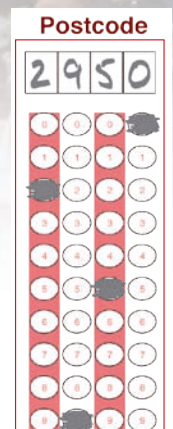


I N S T R U C T I O N S

- 1 Fill in your **name**, **school code** (your teacher will give you this), school's **postcode**, your **gender** and **age**. You must fill in the ovals, not just write the letters and numbers, as the computer only reads the ovals. For example, a filled-in postcode (for some other school) would look like the sample on the right. Also fill in an oval in the school assigned column if instructed to do so by your teacher. Otherwise leave it blank.
- 2 If you are 13 years or under on 31 August 2008 complete Questions 1-30, or continue to Question 40 to be eligible for major prizes.
- 3 If you are 14 or 15 years old on 31 August 2008 complete Questions 1-40.
- 4 If you are 16 years or over on 31 August 2008 complete Questions 16-50.
- 5 Answer all questions by filling in **only one** oval on the answer sheet corresponding to the most appropriate answer for each question.
- 6 You have 35 minutes to answer the questions. The time to fill in the preliminary information is extra.
- 7 Do not mark the front or back of the answer sheet in any other way as this can lead to errors in the computerized marking, or to your not getting a result.



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Figure 1. Section of South America

Start at Question 1 if you are **under 16 years** old on 31 August 2008.
Start at Question 16 if you are older.

1 Which ocean is shown in the map in Figure 1?

- A Arctic
- B Atlantic
- C Indian
- D Pacific
- E Southern

2 Which mountain range lies close to the coast shown in Figure 1?

- A Andes
- B Himalayas
- C Rocky Mountains
- D Sierra Nevada
- E Urals

3 Which country is shaded yellow in Figure 1?

- A Pakistan
- B Panama
- C Peru
- D Philippines
- E Portugal

4 Which term, used for a warming of the ocean off the coastline in Figure 1, is associated with flooding in that country, and with drier than usual conditions in eastern Australia?

- A Agulhas
- B Benguela
- C Doldrums
- D El Niño
- E La Niña

5 Apart from the capitals, which is Australia's most populous city?

- A Geelong
- B Launceston
- C Mandurah
- D Newcastle
- E Townsville

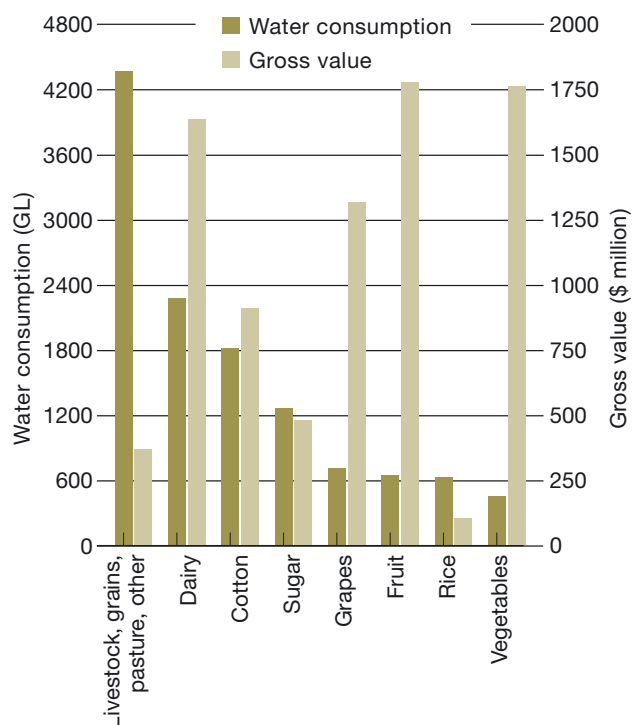


Figure 2. Irrigation water consumption and gross value of production for irrigated agriculture, Australia 2004-05
Source: ABS

6 Using Figure 2, how much irrigation water was used to grow cotton in Australia in 2004-05?

- A 540 GL
- B 761 GL
- C 908 GL
- D 1822 GL
- E 2276 GL

7 Using Figure 2, from which agricultural use did Australia make the most money per gigalitre of irrigation water in 2004-05?

