# **GEOGRAPHY BULLETIN**

and the second

# VOLUME 52 No 3 2020 SUPPLEMENT



Geography Teachers Association of NSW & ACT Inc.

#### IN THIS SUPPLEMENT:

#### IN THE CLASSROOM

Feedback matrix template Hills Grammar Formative assessment templates

HSC Exam preparation templates

HSC Revision Crosswords 1 and 2

#### **BIOPHYSICAL INTERACTIONS**

Exploring the cryosphere

- KNWR Chart
- Exploring the cryosphere: Activities 1–4
- CRAP and CRAAP evaluation templates
- Futures wheel / Consequence wheel
- Exploring the cryosphere: Resource list
- Biophysical interactions with the cryosphere
- Biophysical interactions
- Hydrosphere recall activity: Transfer of water.
- Atmosphere recall activity: Miracle in a storm
   Biosphere recall activity: Risk and reward
- biosphere recall activity: Nisk and
   Lithosphere recall activity:
- Its wrong. Can you fix it?

#### ECOSYSTEMS AT RISK

Great Barrier Reef: Catalyst activities

#### PEOPLE and ECONOMIC ACTIVITY

Economic activities and COVID-19: Activities 1–4

#### STAGE 6 SKILLS

Tourism: Sources A and B Great Barrier Reef: Source C Mega cities: Dharavi slum: Source D, E, F, G Cryosphere: Sources H, I, J.

# STUDENT ACTIVITIES



of NSW & ACT Inc.

# OFFICE OF THE GEOGRAPHY TEACHERS ASSOCIATION of NSW & ACT Inc

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#### ANNUAL MEMBERSHIP (Subscriptions include GST)

Personal membership \$90.00 Corporate membership (school, department or business) \$200.00 Concessional membership (retiree or part-time teacher) \$40.00 Primary corporate and pre-service teacher membership free

# **GEOGRAPHY BULLETIN** VOLUME 52 No 3 2020 – SUPPLEMENT

# **STUDENT ACTIVITIES**

#### IN THE CLASSROOM

-eedback matrix template – Khya Brooks	2
Hills Grammar Formative assessment program templates – Grace Larobina	3
HSC Exam preparation templates – Lorraine Chaffer	10
HSC Revision Crosswords 1 and 2 – David Proctor	15

#### **BIOPHYSICAL INTERACTIONS**

Exploring the cryosphere – Lorraine Chaffer KNWR Chart ...... 22 CRAP and CRAAP evaluation templates ......27 \_ \_ **Biophysical interactions – Lorraine Chaffer** \_ \_ **ECOSYSTEMS AT RISK** PEOPLE AND ECONOMIC ACTIVITY **STAGE 6 SKILLS** 

NOTE: VISUAL RESOURCES USED IN ACTIVITIES ARE INCLUDED IN THE PPT PRESENTATIONS THAT ACCOMPANY GEOGRAPHY BULLETIN 52, No 3

# **IN THE CLASSROOM: FEEDBACK MATRIX**

	Question 1	
	Response 1	
<b>1</b>	Question 2	
STE		
•		
	Response 2	
	Teacher Feedback	Teacher Feedback
	STRENGTH	LIMITATION
7		
ЕР		
ST		
	Self-identified strategy	
	(what are you going to do to fix the limitat	.1011)
Б		
Ë		
<b>V</b> 1		

Shared by Khya Brooks for Geography Bulletin Edition 52, No 3 For instructions see 'Building Confidence and Success in Stage 6' Page 7



Hills Grammar

# YEAR 12 GEOGRAPHY FORMATIVE ASSESSMENT TIMETABLE

TIME	OUTLINE
10.30–12.30 EXAM	Complete the <i>Formative Assessment Writing Task</i> in quiet timed conditions [2 Hours + 5 Minutes]
1.30–2.00 MULTIPLE CHOICE 30 Minutes Task 1 Task 2	<ul> <li>Students work in groups of <b>THREE</b> to determine the correct answer</li> <li>Complete the <b>Justification</b> template</li> </ul>
2.00 – 2.30 SHORT ANSWERS 30 Minutes	<ul> <li>Students to complete the Marking Criteria based on how they would allocate marks to the missing bands</li> </ul>
Task 4	<ul> <li>Students to read ONE script and offer to feed up to peers</li> </ul>
	<ul> <li>Use colour-code provided to highlight parts of the Rubric</li> </ul>
2.30–3.15 EAR RESPONSE 40 Minutes Task 3 Task 5	<ul> <li>Students to read <b>ONE</b> script and offer to feed up to peers</li> <li>Use colour- code provided to highlight parts of the Rubric</li> </ul>
3.15- 3.45 PEER and SELF EVALUA- TION 30 Minutes	<ul> <li>Students will self-evaluate their writing and thinking concerning the suggested marking criteria</li> <li>Complete the self-evaluation</li> </ul>
Task 6	
3.45 - 4.00	Discussion: Where to from here?
Over the Holiday	Submit <b>ONE</b> response in Week 1 Term 3 incorporating all the 'feed up' so you can " <b>bust up the Bands"</b> !

Shared by Grace Larobina See program details Geography Bulletin Edition 52, No 3 page 13

# FORMATIVE TASK ONE

## **MULTIPLE CHOICE: Error Categories**

Error Categories	Questions incorrect	Marks lost
I don't recall ever seeing questions like this before		
I recall seeing questions like this but <b>never learned</b> / <b>understood</b> how to do them		
I learned and understood how to do this, but on the assessment, <b>I forgot how to do</b> the question		
I learned and understood how to do this, but on the assessment, I <b>misinterpreted</b> the question		
I knew how to do this but <b>did not fully answer</b> the question		
I choose the <b>least-best option</b> (even though my answer could be correct)		
Total Marks Lost:		



# Three important lessons about multiple choice

# **FORMATIVE TASK TWO**

#### Justify your choice

In groups, discuss your options and come to a collective decision as to the most correct answer.

Your Answer	Collective Answer	Justification Statement	
1.			
2.			
3.			
4.			
5.			
б.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

Self-evaluate, did you change your original response?

Student self-evaluation - TWO pressing content areas to revise

# **FORMATIVE TASK THREE**

TASK: In pairs, build your criteria for each Band. Think about what characteristics a script would have.

Section III Extended Response

20 Marks

#### In your answers, you are assessed on how well you:

Demonstrate geographical knowledge and understanding relevant to the question Communicate ideas and information using geographical terms and concepts appropriately Refer to case studies, illustrative examples and the Stimulus Booklet where appropriate Present a sustained, logical and cohesive response

Criteria	Marks
	17–20
	13–16
<ul> <li>Demonstrates knowledge and some understanding about the relationships between natural stress, human-induced modifications and the vulnerability and resilience of ecosystems at risk.</li> <li>Identifies issues related to the vulnerability and resilience of ecosystems at risk.</li> <li>Refers to relevant case studies/illustrative examples.</li> <li>Presents a cohesive answer using appropriate geographical information.</li> </ul>	9–12
	5-8
	1-4

\* Retrieved from NESA 2010 EAR Geography HSC Marking Guidelines

# FORMATIVE TASK FOUR

When constructing a graph, how to allocate marks?

Task: In pairs, determine the Marking Criteria for Question 23: Construct a percentage bar graph.

Marking Criteria	Marks
	6
	5
	4
	3
	2
	1

THREE key points to remember about constructing graphs.

1.	
2.	
3.	

# **FORMATIVE TASK FIVE**

Task: Swap extended responses, annotate, colour code, and offer suggestions for improvement.

