It results in the best access to social infrastructure.

D Many new jobs will be created building the new transport infrastructure.

E New housing estates on the outskirts of cities are cheaper to service.

49 How could a politician validly justify supporting the Rebalanced Medium Density scenario over the other two?

A It allows the most new housing to be built in the popular beachside suburbs.

B It has the least effect on the traditional character of the inner suburbs.

C It improves the accessibility of Sydney's green spaces.

D It results in better access to social infrastructure.

E Jobs growth will be located closer to more people in the economic clusters.

50 Which statement comparing Sydney's liveability in 2046 with 2016 is most accurate?

A It will be less liveable in 2046 under all scenarios.

B It will be more liveable 2046 under all scenarios.

C It will be more liveable in 2046 under the Centralised High Density scenario.

D It will be more liveable in 2046 under the Expanded Low Density scenario.

E It will be more liveable in 2046 under the Rebalanced Medium Density scenario.

Thank you for taking part in the 2019 Australian Geography Competition.