- A cotton
- B dairy
- C livestock, grains, pasture, other
- D rice
- E vegetables

8 Barossa and Clare are names of:

- A coal-mining towns in Queensland
- B old-growth forest areas in Tasmania
- C skifields in New South Wales
- D tourist destinations in Western Australia
- E wine-growing valleys in South Australia

9 Using Table 1, approximately what percentage of Australia's population was living in New South Wales in June 2007?

- A 1%
- B 21%
- C 33%
- D 69%
- E 72%

10 Using Table 1, which state had the highest population growth rate from June 2006 to June 2007?

- A New South Wales
- B Queensland
- C South Australia
- D Victoria
- E Western Australia

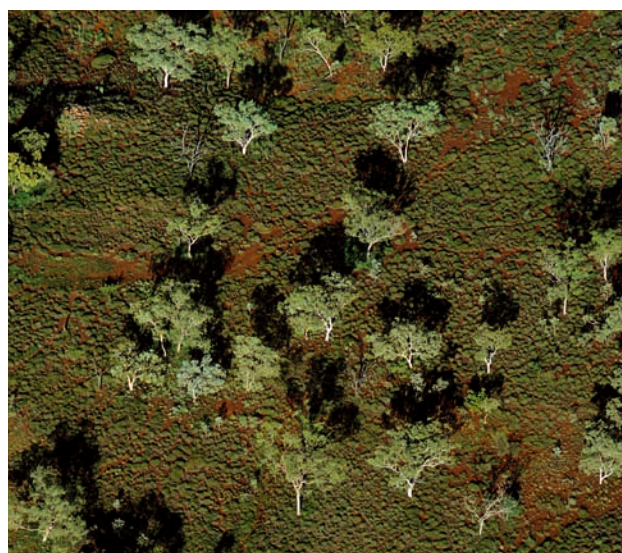


Figure 3.

© National Geographic Channels International, Jeff Hutchens

11 Which vegetation community is shown in the aerial photo in Figure 3?

- A desert
- B grassland
- C heath
- D rainforest
- E woodland

12 The map in Figure 4 (next page) shows a portion of which state or territory?

- A Australian Capital Territory
- B Northern Territory
- C Queensland
- D South Australia
- E Victoria

Table 1. Preliminary key population data, June 2007

Source: ABS

	Population at end Jun qtr 2007 ('000)	Change over previous year (‘000)	Change over previous year (%)
New South Wales	6 889.1	71.9	1.1
Victoria	5 205.2	76.9	1.5
Queensland	4 182.1	90.5	2.2
South Australia	1 584.5	16.3	1.0
Western Australia	2 105.8	46.7	2.3
Tasmania	493.3	3.4	0.7
Northern Territory	215.0	4.3	2.0
Australia Capital Territory	339.9	5.6	1.7
Australia¹	21 017.2	315.7	1.5

¹ Includes other territories comprising Jervis Bay Territory, Christmas Island, Cocos (Keeling) Islands

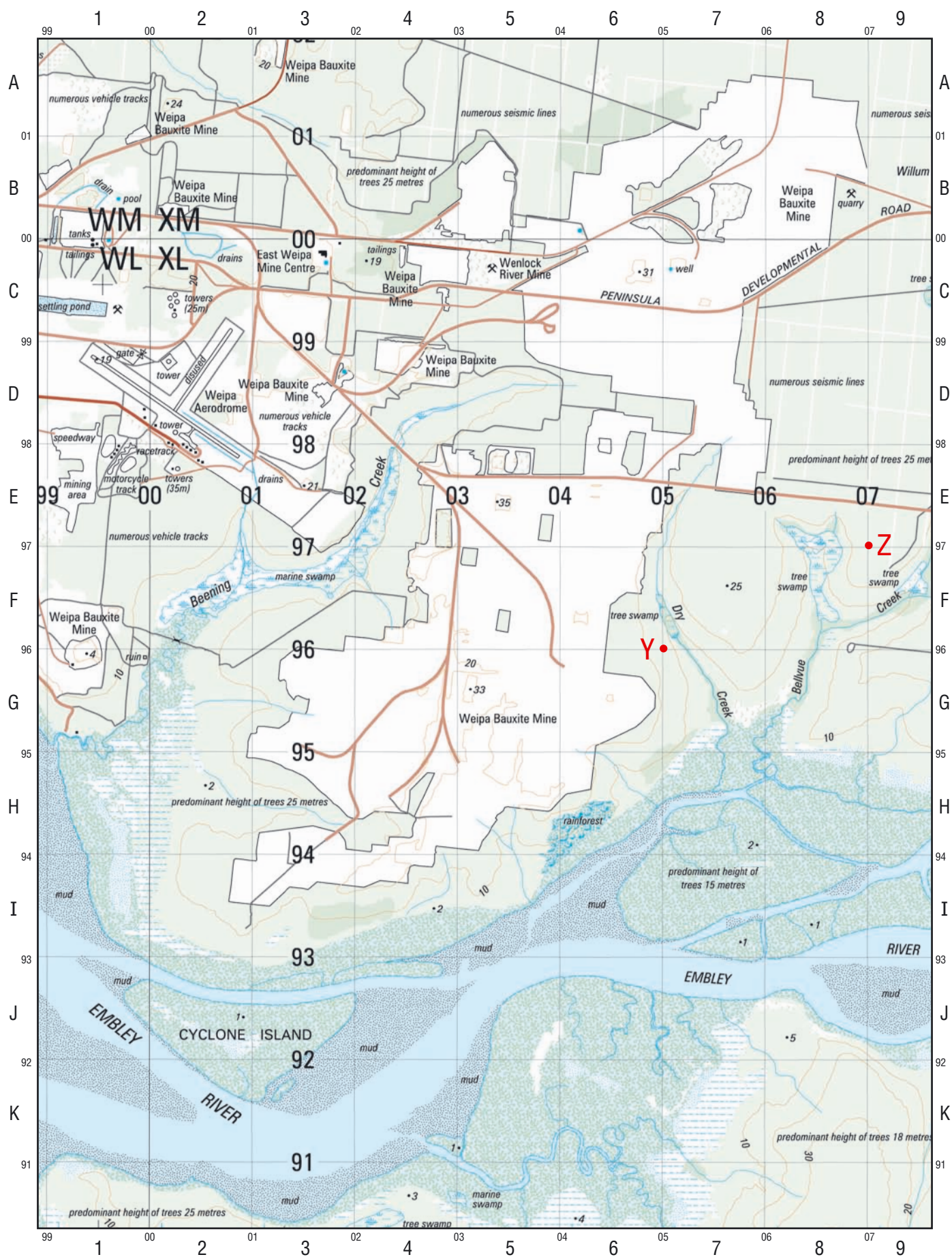
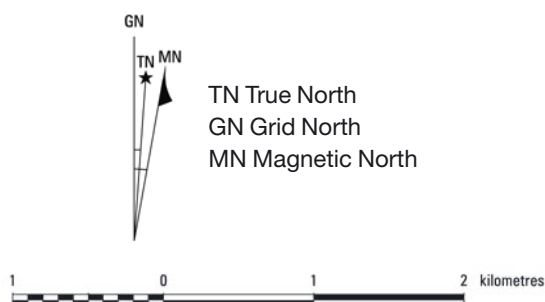


Figure 4. Topographic map

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Legend

Built-up area; Divided highway; State route marker	
Recreation reserve with oval; Drive-in theatre; Underpass	
Sealed road two or more lanes; National route marker	
Sealed road one lane; Cutting; Embankment	
Unsealed road two or more lanes; Culvert; Causeway	
Unsealed road one lane; Approximate position (AP)	
Vehicle track; Road bridge; Gate; Stock grid	
Foot track; Foot bridge	
Multiple track railway; Siding; Station	
Single track railway; Light railway	
Railway tunnel, bridge, Expansion (point of change)	
Power transmission line	
Administrative boundary	
Mine; Building; Ruin; Yard	
Windmill; Communication tower; Dish	
Fence; Horizontal control point; Spot elevation	
Contour with value and cliff; Depression contours	
Sand; Distorted surface; Sand dune	
Levee; Sand ridge	
Ridgeline; Fault line	
Trees; Dense, medium, scattered; Cleared lane	
Scrub; Scrub Light	
Rain forest; Pine; Lone tree	
Orchard; Line of trees or windbreak	
Watercourse definite; Watercourse indefinite	
Area subject to inundation; Swamp	
Perennial lake; Watercourse	
Intermittent lake; Watercourse	
Mainly dry lake; Watercourse	
Rapids; Falls; Spring	
Tank or small dam; Waterhole	
Saline coastal flat; Intertidal flat	
Lighthouse; Intertidal ledge or reef	
Exposed wreck; Submerged wreck	
Submerged reef; Submerged rock	
Mangrove; Rock bare or awash	



© Commonwealth of Australia

13 The main runway at Weipa Aerodrome (D2 in Figure 4) runs approximately:

- A east - west
- B north - south
- C northeast - southwest
- D northwest - southeast
- E southwest - southeast

14 What is the length of the main runway at Weipa Aerodrome (D2 in Figure 4)?

- A 0.75 km
- B 1 km
- C 1.5 km
- D 1.75 km
- E 2 km

15 What is the predominant vegetation on Cyclone Island (J2 in Figure 4)?

- A dense trees
- B mangroves
- C marine swamp
- D rainforest
- E tree swamp

Start at Question 16 if you are **16 years** old or over on 31 August 2008. If you are younger, continue answering questions.

16 What is located at Grid Reference 999989 in Figure 4?

- A gate
- B medium density trees
- C mine
- D tower
- E runway

17 The roads and streams shown in this map (Figure 4) suggest that the port facilities for the export of bauxite are located to the:

- A east of the map
- B north of the map
- C south of the map
- D southeast of the map
- E west of the map

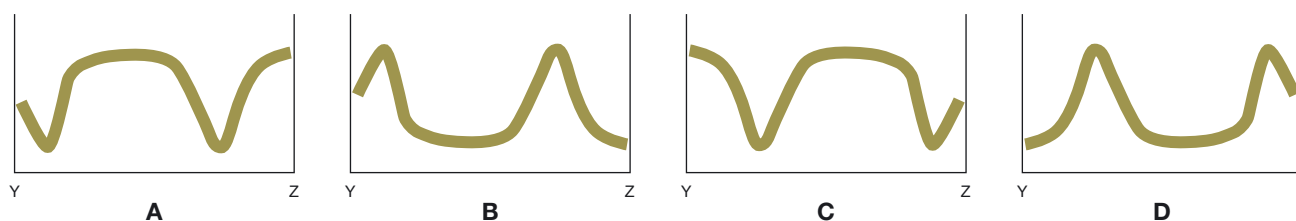


Figure 5.

18 Which sketch diagram in Figure 5 approximates the cross section from Point Y (F6) to Point Z (E9) in Figure 4?

- A diagram A
- B diagram B
- C diagram C
- D diagram D
- E none of the above

19 The bauxite mined at Weipa is primarily used to produce:

- A aluminium
- B china
- C chrome
- D plastic
- E steel

20 Which country has the world's largest Muslim population?

- A India
- B Indonesia
- C Nigeria
- D Pakistan
- E Saudi Arabia

21 What is the term for the movement of dissolved nutrients down through the soil profile?

- A humus
- B infiltration
- C leaching
- D salinisation
- E soil creep

22 Victoria Falls, one of the world's greatest waterfalls, is located on the border between:

- A Argentina and Brazil
- B Canada and USA
- C China and India
- D Germany and Switzerland
- E Zambia and Zimbabwe



Figure 6.

© National Geographic Channels International, Jeff Hutchens

23 Which type of rock is shown in Figure 6?

- A conglomerate
- B igneous
- C metamorphic
- D sedimentary
- E none of the above

24 The photo in Figure 6 was taken in, and is typical of areas in:

- A Florida
- B Hawaii
- C Iowa
- D New York
- E Texas

25 Which state has been most successful with cloud seeding, to increase water availability for its hydro-power industry?

- A New South Wales
- B South Australia
- C Tasmania
- D Victoria
- E Western Australia

26 Which is the most accurate description of Canberra's climate?

- A equatorial oceanic climate with wet and dry seasons
- B Mediterranean climate with hot, dry summers and mild, wet winters
- C relatively dry continental climate with warm to hot summers and cool to cold winters
- D subtropical climate with warm to very warm wet summers and cool to mild dry winters
- E tropical climate with hot and humid summers and warm winters

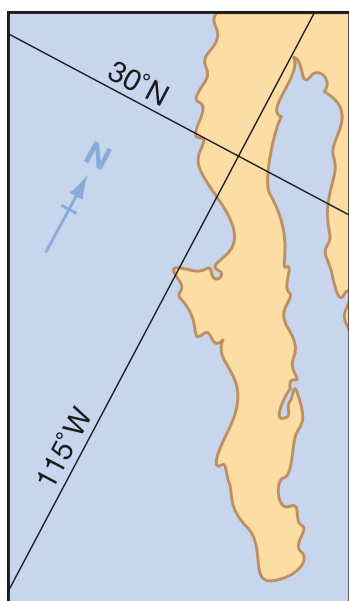


Figure 7.

27 Which peninsula is shown in Figure 7?

- A Antarctic
- B Baja California
- C Italian
- D Malay
- E Scandinavian

28 Which cities lie on the banks of the Danube River?

- A Amsterdam and Brussels
- B Athens and Rome
- C Budapest and Vienna
- D Lisbon and Madrid
- E Oslo and Stockholm

29 Volunteers are working to stop which feral animal spreading into Western Australia in 2008?

- A camel
- B cane toad
- C cat
- D fox
- E rabbit

30 Which sequence of diagrams in Figure 8 best represents the formation of an oxbow lake?

- A A, B, C, D
- B B, D, C, A
- C C, A, D, B
- D C, B, A, D
- E D, B, A, C

If you are **under 14 years** old on 31 August 2008 you may stop at Question 30 or continue to Question 40 to be eligible for major prizes.

31 An oxbow lake is also called a:

- A bay
- B berm
- C billabong
- D bog
- E butte

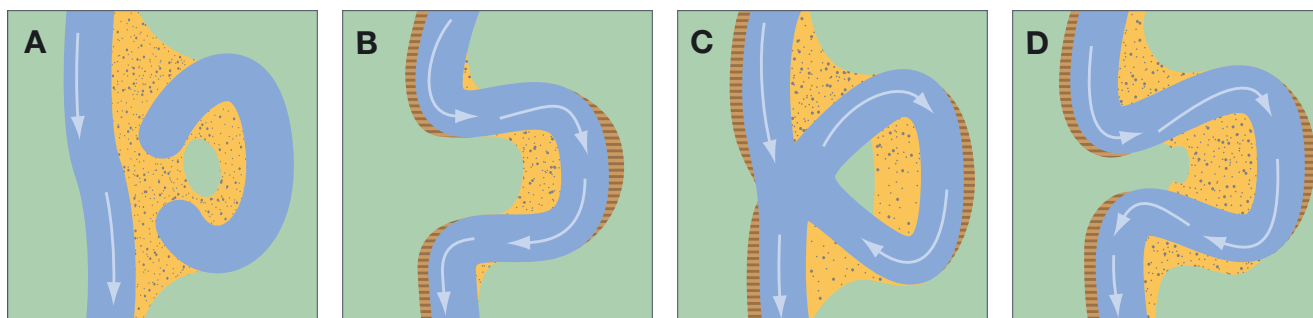


Figure 8.

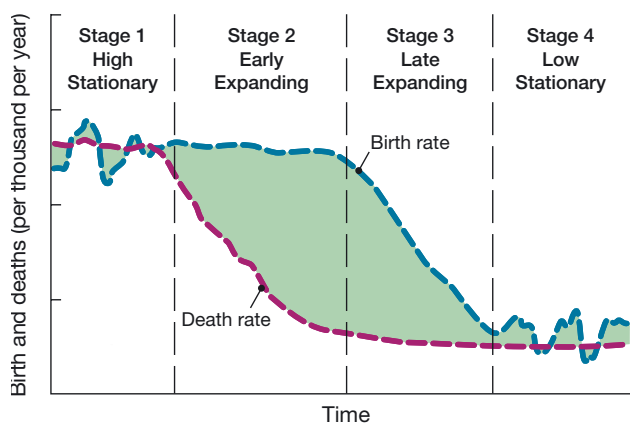


Figure 9. Demographic transition model

32 The difference between birth and death rates, shaded green in the model in Figure 9, is called the:

- A differential mortality rate
- B infant mortality rate
- C natural increase
- D total fertility
- E total population

Table 2. Average crude birth and death rates, 2000-05

Source: UNEP Geo Data

Country	Birth rate (births per 1000 people)	Death rate (deaths per 1000 people)
Brazil	20.6	6.3
China	13.6	6.6
Japan	9.0	8.0
Vietnam	20.2	5.2
Zambia	41.9	21.7

33 Using Figure 9 and Table 2, which of these best represents a country in Stage 2 of Demographic Transition?

- A Brazil
- B China
- C Japan
- D Vietnam
- E Zambia

34 The Gippsland Basin is a source of:

- A coal
- B iron ore
- C oil and gas
- D silver, lead and zinc
- E all of the above

35 The disruption of traditional Aboriginal burning practices in Arnhem Land has led to:

- A a greater number of intense fires that burn tree canopies
- B more fires that spread over large areas
- C more greenhouse gases released into the atmosphere
- D reduced biodiversity
- E all of the above

36 Which option lists the target changes in greenhouse gas emissions to be achieved by Australia, New Zealand and United Kingdom, respectively, under the Kyoto Protocol?

- A -8%, 0%, -8%
- B -8%, +8%, 0%
- C 0%, +8%, -8%
- D +8%, 0%, -8%
- E +8%, 0%, +8%

37 The chart in Figure 10 is from which date?

- A 30 April 2007
- B 1 June 2007
- C 30 August 2007
- D 1 October 2007
- E 30 December 2007

38 What is the term for a line such as —1012— in Figure 10?

- A aneroid
- B hydrophyte
- C isobar
- D isohyet
- E monoclone

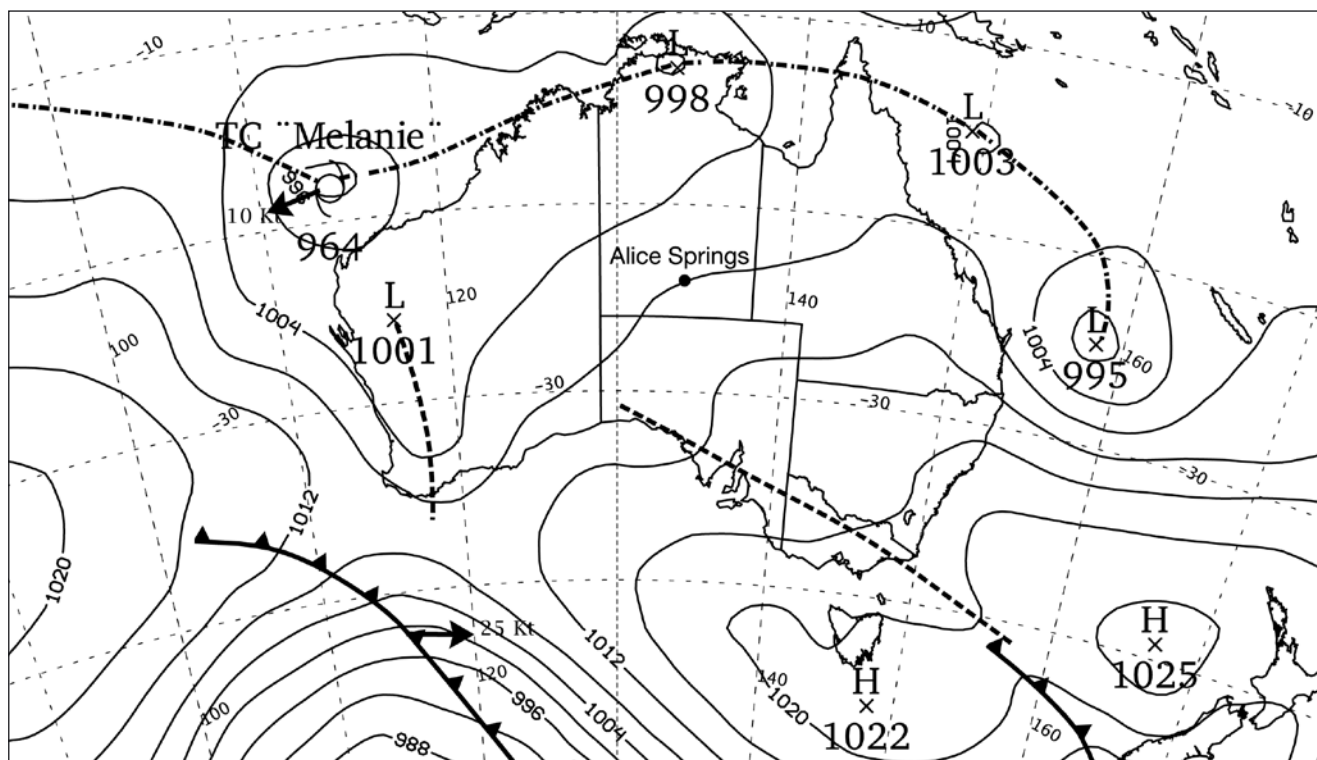


Figure 10.

Source: Bureau of Meteorology

- 39 What was the air pressure in Alice Springs at the time of the chart (Figure 10)?
- A 1000 hPa
 - B 1005 hPa
 - C 1006 hPa
 - D 1008 hPa
 - E 1010 hPa
- 40 The weather in Hobart on the date of the chart was typical of the pattern shown in Figure 10. It was:
- A fine
 - B foggy
 - C raining
 - D snowing
 - E windy
- 41 In general, the wind in Brisbane on the day of the chart (Figure 10) was blowing from the:
- A northeast
 - B northwest
 - C southeast
 - D southwest
 - E west
- 42 In Figure 10, what does the line joining the low pressure systems across northern Australia represent?
- A cold front
 - B monsoon trough
 - C ridge
 - D squall line
 - E warm front
- 43 Which type of chart is shown in Figure 10?
- A bathymetric
 - B choropleth
 - C relief
 - D synoptic
 - E topographic

If you are **under 16 years** old on 31 August 2008 stop at Question 40. If you are older, continue to end.