<b>GEOGRAPHY EXTENDED RESPONSE PEER EVALUATION</b>				
What YOU did well	Where YOU can improve			
KNOWLEDGE OF THE QUESTION/ SYLLABUS AREA	Add specific facts and statistics			
<ul> <li>Demonstrate geographical knowledge and understanding relevant to the questions</li> </ul>				
Refer to case studies, illustrative examples and the Stimulus Booklet     where appropriate				
EXPRESSION OF IDEAS				
<ul> <li>Communicate ideas and information using geographical terms and concepts appropriately</li> </ul>				
BOSSY WORD				
EXTENDED RESPONSE STRUCTURE	Structure needs to improve E.g. Context paragraph after your			
	introduction			
ANSWERING THE QUESTION				
INTRODUCTION				
CONTEXT PARAGRAPH				
BODY				
CONCLUSION				
My goals for the next assessment task [Trial HSC]	How will I reach my goals?			
	1			

NOTE: Refer to individual student script for more detailed peer and self-evaluation

Teacher Interview date: \_\_\_\_\_

l intend to do further research and submit my rewritten response for teacher review on:

Signed – Teacher:\_\_\_\_\_

Student: \_\_\_\_\_

# FORMATIVE TASK SIX

Task: PEER REFLECTION & SELF EVALUATION

	SECTION 1	SECTION 2 SHORT ANSWERS		SECTION 3
	MULTIPLE CHOICE	PART A	PART B	ECOSYSTEMS AT RISK
STRENGTHS		Short Answers	Graph Construction	
AREAS TO IMPROVE				
GOALS/ PEER INTERVIEW				

# **EXAM PREPARATION ACTIVITY**

Instructions: Here is a list of potential examination questions.

**Colour code** the difficulty (Diff) column to show how difficult you think each question is.

Place a X in the 'Help' column if you need advice to answer this question.

Plan responses to a variety of question types and difficulty levels. Use a planning template.

Write full answers to a selection of these.

#### **TOPIC: ECOSYSTEMS AT RISK**

Easy	Medium	Difficult	Very Difficult

\* Select a colour to complete the key

QUESTION	Diff	Help
Extended responses – 20 marks		
Explain the importance of ecosystem management and protection in ecosystems at risk.		
Analyse the biophysical interactions that occur in ONE ecosystem at risk.		
Explain how ONE ecosystem at risk has demonstrated both vulnerability and resilience in response to natural stress and human induced modifications		
Assess the impact of humans on the functioning of TWO ecosystems at risk.		
Discuss how management strategies could be used to address human impacts that are placing TWO ecosystems at risk.		
Evaluate traditional and contemporary management strategies of TWO ecosystems at risk in terms of ecological sustainability		
Assess the effectiveness of the strategies that have been used to manage the threats to at least ONE ecosystem at risk.		
Short answers		
Compare the effect of latitude on the nature of TWO different ecosystems at risk. (3)		
Outline how changes in weather or climate can affect an ecosystem. (2)		
Explain how biophysical factors influence where an ecosystem at risk is located (4)		
Outline why utility value is a reason to protect ecosystems. (2)		
Why is it important to manage and protect ecosystems? 6 marks		
How is an ecosystem you have studied both vulnerable and resilient? (4)		
How has ONE ecosystem at risk responded to natural stress? (6 )		
Describe how the nature of and rate of change in ONE ecosystem at risk affect its functioning. (6)		
Outline how ONE example of human-induced stress has affected the functioning of an ecosystem. (2)		

Shared by L Chaffer. See Geography Bulletin Edition 52, No 3

#### **TOPIC: URBAN PLACES**

Easy	Medium	Difficult	Very Di	fficult
	QUESTION		Diff	Help
Extended responses – 20 r	marks			
Explain how the nature and global networks.	distribution of world cities af	fect their role in the operation		
Discuss the effects of urban	dynamics on a large city in th	ne developed world.		
Account for changes in both in a large city from the deve	n social structure and patterns loped world.	s of advantage and disadvantag	ge	
Analyse responses to the ch	allenges of living in mega citi	es		
Contrast the nature and cha cities.	racter of mega cities in the de	eveloping world with world		
Account for the changing na	ature, character and spatial di	stribution of mega cities		
Analyse the impact of urban the developed world.	dynamics on the ecological	sustainability of a large city in		
Short answers				
Using an example, outline w	hat exurbanisation means. (2	2)		
Outline how ONE urban dyr you have studied. (2)	namic of change is operating	in a country town or suburb th	at	
How does the changing role	e of regional centres affect sm	nall towns? (3)		
How has ONE urban dynam country town or suburb? (4)	ic, other than urban village, cl	hanged the character of a		
Outline the spatial distribution in your answer (3)	on of megacities in the devel	oping world. Include examples	,	
How have megacities in the living in megacities? (3)	developing world responded	d to TWO of the challenges of		
Explain the role of world citi	es. (6)			
Explain why world cities are	important centres of econom	nic and cultural authority. (6)		
Using examples, explain the of dominance and depende	relationship between world nce. (6)	cities and other centres in term	IS	
Contrast mega cities in the c and spatial distribution. Inclu	developing world with world ude examples in your answer	cities in terms of their nature . (6)		

#### **TOPIC: PEOPLE AND ECONOMIC ACTIVITY**

Easy	Medium	Difficult	Very Di	ficult
	QUESTION		Diff	Help
Extended responses – 20 r	narks			
Explain the factors that have activity.	e influenced the nature and sp	patial pattern of ONE economic	2	
Explain how biophysical and activity in a global context.	l technological factors affect 1	the nature of ONE economic		
Analyse the environmental a	and social impacts of ONE ecc	pnomic activity.		
Explain how an economic ac ecological sustainability.	ctivity you have studied has re	esponded to the challenges of		
Explain how locational facto operating at a local scale.	rs have influenced the charac	cter of an economic enterprise		
Evaluate factors that have in at a local scale.	fluenced the location of an e	conomic enterprise operating		
Analyse how an economic e changes	nterprise operating at a local	scale can be affected by globa	1	
Short answers				
Explain the social impact and	d economic impact of an eco	nomic activity you studied (6)		
Outline how ONE biophysica you studied (3)	al factor affects the spatial pat	ttern of an economic activity		
Discuss how the use of tech studied (4)	nology has affected the natur	re of an economic activity you		
Account for the future direct	tion of ONE economic activity	/. (3)		
Describe the nature of ONE	economic enterprise. (2)			
Outline ONE internal linkage	e associated with ONE econor	nic enterprise. (2)		
Outline ONE external linkage	e associated with ONE econo	mic enterprise. (2)		
Describe TWO ecological dir	mensions associated with ON	E economic enterprise. (4)		
Explain how TWO global cha AN economic enterprise (6)	anges in ONE economic activ	ity affect the future direction o	f	
Explain how an individual ec	conomic enterprise improves	its ecological sustainability. (6)		

Shared by Lorraine Chaffer for Geography Bulletin Edition 52, No 3 Page 17

# **QUESTIONS USING THE STIMULUS BOOKLET**

#### **ECOSYSTEMS AT RISK**

	QUESTION	Diff	Help
2016	<b>Refer to Sources D and F on page 2 of the Stimulus Booklet</b> . (d) Explain how human activities may affect ONE ecosystem in South Western Namibia.		
2013	Using Source B on page 1 of the Stimulus Booklet, explain TWO reasons for the management and protection of ecosystems		
2013	With specific reference to both diagrams, explain the biophysical interactions responsible for the functioning of ecosystems.		
<b>2001</b> a. b.	<b>Refer to Sources I and K</b> . Identify TWO human activities that may place the Avon–Heathcote Estuary at risk. Identify a management strategy currently used in the Avon–Heathcote Estuary and evaluate its likely success in terms of the ecological sustainability of this ecosystem.		
<b>2004</b> a. b.	<b>Refer to the illustration</b> Identify ONE natural stress that could have occurred at B. Describe changes in the functioning of the ecosystem that are likely to occur over the 500 years following the natural stress event at B.		
<b>2008</b> a. b.	Refer to Source D to answer parts (a)–(b). How is the English estuary ecosystem both vulnerable and resilient to natural stress? Explain how human-induced modifications to energy flows would affect this ecosystem.		

#### **URBAN PLACES**

	QUESTION	Diff	Help
2014	Contrast the TWO examples of urban dynamics of change in Source F on page 4 of the Stimulus Booklet.		
2013	With reference to Source G on page 4 of the Stimulus Booklet, account for the rapid growth of megacities in the developing world.		
2013	Using Source H on page 4 of the Stimulus Booklet, explain ONE challenge associated with the provision of services in megacities in the developing world.		
<b>2006</b> C.	<b>Refer to Source I on page 4 of the Stimulus Booklet.</b> Give TWO reasons that explain why the number of mega cities has increased between 1950 and 2000.		
2001	<b>Refer to Sources C, D, F, H and I.</b> From these sources, name TWO locations within Christchurch that demonstrate different urban dynamics, and account for these differences.		

#### PEOPLE AND ECONOMIC ACTIVITY

	QUESTION	Diff	Help
2002	Using Source I on page 4 of the Stimulus Booklet.		
a.	Describe the spatial pattern of the global production of oil in 2000.		
2005	<b>Refer to Source D on page 2 of the Stimulus Booklet.</b> Identify TWO economic activities evident on the map, and account for the location of ONE of these activities. 3 marks		
2007	Refer to Source E on page 3 of the Stimulus Booklet (a)–(d). 8 marks		
a.	Identify an economic enterprise operating in Vancouver.		
b.	State the location of this economic enterprise.		
C.	State TWO locational factors for this economic enterprise.		
d.	Outline possible human impacts on the biophysical environment of the economic enterprise identified in part (a).		

#### VOCATIONAL AND FIELDWORK QUESTIONS

	QUESTION	Diff	Help
2003	Choose ONE vocation, requiring geographical understanding, that is applicable to a workplace likely to be found in the south-west quadrant of the map. Describe TWO DIFFERENT methods that could be employed in the collection of primary geographical data in such a workplace.		
2007	<b>Refer to Source D on page 2 of the Stimulus Booklet.</b> Name and locate an ecosystem that could be investigated using fieldwork. Formulate a geographical question to investigate the ecosystem identified.		
<b>2014</b> b.	Refer to Source E on page 4 of the Stimulus Booklet. National Park rangers plan to conduct a fieldwork investigation to study the impact of tourism on Little Rotamah Island (AR 1227). What are the possible impacts of tourism on this environment? What fieldwork activities could the rangers use to analyse the impact of tourism on this environment? Outline how ONE primary and ONE secondary source could be used by the rangers to provide data and information for their investigation. Recommend a traditional management strategy that may be used to protect this environment.		



#### ACROSS

- 1. These cycle within an ecosystem (N)
- 3. The Minnamurra Rainforest uses these to keep visitors off the ground, but allow them access; wheelchair friendly (RW) (S)
- 6. Coastal dunes are large accumulations of \_\_\_\_
- **8.** Any form of interaction in an ecosystem is considered (M)
- 11. When a plant community enters a new land area as pioneers (e.g. spinifex on dunes) or tries to take over from a native species (I)
- 13. Rainforests generally need more than \_\_\_\_\_ thousand mm of rain each year to survive (T)
- 16. of genetic diversity is important to keep a wide range of genetic traits in populations (M)
- 17. World cities high up on the global urban hierarchy are said to have more \_ than those lower, due to their higher order roles and
  - decision making (D)
- 20. Cronulla and Windang sand dunes have an easterly \_ (A)
- 21. Board and chain paths are used at Cronulla dunes which allow access and promote the natural accretion \_\_\_\_\_\_ to continue (C)
- 22. Natural or human induced \_\_\_\_\_\_ on an ecosystem can cause irreversible damage if pushed beyond an ecosystems amplitude (S)
- 23. Education is often found in ecosystems in the form of a \_\_\_\_\_ , letting people know what they can and cannot do there (S)
- 26. This introduces excess nutrients into local rivers from farms, which make their way to the Great Barrier Reef from inland QLD (R)
- 28. The local Aboriginal people who accessed the Cronulla dune and Kurnell area - part of the Dharawal (G)
- 29. The people who face challenges in mega cities are often \_\_\_\_\_, due to the lack of available employment opportunities (P)
- 30. An ecosystem which receives less than 250mm of rain (D)
- 31. Polar regions have a build-up of \_\_\_\_\_ due to low average temperatures all year round (I)
- Larry hit the Wet Tropics in 2006 causing a natural stress 33. event and wiping out the food of many species (C)
- 36. 80% of plastics are \_\_\_\_\_ in Mumbai compared to only about 30% in developed nations such as England (R)
- 37. Which group of countries would be considered developing?
- 38. Mumbai's topography is generally \_\_\_\_\_ leading to flooding (F)
- 41. Wagga, Dubbo and other inland regional cities are trying to reposition themselves as attractive places to live; called \_ for their energy, vision and opportunity (E)
- 43. This nutrient, said to be a building block, is used by plants in photosynthesis and then moves through the food chain (C)
- 46. A fundamental challenge for people living in megacities is access to \_\_\_\_\_; often made from found materials (H) appropriate \_\_\_\_
- 48. A megacity in Bangladesh; 65% of employment is based in the informal sector (D)
- 49. To keep people out of an ecosystem, usually with fences; it saves them from impacting it further and preserves the ecosystem (E)
- 51. A plant which produces its own energy from the sun; the 1<sup>st</sup> trophic level aka (A)
- **52.** Megacities cannot cope with the high levels of rural-urban migration which leads to this; the inability to meet the needs of the population of that city e.g. housing and sanitation (O)
- 55. An economy which is not regulated by governments and does not pay \_\_\_\_\_; housing settlements which do not have taxes is said to be \_\_\_\_ permission to be built or are properly built are said to be this as well (I)
- 56. An Australian native animal which has had purpose built underpasses to migrate safely across roads instead of being hit by cars around cities like Brisbane; this won't help with its chlamydia (K)
- 57. World cities are said to be \_\_\_\_\_\_ centres as they control the global economy (C)
- \_\_\_\_ between the rich and poor in megacities 58. There is a large (D)
- 59. Megacities which cannot function (see clue 52. across) are found mainly in these type of countries (D)
- 60. Megacities have \_ \_\_\_ 10 million people (O)

#### DOWN

- 2. The country in the ternary graph with the highest percentage of tertiary workers (U)
- 4. A ratio of a map distance compared to its real life distance (S)
- 5. A regional city in NSW (W)
- 6. Australia's primate city (S)
- 7. Alpha world city in Europe (L)
- **9.** Humans can have a positive or impact on ecosystems (N)
- **10.** Distance/speed = \_\_\_\_
- 12. Vertical Exaggeration HS 1:225,000 VS 1:25,000 (N)

(T)

- 14. Water is turned on \_\_\_\_ \_ a day for one hour in Dharavi in response to water shortages (O)
- 15. The extent of an ecosystem might be a resilience factor, unless the ecosystem has a small \_ or is fragmented (S)
- 18. A large flightless bird that play a niche role in the Wet Tropics of Australia; 37 plant species rely on this bird for seed dispersal (C)
- 19. This flows through ecosystems via food chains/ webs (E)
- 24. World cities attract TNC HQs due to the service firms they also host e.g. banking, advertising; these are also good to map connectivity and flows of information between cities (S)
- 25. Management by Indigenous peoples; often used today in modern management practices (T)
- 26. A name for people in Mumbai (and other cities) for people who sift through garbage looking for particular types of rubbish (RP)
- 27. The name for a slum in Brazil (F)
- **32.** World cities demonstrate this type of authority through hosting TNC HQs, the largest stock exchanges and banks (E)
- 34. You might catch this from polluted water in Mumbai (T)
- **35.** Indigenous people have a philosophy about ecosystem management; there to look after the land (S)
- **39.** A plant species which is drought tolerant (X)
- 40. The USA, France and Japan all have less than % of employment in the primary sector (T)
- **42.** The country with the highest percentage of employment in the primary sector (T)
- 44. Which group of countries would be considered developed?
- 45. Minnamurra Rainforest is in danger from this non-endemic invasive species; it is being cleared by volunteers (L)
- 47. This is not always collected in megacities sometime due to a lack of money to pay for this service; a sanitation issue (G)
- **48.** A slum in central Mumbai that is sitting on prime real estate; a solution is to redevelop and house only 10% of slum dwellers (D)
- **50.** Legislation or \_\_\_\_\_s are a current example of a traditional approach to ecosystem management that used rules about who could hunt a particular animal and what time of year (L)
- 53. World cities are home to most of the HQs of the world's major \_\_\_ \_\_; Tokyo has 17 of the top 100 e.g. Toyota (T)
- 54. A city which has is dominant in the Asia and West Pacific panregion; its trains are super on time (T)





