

**Year 9-10 Geography**

A picture containing shape

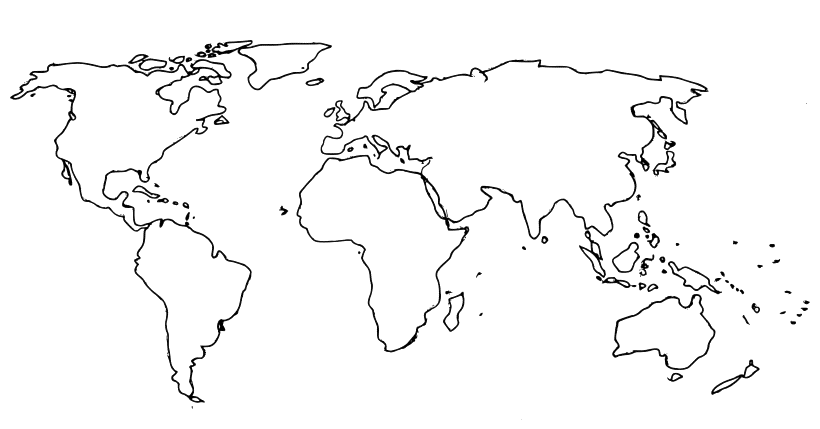
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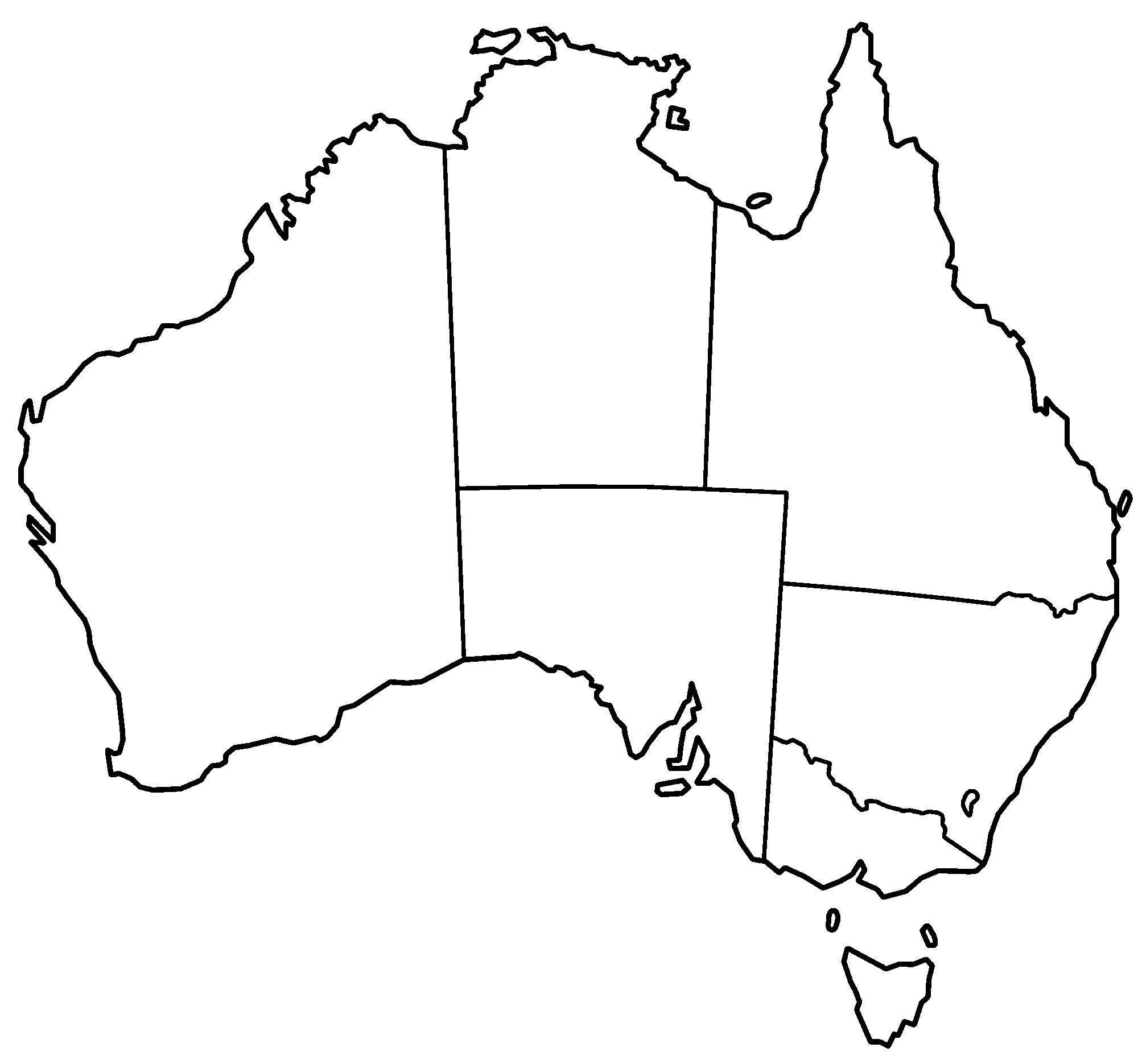
**Extension Booklet**

Biomes & Food Security

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part 1: Biomes

1. On the maps below, use coloured pencils to show the location of the major biomes on the earth, and then a more detailed map of Australia’s biomes. Don’t forget to create a key for each.