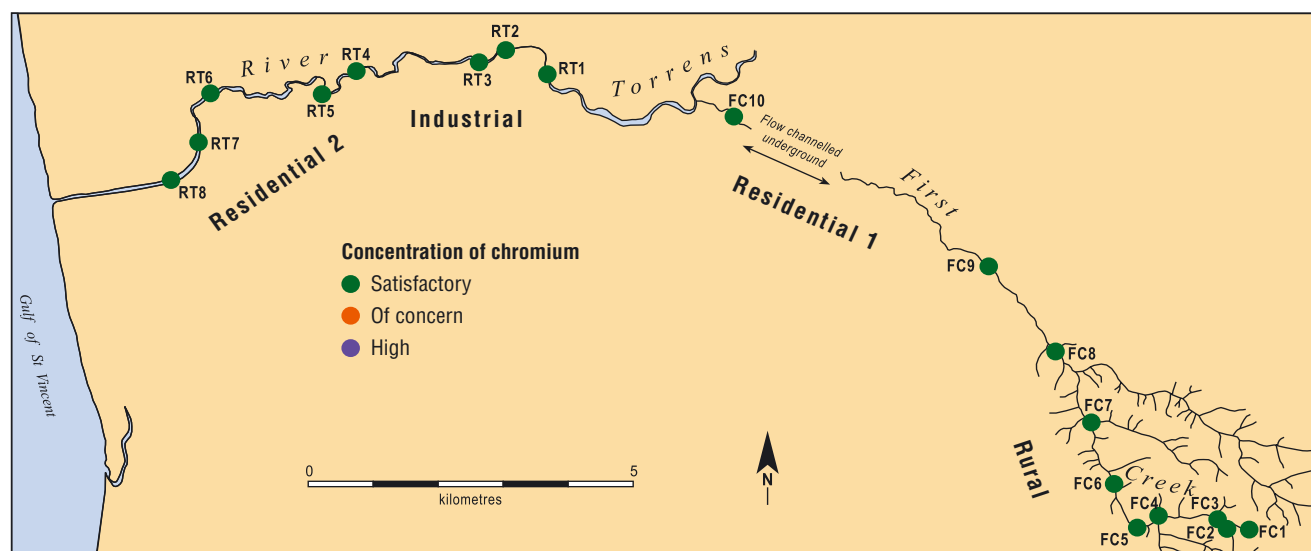


Figure 11. Concentration of chromium in bed sediment (sand, mud and plant material) along First Creek and River Torrens, by comparison with Australian guidelines for sediment quality

Source: S.J. Gale et al

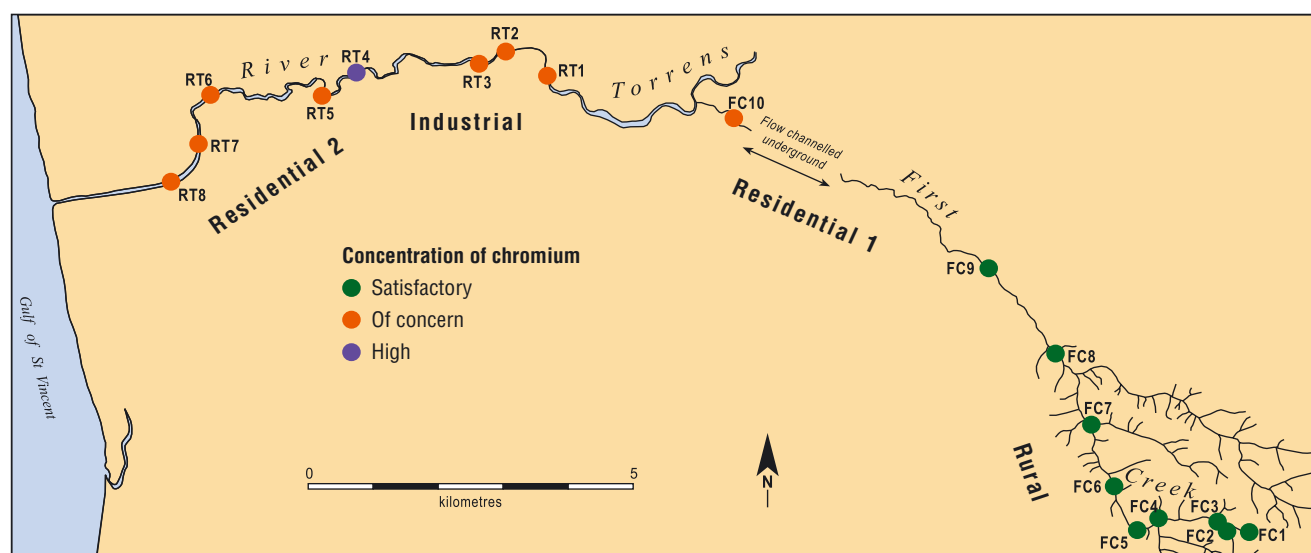


Figure 12. Concentration of chromium in the mud and plant component of bed sediment along First Creek and River Torrens, by comparison with Australian guidelines for sediment quality

Source: S.J. Gale et al

Table 3. Content ($\mu\text{g g}^{-1}$) of cadmium, chromium, copper, lead and zinc in bed sediment (sand, mud and plant material) of River Torrens and First Creek, and comparison with Australian sediment quality guidelines

Source: S.J. Gale et al

	Rural								Residential 1		Industrial				Residential 2			
	FC1	FC2	FC3	FC4	FC5	FC6	FC7	FC8	FC9	FC10	RT1	RT2	RT3	RT4	RT5	RT6	RT7	RT8
Metal A	0.3	0.3	0.3	0.5	0.1	2.1	0.6	1.1	0.3	0.3	1.2	1.6	2.5	0.9	2.1	1.7	3.0	1.2
Metal B	97	312	12	63	10	9.1	35	30	27	40	48	110	68	20	100	60	61	40
Metal C	42	35	25	17	9.1	19	34	58	149	122	105	832	152	94	269	157	81	59
Metal D	24	4.2	3.0	3.4	2.4	8.2	14	16	12	15	30	28	35	35	60	40	67	23
Metal E	133	214	37	39	40	160	114	142	184	300	323	593	693	326	897	442	509	231