#### ACROSS CLUES

- 1. The region where most cocoa is grown (W, A)
- **3.** These networks help move people and goods around the globe (T)
- 6. Many of the world's poor who also live in Megacities are living in \_\_\_\_\_, a lack of access to food, clothing and shelter (P)
- **9.** Many of Sydney's under employed workers have PT or casual work in \_\_\_\_\_(R)
- **11.** Strong culture of place with reds, yellows and Asian inspired architecture in this SW Sydney suburb (C)
- **12.** Limited \_\_\_\_\_\_ (size) and fragmentation can mean an ecosystem is vulnerable (E)
- 13. The Point found at a bearing 15 from Point B
- 14. A megacity found in Bangladesh (D)
- 15. The Point found 3.5km along the Trail from Point C
- 16. The Junee Licorice and Chocolate factory in Junee was once a flour \_\_\_\_\_\_ linked to the wheat growing region of the Riverina (M)
- 18. The Point found at a bearing of 64 from Point B
- **20.** The Point found at a direction ENE of Point E
- **22.** A summary map of atmospheric conditions at a particular point and location (S)
- **24.** A summary map of land use that gives a general sketch of an area (P)
- **26.** Run down, often old industrial areas suffer from this process (think economic restructuring) (U, D)
- **28.** World cities are control and command centres due to their \_\_\_\_\_authority, controlling flows of the world's money (E)
- **31.** The Point 5.5km from Point D
- **32.** Long term atmospheric averages (C)
- **34.** Vegetation community heading towards a climax in a progression (S)
- **35.** Process where people move out of a city but maintain links with the city (E)
- 37. The Point found 125 from Point A
- **39.** The country which hosts megacity Mumbai and has been affected by Monsoonal floods (I)
- **41.** Informal settlements found in megacities, known as favelas in Brazil (S)
- 43. VE of a cross section drawn between Point B and Point C vertical scale of 1:5000 (T)
- **44.** The number of essays you should write in your Geo HSC exam don't do three (T)
- **45.** Plants often need to attach oxygen to nitrogen before they can use this nutrient forms a \_\_\_\_\_(N)
- **48.** Monolith in Australia's centre; a tourist attraction (U)
- 50. Is there a sight line between Point A and Point C?
- **51.** An organisation that acts independent from any government (N)
- **52.** Is the stream flowing SW?
- **54.** \_\_\_\_\_ levels contain species that perform the same role in food chains e.g. producers, primary consumer (T)
- 57. Meeting the needs of the current generation, without compromising the future generation's ability to meet their needs (S)
- 60. Height about sea level (A)
- **62.** Does the land directly south of Point A have a gentle slope? Write your answer in Spanish
- **63.** VE of a cross section between Point C and Point E with a vertical scale of 1:2000 (F)
- 66. A map type showing ownership boundaries of land (C)
- **69.** Measurement of the steepness of a slope; formula Rise: Run. Syllabus asks to express it as a ratio (G)
- 70. Point A is this direction from Point C (N)

- 71. A book of maps (A)
- **72.** This terrorist group might scare people off going on holidays or visiting public spaces in well-known western cities (I)
- 74. The Point with a North Westerly aspect
- 75. The Point 7840 masl and NNE of Point B
- **76.** During the harvesting of agricultural products there is a \_\_\_\_\_\_ of nutrients from soils; in cocoa production the ratio is 3:1 of cocoa removed to the nutrients needed to be replaced for sustainable soils (L)
- **79.** The photo below was taken at Point A. What direction was the photographer facing?



- **80.** VE of a cross section drawn between Point F and Point D with a vertical scale of 1:20000 (F)
- 81. This type of diversity allows for a range of traits in a species which will mean it is resilient to changes (G)
- **83.** \_\_\_\_\_miles; the distance a product travels before consumption. Long miles = extra transport pollution and resource use (F)
- **84.** A photograph taken at an angle, usually from a raised position or from the air (O)
- **85.** The average gradient between Point A and Point E (8090m), 1:\_\_\_\_\_
- 86. The measurement by how much one axis of a graph or cross section has been altered from the other; a way to justify misleading graphs – vertical (E)

#### DOWN CLUES

- 1. \_\_\_\_\_Cities have global influence economically and culturally (W)
- 2. A suburb in SW Sydney that was facing Decay and now being Renewed (C)
- **3.** Given enough of this, ecosystems can generally recover naturally (T)
- The Yellow Crazy variety of this species is an invasive species in the Wet Tropics Rainforest (A)
- A vulnerable aquatic ecosystems due to narrow locational needs e.g. temp and salinity levels (R)
- Called a sector graph in maths, the edible version in Geo (P)
- 7. A Sydney suburb that changed land use from industrial to high density apartments on the Parramatta River (R)
- 8. Use of fertilisers in agricultural activities can improve \_\_\_\_\_(Y)
- **10.** Buying and selling goods and services; exports and imports (T)
- 17. The type of scale used on the map extract (L)
- **19.** The number that geographers love to see at the beginning of a map (ratio) scale (O)

- **21.** The lines joining places of equal air pressure on a synoptic chart \_\_\_\_\_bars (I)
- 22. A large city of the developed world in NSW, Australia (S)
- **23.** A corporation operating in more than one country (T)
- **24.** Rainforests have high levels of this over 2000mm, while deserts have less than 200mm (P)
- **25.** A megacity challenge; high rates lead to a feeling of not being safe, but is often caused due to desperation (C)
- **27.** A global economic agricultural product grown in rainforest conditions and eaten mainly in westernised places (C)
- **29.** \_\_\_\_\_ linkages and flows within a business are controlled by the business managers (I)
- **30.** Food webs and chains demonstrate \_\_\_\_\_ between organisms in an ecosystem; more = resilient (L)
- 33. Flows through an ecosystem (E)
- **36.** This is often not up to meeting the needs of rapidly growing populations in developing countries e.g. road, rail, public services (I)
- **38.** People who shift through garbage to find materials to sell or reuse \_\_\_\_\_ pickers (R)
- 40. Vertical exaggeration of a cross section drawn between Point A and Point D with a vertical scale of 1:10000 (T)
- **41.** The movement of women into the cocoa industry as leaders in farming regions is an example of this factor (S)
- 42. It is important to \_\_\_\_\_\_ and protect ecosystems; there are 5 syllabus identified reasons to back up that statement (M)
- **46.** Factor causing change in global economic activities e.g. cocoa with increased mechanisation (T)
- **47.** Traditional management practices included the use of a \_\_\_\_\_\_- animal protected by a clan or individual (T)
- **49.** Factor affecting the nature, location and future directions of economic activities which includes rain, temperature and soils etc (B)
- 51. These link world cities together and demonstrate flows of goods, ideas, money, people and services (N)
- **53.** There is often a low mobility of \_\_\_\_\_ in developing countries, however, people are often very resourceful (L)
- **55.** \_\_\_\_\_\_ value of ecosystems can mean protecting species which are relicts from long ago (H)

- 56. Erecting fences on coastal dunes is an exclusion practice designed to \_\_\_\_\_\_ further damage to dunes and ensure intergenerational equity by preserving the ecosystem (S)
- **57.** When people in megacities do not wait for government assistance they engage in\_\_\_\_\_\_ schemes (S, H)
- **58.** Ecological \_\_\_\_\_\_ the replacement of one vegetation community with another (S)
- 59. Really dry; less than 250mm of rainfall (A)
- **61.** A \_\_\_\_\_\_ graphic map shows the shape and height of the land using contour lines (T)
- **64.** Over 80% of this material is recycled in Mumbai due to the work of slum dwellers (P)
- **65.** When a new species enters an ecosystem and (out) competes with established species (I)
- **67.** Natural change in ecosystems of often gradual giving species time to \_\_\_\_\_\_ (A)
- **68.** Time taken to travel along the Trail from Point B to Point C at a speed of 7km/h in minutes (T)
- **69.** Sites in a city/urban area which have not been previously developed \_\_\_\_\_\_field (G)
- **70.** Point A is this direction from Point D. Write the abbreviated answer (N)
- **73.** Used to educate people about rules/laws on the purposes of rehabilitation in an excluded area often ignored (S)
- **77.** Can and should you take into your HSC Geography exam the following items?
  - A ruler
  - Protractor
  - Compasses
  - Pens
  - Coloured pencils
  - A pair of dividersA small magnifying glass
  - A small magnifying git
     String
  - A board approved calculator
- **78.** Megacities, World cities, large cities, regional centres and small town are all examples of what type of places?
- **82.** Some argue that the loss of this species will mean the end of live on earth (B)

Shared by David Proctor for Geography Bulletin Edition 52, No 3



# **BIOPHYSICAL INTERACTIONS: EXPLORING THE CRYOSPHERE**

# **KWNR CHART**

\* KNOW; WANT to know; NEED to know (Syllabus); REFLECT – what was learned?



See Geography Bulletin Edition 52, No 3, page 35

#### **BIOPHYSICAL INTERACTIONS: EXPLORING THE CRYOSPHERE**

# Activity 1: What is the cryosphere mind map

Mind map the features and characteristics of the cryosphere.



# Activity 2a. World map 1



Source: https://www.freeworldmaps.net/pdf/maps.html

See Geography Bulletin Edition 52, No 3, page 38

# Activity 2b. World map 2



MAP SCORE – Peer evaluation / 20 Marks

# Activity 2c. Describe the global distribution of the cryosphere

After a class discussion about the spatial patterns of the cryosphere write a short paragraph describing the global distribution of the cryosphere. Use geographical language such as poles, equator, continents, mountain ranges, oceans, hemisphere and a paragraph structure promoted by your school eg PEEL

# Activity 3: Explain the global distribution of the cryosphere

Write a detailed paragraph to explain the global distribution of the cryosphere.

Use geographical concepts e.g. climate, latitude, altitude, insolation, atmosphere language such as poles, equator, continents, mountain ranges, oceans, hemisphere and a paragraph structure promoted by your school eg PEEL.

# Activity 4: Test you recall – STOP THE BUS

After completing an **investigative study** of the *cryosphere* your recall of key information will be tested test in this activity called STOP THE BUS.

#### Organisation

- Each student / pair of students completes the worksheet until STOP THE BUS is called.
- Teacher is the umpire if there is disagreement.

#### Instructions

- The aim of this activity is to provide 4 facts or ideas in response to each question.
- Bonus marks are given for correct information not given by other students
- Bonus marks are given for attempting the challenge questions
- The first person to fill in 5 relevant responses to each question calls "STOP THE BUS" and all students STOP WRITING.

#### Scoring

- 3 marks for bonus questions
- 2 marks for an answer no one else has
- 1 mark for a correct answer
- 0 marks for an incorrect answer.

# CRYOSPHERE: TEST YOUR RECALL – STOP THE BUS



Question	1.	2.	3.	4.	Score
Name four features of the cryosphere.					
Describe the location of the cryosphere at a global scale.					
Explain the location of the cryosphere at a global scale.					
How important is the cryosphere to the hydrosphere and atmosphere?					
What is the relationship between the cryosphere and the biosphere?					
What changes are affecting the cryosphere at a global scale?					
Provide evidence of change in the cryosphere at a national scale.					
Challenge. Four additional cryosphere facts.					

See Geography Bulletin Edition 52, No 3, page 42

# **EVALUATING INFORMATION SOURCES: CRAP CHECKLIST**

Prove that your information sources are not CRAP!

Write notes after each question and circle the yes/no questions.

#### The more "Yes" answers you get, the better your website!

Website: \_\_\_\_\_\_URL: \_\_\_\_\_

<b>Currency</b> How old is the information?	Is it a science or technology-based document? Does it cover current events? If so, it needs to be very current. If it is a humanities or historical document, these documents can be decades old and still relevant. When was this site last updated? What date can you find?	x	х
	Is it current enough for your project?	Yes	No
Reliability	Who is sponsoring this publication?	X	Х
Is this information accurate? What is	Does the information come from a school or government organisation? (.edu, .gov and sometimes .org—non-profit)	Yes	No
the origin of the information?	Why do you trust this source? Why, or why not?	Yes	No
Authority	Is there a specific author listed on the website?	Yes	No
Who is behind the	What knowledge or skill does this author have in the topic area?	Х	Х
information?	Is the author's email address, contact information, included?	Yes	No
	Is the information from a known and trusted organisation?	Yes	No
	Is there a bibliography given citing the website sources used?	Yes	No
	Do links go to other reliable information?	Yes	No
Purpose	Does the website seek to inform you and present various sides of an argument or issue?	Yes	No
What is the motive of the site?	Is the information in neutral language? Is it <b>free of</b> bias (clearly one- sided opinion), and <b>not</b> trying to sell you something?	Yes	No

Adapted by L Chaffer from various sources

See Geography Bulletin Edition 52, No 3, page 40

For more https://www.teachermagazine.com.au/articles/critical-thinking-tools-the-crap-test

# **EVALUATING INFORMATION SOURCES: CRAAP TEST**

# **Evaluating Web Sites using The CRAAP Test**

Web Site:	YES	Web Site:	YES
Currency		Currency	
<ul> <li>Is the information up-to-date for your topic?</li> </ul>		<ul> <li>Is the information up-to-date for your topic?</li> </ul>	
Relevance		Relevance	
<ul> <li>Does the information relate to your topic?</li> </ul>		<ul> <li>Does the information relate to your topic?</li> </ul>	
<ul> <li>Is it at a good reading level for you? Do you understand the words?</li> </ul>		<ul> <li>Is it at a good reading level for you? Do you understand the words?</li> </ul>	
Authority		Authority	
<ul> <li>Is the author qualified to write about the topic? The author can be a person or an organization.</li> </ul>		<ul> <li>Is the author qualified to write about the topic? The author can be a person or an organization.</li> </ul>	
Look at the URL: What does it tell you about the author/source?		Look at the URL: What does it tell you about the author/source?	
No? <sup>STOP</sup> It is not reliable.		No? The source of the second s	
Accuracy		Accuracy	
<ul> <li>Does the writing and/or language seem unbiased? Facts instead of opinions.</li> </ul>		<ul> <li>Does the writing and/or language seem unbiased? Facts instead of opinions.</li> </ul>	
<ul> <li>Are there no grammatical or spelling mistakes?</li> </ul>		Are there no grammatical or spelling mistakes?	
Purpose		Purpose	
<ul> <li>Is the reason for the site to inform or teach? (Not to sell, entertain, or persuade)</li> </ul>		<ul> <li>Is the reason for the site to inform or teach? (Not to sell, entertain, or persuade)</li> </ul>	
Total number of checks		Total number of checks	
Is this site credible? You need at least 5 checks.		Is this site credible? You need at least 5 checks.	

Retrieved by L Chaffer from https://ihs-ipsk12.libguides.com/ld.php?content\_id=8096963 See Geography Bulletin Edition 52, No 3, page 40 For more https://www.teachermagazine.com.au/articles/critical-thinking-tools-the-crap-test

#### **BIOPHYSICAL INTERACTIONS: EXPLORING THE CRYOSPHERE**

# **FUTURES WHEEL**

Use a futures wheel or consequence chart template or and interactive digital version



Retrieved from Global Education https://www.globaleducation.edu.au/resources-gallery/resource-gallery-templates.html

# SAMPLE DIGITAL TEMPLATE



#### Retrieved from

https://online.visual-paradigm.com/diagrams/templates/futures-wheel/futures-wheel-diagram-template/ See Geography Bulletin Edition 52, No 3, page 41

# **RESOURCE LIST FOR INVESTIGATING THE CRYOSOHERE**

#### **Cryosphere features and characteristics**

- Global Cryosphere Watch. World Meteorological Association – https://globalcryospherewatch.org/ about/cryosphere.html
- USGS: Ice, snow and glaciers and the water cycle https://www.usgs.gov/special-topic/waterscience-school/science/ice-snow-and-glaciersand-water-cycle?qt-science\_center\_objects=0#qtscience\_center\_objects
- World tour of the cryosphere connections https://www.youtube.com/watch?v=ZQTVF29Skmw
- What is the global volume of land ice and how is it changing? – http://www.antarcticglaciers.org/ glaciers-and-climate/what-is-the-global-volumeof-land-ice-and-how-is-it-changing
- Frozen Life https://askabiologist.asu.edu/explore/ frozen-life

#### **Changing cryosphere**

- IPCC Special Report on the Ocean and Cryosphere in a Changing Climate – https://www.ipcc.ch/srocc/
- Visualisation: Arctic sea ice change –\_https:// climate.nasa.gov/climate\_resources/155/videoannual-arctic-sea-ice-minimum-1979-2019-witharea-graph/
- NASA Earth minute videos https://climate.nasa. gov/climate\_resource\_center/earthminute
- Glacial and interglacial cycles: Explanations and videos – http://sites.gsu.edu/geog1112/lab-7/
- Time-Lapse Images of Retreating Glaciers https://www.livescience.com/58774-time-lapsephotos-show-retreating-glaciers.html
- Doomsday glacier https://www.livescience.com/ underwater-robot-visits-antarctica-glacier.html
- Video: If all Earth's ice melted https://www. youtube.com/watch?v=VbiRNT\_gWUQ
- Patagonia ice sheet \_http://www. antarcticglaciers.org/glacial-geology/patagonianice-sheet/patice/pis-reconstruction-5ka-present/
- GIF: Recession of glaciers and ice-dammed lakes from 35,000 years ago – http://www. antarcticglaciers.org/glacial-geology/patagonianice-sheet/patice/patice\_2020\_02\_28\_1000-2/
- Melting Glaciers Mean Double Trouble for Water Supplies – https://www.nationalgeographic.com/ news/2011/12/1112-melting-glaciers-meandouble-trouble-for-water-supplies/

- The world's mountain 'water towers' are melting, putting 1.9 billion people at risk – https:// theconversation.com/the-worlds-mountain-watertowers-are-melting-putting-1-9-billion-people-atrisk-128501
- New research shows that as ice disappears, overall evaporation speeds up – https://www. nationalgeographic.com/news/2011/12/1112melting-glaciers-mean-double-trouble-for-watersupplies/
- Greenland has lost 3.8 trillion tonnes of ice since 1992 – https://theconversation.com/ greenland-has-lost-3-8-trillion-tonnes-of-icesince-1992-127752
- Amazon fires are causing glaciers in the Andes to melt even faster – https://theconversation.com/ amazon-fires-are-causing-glaciers-in-the-andes-tomelt-even-faster-128023
- New Zealand's Southern Alps glacier melt has doubled – https://www.sciencedaily.com/ releases/2020/08/200807093750.htm

#### Atmosphere

- Miracle in a storm –\_https://www.youtube.com/ watch?v=YTEoD2j4xdQ https://www.youtube.com/watch?v=vs7I5R7ikP4
- Ewa sucked into storm and lives to tell https:// www.smh.com.au/national/ewa-sucked-intostorm-and-lives-to-tell-20070217-gdphms.html

#### YouTube programs

 Miracle in a storm – https://www.youtube.com/ watch?v=YTEoD2j4xdQ https://www.youtube.com/watch?v=vs7I5R7ikP4

#### Lithosphere

 Diving between plates: YouTube Diving Silfra fissure – https://www.youtube.com/ watch?v=tliU5A8m7Lg

#### **Biosphere**

- Biodiversity hotspot: Madagascar https://www. youtube.com/watch?v=cTNnkbKoxgw
- WWF: Madagascar https://www.worldwildlife. org/places/madagascar
- Madagascar's Precious Wildlife Is Slipping Away, Madagascar - BBC Two – https://www.youtube. com/watch?v=FPdpStD0808

See Geography Bulletin Edition 52, No 3

Complete the table with additional examples of interactions between the cryosphere and other components of Earth's biophysical systems. List any issues in the last column

Interactions between cryosphere, hydrosphere, atmosphere, biosphere and lithosphere

Components	Interactions	Your examples	Issues
Cryosphere	Glacier meltwater and runoff contributes to water flows, affecting freshwater availability for irrigation, hydropower, and ecosystems. The runoff is seasonal, with a minimum in the snow- accumulation season, and a maximum in the melt season.		
Cryosphere	The cryosphere plays an important role in the Earth's climate. Snow and ice reflect heat from the sun, helping to regulate Earth's temperature. The cryosphere is one of the first places that scientist study to identify global changes in climate.		
Cryosphere Biosphere	lce provides a habitat for animals and plants and supports marine and terrestrial ecosystems such the arctic ocean, tundra and mountain ecosystems. People		
Cryosphere	Glaciers transport material as they move and sculpt land into distinctive landforms. A glacier's weight and gradual movement reshape landscapes over time. Permafrost frozen ground, soil, sediment, or rock up to 1,000 metres thick that remains at or below 0°C for at least two years. Some permafrost thaws seasonally releasing water into the environment.		

See Geography Bulletin Edition 52, No 3, page 41

# **BIOPHYSICAL INTERACTIONS: HYDROSPHERE RECALL ACTIVITY**

# A. Transfer of water through the hydrological cycle

Using your recall (or guestimate) match the labels below with the letters on the diagram. Name the process and location of the transfer.



Water transferred through the water cycle	Letter	Water cycle process and transfer location
40,000 km <sup>3</sup>		
40,000 km <sup>3</sup>		
70,000 km <sup>3</sup>		
110,000 km <sup>3</sup>		
390,000 km <sup>3</sup>		
430,000 km <sup>3</sup>		

# **B.** Open and closed systems

Watch 'Gorongosa's Water Cycle at https://www.youtube.com/watch?v=7PD\_UIxF07c Explain each of the following statements:

On a global scale the water cycle is a closed system

See Geography Bulletin Edition 52, No 3, page 42

# **BIOPHYSICAL INTERACTIONS: ATMOSPHERE RECALL ACTIVITY**

#### "MIRACLE IN THE STORM"

https://www.telegraph.co.uk/news/worldnews/1542962/Paraglider-survived-in-storm-at-32000-ft.html https://www.smh.com.au/national/ewa-sucked-into-storm-and-lives-to-tell-20070217-gdphms.html

1. Describe where the event occurred including **geographical location** and **topography** (landforms / lithosphere)

A S S S S	
AUSTRALIA	
NSW 🗆 Manilla 🗆 Sydney	Why is this location suited to paragliding?
The second se	

2. Briefly describe what happened to Ewa using geographical / scientific terminology

32,000ft Ewa reaches this height in 15 minutes and	
from her launch point	
30,000ft	
29,035ft	
Summit of Everest	
Height at which geese fly	
24,000ft	
Previous altitude survival	
20,000ft	
Ewa loses consciousness due to lack of oxygen, temperature plummets	
to -58°F, she is pounded with hailstones the size of oranges	
and ice encases	
3.000ft	What layer of the atmosphere is involved?
Frostbite to exposed skin	what layer of the atmosphere is involved?
2,500ft Violent thunderstorm	
strikes, whisking Ewa up	
The rise and fall of Ewa Wisnerska	

3a. List **features of the atmosphere** described during the video on YouTube at https://www.youtube.com/ watch?v=YTEoD2j4xdQ or https://www.youtube.com/watch?v=vs7I5R7ikP4

#### b. At what heights do most weather events take place? Give examples

4. Study the diagrams of thunderstorm formation below and use your knowledge of the hydrological (water) cycle to answer the following questions.



Source: NOAA National Weather Service

a. List processes of the hydrosphere and atmosphere relevant to this event. Use appropriate geographical concepts in your answer.

b. Explain how the Atmosphere, Hydrosphere and cryosphere were linked in what happened.

In the space below explain ONE weather event you recall. Select from cold front, tropical cyclone, East Coast Low OR orographic rainfall.

