

Analytical Skills in ESS

1. Describing Graphs
Describe the following graphs

Graph	Description
<p>CHART 1</p> <p>Global Average Surface-Air Temperature Variations, 1979–2022</p> <p>DEPARTURE FROM 1991–2020 AVERAGE, IN DEGREES CELSIUS</p> <p>NOTE: Figures have been adjusted to align trends starting in 1979.</p> <p>SOURCES: Author's calculations based on data from five different observation-based datasets and 36 climate models taking part in the sixth IPCC Climate Model Intercomparison Project, and KNMI Climate Explorer, "Starting Point," https://climexp.knmi.nl/start.cgi (accessed January 10, 2024).</p> <p>BG3809 heritage.org</p>	
<p>Atmospheric CO₂ Is Highest in the Spring, Lowest in Autumn</p> <p>CO₂ is highest in Northern Hemisphere springtime.</p> <p>CO₂ measurements at Mauna Loa</p> <p>CO₂ decreases throughout the growing season as plants grow.</p> <p>Data from NOAA Global Monitoring Laboratory</p> <p>CLIMATE.NASA.GOV</p>	
<p>snow depth 12-2</p> <p>skier visits Compagnie des Alpes (three largest resorts)</p>	

2. Calculating percentages

How to calculate percentages?

Formula 1: Percentage or fraction or proportion

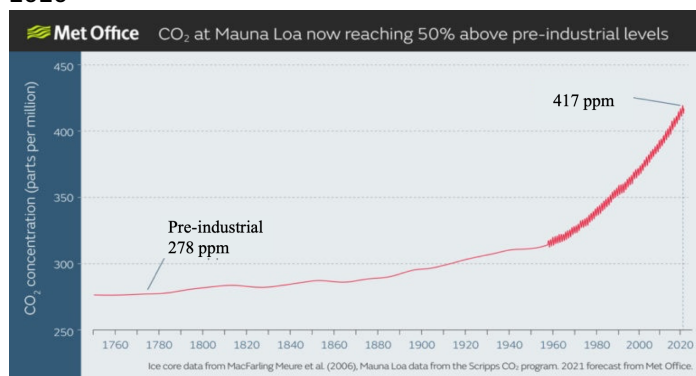
$$\text{Percentage} = \left(\frac{\text{Part}}{\text{Total}} \right) \times 100$$

Formula 2: Percentage of change (increase or decrease)

$$\text{Percent change} = \frac{\text{new value} - \text{old value}}{\text{old value}} \times 100$$

If the value you get is positive, it is increased. If the value is negative, the change is decreased.

- (a) Calculate the percentage increase from pre-industry to 2020



- (b) With reference to the data in Figure 4(a), calculate the percentage of the world's coral species found in the Coral Triangle.

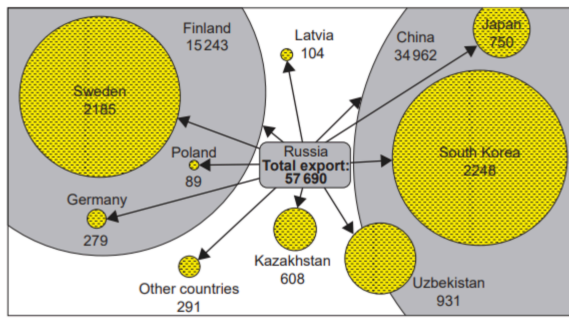
Figure 4(a): Species within the Coral Triangle

	Number within Coral Triangle	Global number
Coral species	605	798
Coral reef fishes	2228	6000
Marine turtles	6	7
Whale, dolphin and porpoise species	29	92

[Source: adapted from <http://wwf.panda.org> and www.marinespecies.org]

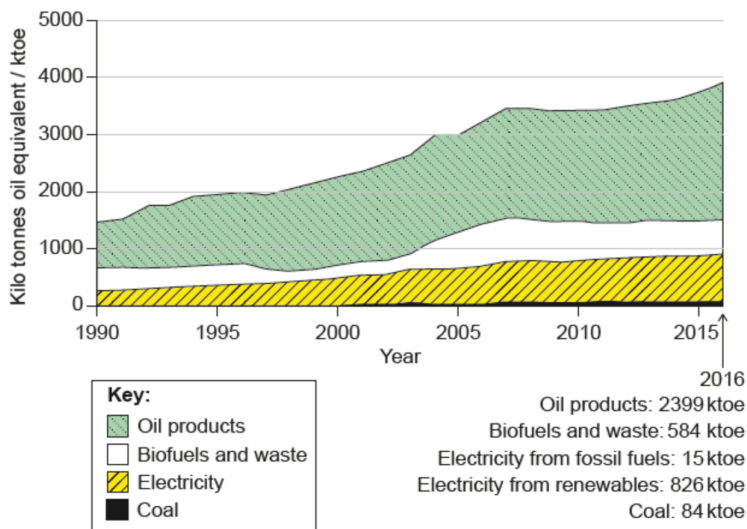
(C) With reference to **Figure 7(b)**, calculate the percentage of timber exports to China between the years 2012–2014

Figure 7(b): Total exports of timber (in units of thousand cubic metres) from Russia between 2012 and 2014



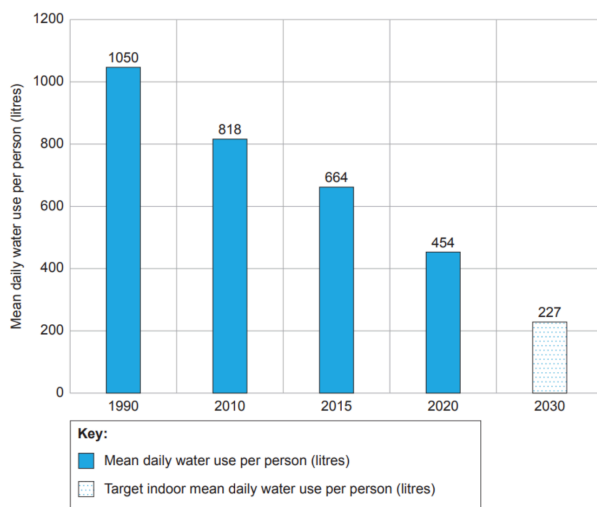
[Source: With permission from GRID-Arendal. Source adapted.]

(c) Calculate the percentage of energy consumed that came from fossil fuels in 2016.



(d) Calculate the percentage decrease from 1990 to 2020

Figure 6(c): Mean daily water use (in litres) per person in California



Theoretical Skills

1. Outline the distinctive characteristics of EVSs

Ecocentric	Anthropocentric	Technocentric

2. Outline 2 factors influencing someone's value

[illegible]

3. Question 3 is based on this figure:

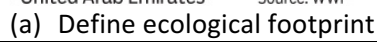


(a) State the type of system shown in the photograph above

(b) Identify 2 transfers and 2 transformations in the above system

[illegible]

- ### Top 10 countries with the biggest ecological footprint per person



[illegible]

5. Describe a positive feedback loop involving methane and a negative feedback loop involving albedo effect

Positive feedback loop	Negative feedback loop

6. Outline the effect of crossing the tipping point

7. Outline 2 ways to increase a system's resilience

8. Sketch a graph illustrating a resilient system that had just experienced a small disturbance

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9. Define sustainability and sustainable development

10. Outline three pillars of sustainability

11. Outline 3 factors leading to inequalities

12. Define the term biocapacity, carrying capacity and ecological overshooting. Use a graph to represent them

13. Explain how anthropocentric and ecocentric value systems influence how soil resources are managed.