Compared with guidelines, numbers in green boxes are satisfactory, in orange boxes are of concern, in purple boxes are high

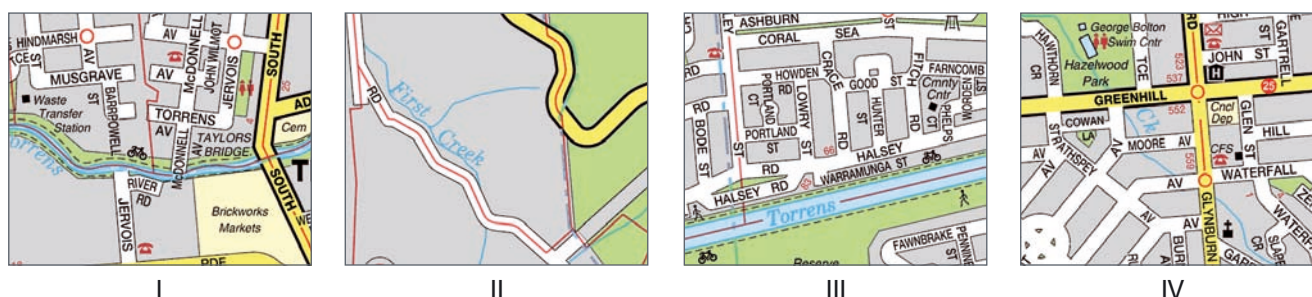


Figure 13. Extracts of maps along First Creek and River Torrens

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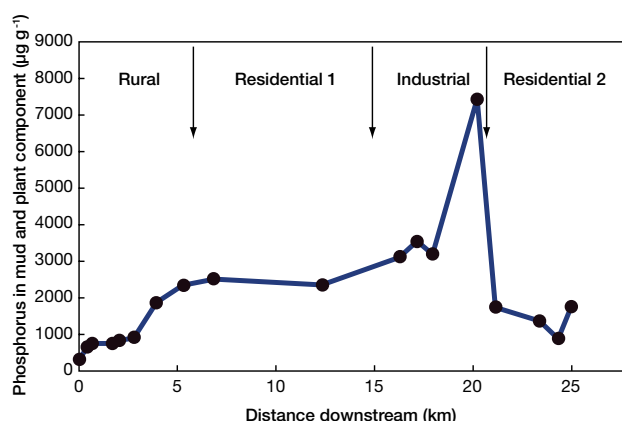


Figure 14. Concentration of phosphorus in mud and plant component of bed sediment with distance downstream along First Creek and River Torrens

Source: S.J. Gale et al

Stream beds build up deposits of various natural materials, including sand, mud and plant material. Metals can be associated with these sediments. These metals may be released from bedrock breakdown, or may be contaminants resulting from human activities. Questions 44 to 50 use results of research into levels of contamination in bed sediments of the River Torrens and one of its tributaries, First Creek. **To answer these questions, use Figures 11-14, Table 3, and your own knowledge.**

44 Which option lists the maps in Figure 13 in a downstream direction?

- A I, III, II, IV
- B II, IV, I, III
- C III, I, IV, II
- D IV, II, III, I
- E IV, III, I, II

45 Using Figures 11 and 12, which statement is correct?

- A Chromium contamination of sediments is greater upstream than downstream.
- B Chromium is more likely to be associated with mud and plant material than with sand.
- C Factories producing chromium waste are mainly located at the mouth of the river.
- D Most chromium is released from bedrock at the source of First Creek.
- E Rural areas have a significant chromium pollution problem.

46 Which metal in Table 3 is chromium?

- A Metal A
- B Metal B
- C Metal C
- D Metal D
- E Metal E

47 For Metal C in Table 3, the minimum value specified as high in the sediment quality guidelines is:

- A 110 µg g⁻¹
- B 220 µg g⁻¹
- C 330 µg g⁻¹
- D 440 µg g⁻¹
- E 550 µg g⁻¹

48 Which zones recorded the greatest increases of phosphorus concentration in mud and plant material?

- A Industrial and Residential 2
- B Residential 1 and Industrial
- C Residential 1 and Residential 2
- D Rural and Industrial
- E Rural and Residential 1

49 The highest level of phosphorus concentration recorded is most likely due to which source?

- A agricultural fertilizers and animal manure
- B domestic use of fertilizers and pet excrement
- C effluent from a fertilizer factory previously located on the bank
- D erosion of super-phosphate enriched soils
- E subsoil derived from naturally occurring phosphorus

50 Pollution problems in the Torrens are likely to persist because:

- A being in a high rainfall area means new pollutants are continually added
- B further contaminants are being added from the Murray River
- C removing water for drinking increases concentrations of pollutants
- D the steep terrain encourages persistent pockets of sediments
- E weirs and sluice gates have reduced the natural flushing of the river

Thank you for taking part in the
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