See Geography Bulletin Edition 52, No 3, page 44.

**RISK and REWARD: BIOSPHERE RECALL ACTIVITY** 

BRONZE	SILVER	GOLD
What is the biosphere?	Name as many different biomes (at a global scale) as you can.	How does an ecosystem differ from a biome?
Define biodiversity	Define primary biomass - include an example in your answer.	Differentiate between ecosystem, species and genetic biodiversity.
How does climate influence the biosphere?	State two links between the biosphere and the hydrosphere.	Name one biome and explain links between the living and non-living components.
State one way the lithosphere influences biodiversity	How does latitude influence the location of the biomes that make up Earth's biosphere?	How are biomes in low latitudes different from biomes in high latitudes?
What is a biome / ecosystem food chain?	What is a food eb and how does it differ from a food chain?	What is a food pyramid and how does it duffer from a food web?
What is meant by the term 'productivity' when talking about the biosphere?	Why is Earth's primary productivity important?	How does the productivity of biomes change with the seasons?
Where is primary productivity shown on food pyramids and in food chains?	Name two terrestrial and two aquatic biomes or ecosystems.	Which are the most productive biomes, Terrestrial or aquatic. Explain.
State one way that climate change can impact on the biosphere	State two ways that climate change can impact on the biosphere	State three ways that climate change can impact on the biosphere.
What is happening to global biodiversity?	State two of the main threats to global biodiversity.	Outline what is being done to protect one species of plant or animal in Australia.
State one way that satellite images can be used to used to monitor the biosphere	State one way that satellite images can be used to monitor the biodiversity.	Explain two ways technology is helping to protect and conserve global biodiversity.
<ul> <li>Risk and reward</li> <li>You will be randomly selected to pick a c</li> <li>If you improve someone's answer, you gc</li> <li>Today's rewards will be:</li> </ul>	question to answer, if the class they cannot improve yo et a reward.	our answer – you get the reward.

See Geography Bulletin Edition 52, No 3, page 44.

# BIOPHYSICAL INTERACTIONS: LITHOSPHERE RECALL ACTIVITY

	Tectonic plate movement can cause volcanic eruptions, beach erosion and tidal waves.	Australia sits across the boundary of two tectonic plates.	Fluvial landscapes are formed and shaped by the action of ice.	Fix the mind map	Cave River floodplain River diver floodplain River created by glacter Desert dunes Mushroom
	A natural hazard is a disaster caused by nature.	New crust is formed where two tectonic plates collide (Convergent boundaries) and form mountains.	The Mid Pacific Ridge, East Asia Rift Valley and Australian Alps are all landforms on tectonic plate boundaries.	Fix the flow chart	Tectonic plates separate Plates get stuck Tension builds Plates move suddenly Volcanic eruption
	Geomorphic processes are natural and human ways by which landscapes and environments change.	Earth's tectonic plates move in two directions – towards each other or away from each other.	Beaches and river valleys are formed by the process of deposition.	Fix the diagram	Rift valley lava Divergent plate boundary
of NSW a Aut not.	A landscape is a natural environment containing landforms, vegetation and wildlife.	Tectonic plates are sections of Earth's crust that float on water and are moved by ocean currents.	Erosion is a geomorphic process during which rocks react to air and water and break apart.	Fix the map	The second secon

**Instructions:** Find the mistake (s) in each statement. Write the item(s) in the space below. Cross out incorrect labelling on images and replace with corrected text or arrows. Created by Lorraine Chaffer for GTANSW & ACT Bulletin 3, 2020 Adapted from Twitter See Geography Bulletin Edition 52, No 3, pages 43 – 44.

It's wrong: Can you fix it?

# **ECOSYSTEMS AT RISK**

# **GREAT BARRIER REEF: CORAL BLEACHING**

Watch the Catalyst program https://www.abc.net.au/catalyst/coral-bleaching/11016946#:~:text=Early%20 in%202016%2C%20high%20sea,effort%20to%20map%20what%20happened.&text=We%20 flew%20over%20nearly%201%2C200,of%20the%20Great%20Barrier%20Reef

# **Ecosystem functioning: biophysical processes**

A\_\_\_\_\_, p\_\_\_\_\_ or m\_\_\_\_\_?

- Coral is a mix of all three an upside down jellyfish called a p\_\_\_\_\_\_ that embeds plant cells in its flesh and builds solar power cities from limestone.
- To survive, coral needs a key partner, a \_\_\_\_\_\_. Microscopic single-cell algae of the genus Symbiodinium. Coral takes the algae from the water to live symbiotically inside its own cells. That's how the polyp gets its colour. It's a positive relationship the algae, or symbionts, receive s \_\_\_\_\_\_ and carbon dioxide from their host. In return, the coral obtains most of its nutrition from s \_\_\_\_\_\_ that the algae make through photosynthesis. But there's a catch this solar-powered partnership depends on temperature to work.
- So, what happens when water warms up? Over a week, QUT researcher Brett Lewis increased the water temperature by 4 degrees, to peak at 32 degrees Celsius.
- Mushroom corals a large solitary type that don't build reefs, expelled their algal symbionts with repeated convulsions, known as pulsed i\_\_\_\_\_\_. Some of the largest expansions seen were 3\_\_\_\_\_% the size of the actual original tissue.
- As clouds of algae are pumped into the water, the coral loses its c\_\_\_\_\_ and becomes pale. Corals are known for doing this to get rid of s\_\_\_\_\_, but to get rid of algae in this way has not been seen before.
- That's the reaction of just one coral in a lab. This is what happens on the scale of a reef. Early in 2016, high sea temperatures over many weeks caused mass bleaching in parts of the Great Barrier Reef.
- \_\_\_\_% plus of the GBR's corals bleached, because when that level of bleaching occurs, you're looking at \_\_\_\_% or more mortality.
- Bleaching doesn't usually kill them outright but if the algae aren't replaced, the coral slowly s\_\_\_\_\_\_. When healthy, each square centimetre of coral tissue is packed with around \_\_\_\_\_ million algal cells.
- In previous bleaching events, they've seen algal symbionts reduce to about \_\_\_\_\_\_ a tenfold decrease.
   This time in samples from the northern reefs, they found barely any left at all.

#### When bleaching happens, what's going on inside the coral?

- The algae actually go into hyperdrive, to some extent. So with all that heat, all that \_\_\_\_\_\_, they become overreactive and therefore the coral doesn't like that so they essentially just \_\_\_\_\_\_ them out of their tissues.
- Above \_\_\_\_\_\_ degrees, the algae start to lose their ability to convert solar energy. That energy has to go somewhere and ends up creating reactive forms of o\_\_\_\_\_\_n, like peroxide and bleach, inside the coral cells. The very light a coral need for growth becomes poisonous.
- 6 months, 12 months down the track, higher levels of d\_\_\_\_\_e can occur.
   Once the health of the coral is compromised, bacteria and other microbes cause \_\_\_\_\_
- This lesion will move up to \_\_\_\_\_mm to \_\_\_\_\_mm a day. In some areas, it can be seen to move centimetres a day. And so some corals that have been infected with these lesions will be dead within weeks.
- For corals to recover, they don't just have to take up their symbionts again, they have to repair their t\_\_\_\_\_, they have to fight off these i\_\_\_\_\_ and then they have to select that one microbe that they need to survive.
- Some corals didn't die slowly of starvation because they'd lost the symbiont, they actually cooked over a period of just a week or two because the temperatures in the northern Barrier Reef were so extreme. The average sea surface temperatures in summer 2015-2016 were the highest ever recorded.
- This year, we saw some locations well over \_\_\_\_\_ degrees Celsius warmer than they would usually experience in the hottest time of year.

#### **GREAT BARRIER REEF: CORAL BLEACHING**

- It takes 10 to \_\_\_\_\_\_ years for the fastest-growing corals to bounce back after a severe disturbance, like a bleaching event or a cyclone.
- Severe Tropical Cyclone \_\_\_\_\_\_ was the strongest to hit the South Pacific in recorded history. When it struck Fiji in February 2016, it came eventually to the coast of Queensland as a \_\_\_\_\_\_ depression and it sat around the bottom half of the Great Barrier Reef for a period of several weeks. It brought the temperature down by about \_\_\_\_\_\_ degrees centigrade. So the Barrier Reef was saved, the southern half, by the vagaries of that cyclone coming along.
- We now know that Symbiodinium has a broad range of g\_\_\_\_\_\_ diversity, in fact as many as 400-500 species. In fact, the deeper we go into the genetic variation, the more variability we find.
- The question is, will this genetic diversity be able to match the challenges of environmental change?
- To what extent can corals save themselves by selecting new symbionts, new solar panels if the old ones aren't up to scratch?
- There's emerging evidence that if they survive a bleaching event, some adult corals can then switch their algal s\_\_\_\_\_\_ to a tougher species.

#### PARAGRAPH

Bring all of the information together to write an **essay paragraph** on coral bleaching.

#### Sample essay question: Analyse ONE human impact on an ecosystem at risk

- Analyse = explore relationships and explain the implications (effects). Key phrases include "implications", "meaning", "resulting in", "event x has a relationship with event y", "leading to ", "as a consequence". For this question, the relationships will be between the spheres.
- **Impact** = short-and -long term consequences of an event.
- Human impact = changes induced by people, such as global warming and associated coral bleaching.

In the space below, write a paragraph about the impacts of coral bleaching that addresses the above question. Your paragraph must follow the TEEL structure and include at least five of these technical geography terms: Bleaching, Symbiodinium, symbionts, zooxanthellae, photosynthesis, pulsed inflation, natural stress, tropical cyclone, rain depression, genetic diversity, geomorphological/lithosphere, limestone exoskeleton, atmosphere, hydrological/hydrosphere, biogeographical/biosphere, Drupella, mushroom coral, instant mortality, turfing algae, resilience, vulnerability, elasticity.

Shared by Justin Mahoney in Geography Bulletin Edition 52, No 3, page 58

# **ECONOMIC ACTIVITY: IMPACTS OF COVID-19**

## **ACTIVITY 1: Is your Economic Activity a winner or loser?**

#### Study Source A: 'DECODING THE ECONOMICS OF COVID-19'

- a. Identify the area of production in which your economic activity falls.
- b. Do you agree that your activity is correctly categorised as a short-term winner OR loser in the COVID-19 pandemic? Justify your answer.

c. Choose ONE potential winner and ONE potential loser (not your own activity) and suggest how COVID-19 would have positively or negatively impacted that activity.

Extension: Research evidence or provide anecdotal evidence to support your suggestion. SOURCE A



Shared by Lorraine Chaffer for Geography Bulletin Edition 52, No 3, page 62

#### **ECONOMIC ACTIVITY: IMPACTS OF COVID-19**

# ACTIVITY 2: How has Covid-19 impacted activities globally?

- a. Beside each image in SOURCE B put the letters EC (Economic), EN (Environmental) or S (Social) to identify the impacts of COVID-19.
- b. Select 4 of impacts on the infographic that are relevant to the global economic activity you studied and that you can elaborate on in the text boxes.
- c. Create a consequence diagram or flow chart to illustrate how one impact has a flow on effect for an economic activity.

Impact 1		

Impact 2

#### **SOURCE B**



# Consequence diagram or flow chart

# ACTIVITY 3: How has Covid-19 impacted your Economic Activity and enterprise?

Refer to Sources D, E and F in Geography Bulletin Edition 52, No 3 pages 64–67

- a. In Column 1 list potential impacts of Covid-19 on economic activities
- b. In Column 2 outline if and how each impact has affected the economic activity you studied
- c. In Column 3 outline if and how each impact has affected your economic enterprise.

ІМРАСТ	Impact on	Impact on
	(your economic activity)	(your economic enterprise)

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#### **ECONOMIC ACTIVITY: IMPACTS OF COVID-19**

# **ACTIVITY 4: Chains of reasoning**

Create 'chains of reasoning' to illustrate the consequences of TWO impacts of COVID 19 on your economic enterprise. See sample in Geography Bulletin Edition 52, No 3 Page 42.

# 

IMPACT 2 .....



Created by Lorraine Chaffer for Geography Bulletin Edition 52, No 3

# **STAGE 6 SKILLS**

# **ECONOMIC ACTIVITY: TOURISM**

#### **SOURCE A:**

- i. Complete a PQE for the column graph on the infographic. (Bulletin Page 107)
- ii. Investigate tourist numbers for the following quarters in 2020 to identify ongoing trends.
- iii. Explain the most positive projection illustrated on the line graph. What do the different projections of tourist arrivals mean for tourism as an export industry.

#### **SOURCE B:**

- i. Calculate total emissions from ships and cars in the following port cities
  - Barcelona
  - Copenhagen
- ii. Calculate the % of emissions that come from cruise ships in both cities
- iii. Calculate the ports in Spain as a % of the 15 'most polluting ports'
- iv. Locate these Spanish ports on a map (Google Earth or Atlas). Explain why cruises are a popular in this location.
- v. Investigate efforts made to improve the sustainability of the cruise industry

# **ECOSYSTEMS AT RISK: GREAT BARRIER REEF**

#### SOURCE C:

- i. After analysing the infographic and reading the text
  - Name components of the biophysical environment linked in this story.
  - Create a flow chart to show a sequence of events
  - Identify the relevant Ecosystems at Risk syllabus dot point
- ii. Write a short statement that you could incorporate into an extended response question as an illustrative example for the Ecosystems at Risk dot point.
- iii. Add a source to your illustrative example that would show an examiner that you are using contemporary sources that go beyond your textbook.
- iv. Create a chain of reasoning to explain one consequence of the volcanic event for aquatic ecosystems such as coral reefs (See chain of reasoning template in the Edition 3 Supplement.

# **CHALLENGES OF MEGA CITIES**

#### SOURCE D and SOURCE E:

- i. Describe the location of the following places. Refer to distance, area, direction and proximity to other places.
  - Mumbai
  - Dharavi within Mumbai.
  - Hotspots within Dharavi
- ii. Identify the map with the largest scale.
- iii. Draw a large-scale sketch map and a small-scale sketch map that could be incorporated into an extended response. Add annotations to the large scale map relevant to the concept of 'challenges' facing mega cities.
- iv. Identify features of Dharavi and challenges facing the megacity of Mumbai that impacted on the spread of the COVID-19 in the slum?
- v. Why was contact tracing not a viable response to dealing with the virus outbreak?

#### **STAGE 6 SKILLS**

- vi. Identify the strategies used to deal with the outbreak in Dharavi and why were these successful?
- vii. Write a paragraph about Dharavi that you could use when answering a question about challenges and responses facing megacities. Include reference to your source in your topic sentence.
- viii. Investigate redevelopment plans for Dharavi, including a statement about why progress has been very slow.

#### SOURCES F and G:

Read the tourist story and examine the images in the photo story.

Make brief notes under the following headings. Include information from sources D and E where relevant.

- The central location of Dharavi
- A working sum
- Contribution to Mumbai's economy and environment.
- Redevelopment plans
- Human wellbeing

# **BIOPHYSICAL INTERACTIONS: THE CRYOSPHERE**

#### Refer to SOURCE H, I and J:

- i. Complete a PQE for the graph line graph in Source I. (Bulletin Page 107)
- ii. Calculate the total weight of ice loss in 2000 and 2015.
- iii. Calculate the % change in ice loss between 2000 and 2015.
- iv. Define 'grounded ice' and 'floating ice' using your understanding of the cryosphere.
- v. Why is the loss of grounded ice seen as a greater threat than the loss of floating ice?
- vi. Describe the impacts of ice losses on glaciers with specific reference O Sources H and J
- vii. Explain the processes contributing to changes in Thwaite glacier.
- viii. Explain why Thwaite Glacier is called the "doomsday glacier"
- ix. Identify similarities between Mont Blanc glacier and Thwaite glacier.
- x. Identify differences between Mont Blanc glacier and Thwaite glacier. Are these differences significant?
- xi. Explain the connection between Source I and Sources H and J