Diagram

Description automatically generatedPart 2: Ecosystems

1. On the diagram on the left, label the four spheres of the earth.
2. Explain the difference between a biome and an ecosystem.
3. What is the biggest factor that influences ecosystems?
4. What type of climate creates the most productive biomes?
5. Draw a simple model of an ecosystem in the space below, using arrows to show the movement of energy and nutrients.
6. Explain why seasonal rainfall (wet and dry seasons) creates the best conditions for soil fertility.
7. Rank the major biomes in terms of which ones are able to produce the most useful resources for humans.

Lowest Highest

1. Draw a line from these Woolworths items to their country of origin. (You will need to look them up online to find the product information).













Chart, funnel chart

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Part 3: Human Impact

1. Create a table showing the differences between natural and agricultural ecosystems:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | What’s put into it? | What’s produced? | How are nutrients recycled? | How are populations controlled? |
| Natural  Natural |  |  |  |  |
| Agricultural  Agricultural |  |  |  |  |

1. **Watch the video, 'Biomes that produce our Food, industrial material and fibres’ (on haiku)**
2. List all the foods and fibres produced.
3. Describe the climatic characteristics that are needed to produce these foods and fibres.
4. How are farmers trying to be more sustainable?
5. In the table below, mark which spheres are affected by the following food production activities:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **How Food Productions Affects the Four Spheres** | | | | |
| **Activity** | Icon  Description automatically generated with low confidence | Icon  Description automatically generated | A picture containing text  Description automatically generated | Icon  Description automatically generated |
| Clearing of native vegetation for agriculture |  |  |  |  |
| Overgrazing animals |  |  |  |  |
| Overusing irrigation water, causing saline soils |  |  |  |  |
| Burning forests to clear land for cultivation |  |  |  |  |
| Run-off of pesticides and fertilisers into streams |  |  |  |  |
| Producing greenhouse gases by grazing animals and rice farming |  |  |  |  |
| Changing from native vegetation to cropping |  |  |  |  |
| Withdrawing water from rivers and lakes for irrigation |  |  |  |  |
| Overcropping soils |  |  |  |  |
| Overfishing some species |  |  |  |  |
| Farming on marginal land |  |  |  |  |

1. **Watch the video ‘Animal Agriculture – Environmental Impacts’ (on haiku)**
2. List some of the consequences that animal agriculture has on our planet

1. Write a short paragraph about the ethics of eating meat. Consider the following: Does knowing the consequences make you want to choose to eat less meat? Do you think people would eat less meat if they were more aware of the impact? Why or why not?

Part 4: Food Security

Look at the graph in ***Figure 1*** above.

* 1. Which group and gender have the highest food insecurity?
  2. Suggest a possible reason for this:

**Figure 1.** Source: U.S. Department of Agriculture, Economic Research Service

**Percentage of Population Undernourished, by Year**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2005 | 2010 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| World | 12.4 | 9.2 | 8.3 | 8.3 | 8.1 | 8.3 | 8.4 | 9.9 |
| Africa | 21.3 | 18.0 | 16.9 | 17.5 | 17.1 | 17.8 | 18.0 | 21.0 |
| Asia | 13.9 | 9.5 | 8.3 | 8.0 | 7.8 | 7.8 | 7.9 | 9.0 |
| Latin America & Caribbean | 9.3 | 6.9 | 5.8 | 6.8 | 6.6 | 6.8 | 7.1 | 9.1 |
| Oceania | 6.9 | 5.3 | 6.1 | 6.2 | 6.3 | 6.2 | 6.2 | 6.2 |
| North America & Europe | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |

Figure 2. Source: Food and Agriculture Organisation of the United Nations, 2020

1. Plot the information in ***Figure 2*** onto a graph in excel. Explain what the graph shows about the percentage of undernourished population over the past 15 years:
2. Suggest a possible reason for the increase after 2019:



Study the infographic on the previous page.

1. List 3 things that humans could do to combat threats to food security

Graphical user interface, text, application, Word

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1. Pick one of the dilemmas above. Write a short persuasive paragraph arguing for one side of the argument. Make sure to include a topic sentence, 2-3 sentences of persuasion, and a concluding sentence.

**Watch the video ‘The Futuristic Farms That Will Feed the World’ (on haiku).**

1. Describe some of the technological innovations discussed in the video that may solve the problem of producing enough food for the world’s increasing population.
2. List some potential problems that could arise from these methods of farming.

Part 5: Biomass

* 1. What is biomass?
  2. In the space below, draw a diagram of the three methods of converting biomass to biopower

Direct combustion:

Gasification:

Anerobic digestion:

In the table below, list some of the positives of biopower and some of the challenges or drawbacks that it creates.

|  |  |
| --- | --- |
| Biopower | |
| **Positives** | **Challenges and Drawbacks** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |