

Model of the Earth Practice Questions - Set 1

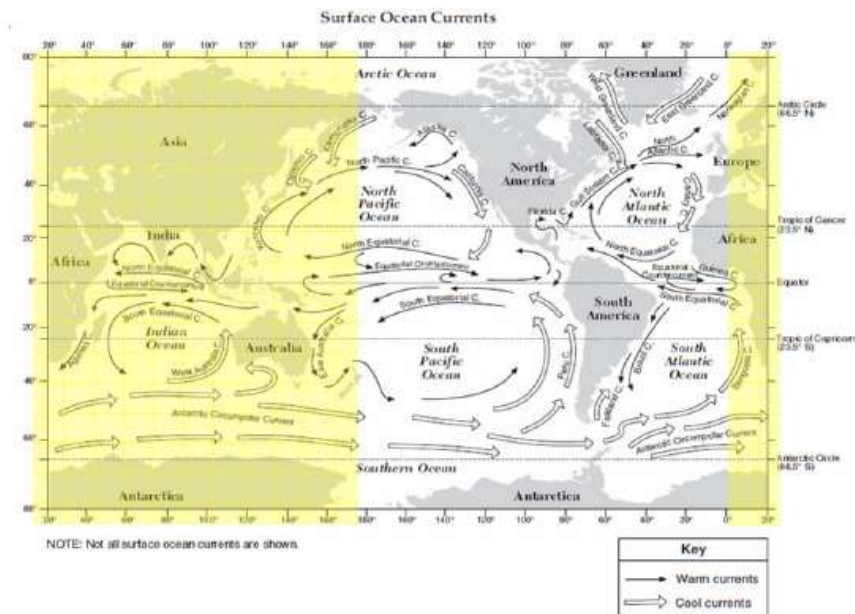
ANSWERS and EXPLANATIONS

1. **(1) 5°S, 30°W**

This is a typical latitude and longitude grid question. Notice all the numbers are the same – point L is south of the Equator, and west of the Prime Meridian.

2. **(2) 20°S, 135°E**

Use the world map on page 4 or 5 of the ESRT. Australia is south of the Equator and to the east of the Prime Meridian (Remember: the map wraps around – the shaded area is actually east of the Prime Meridian).



3. **(1)**



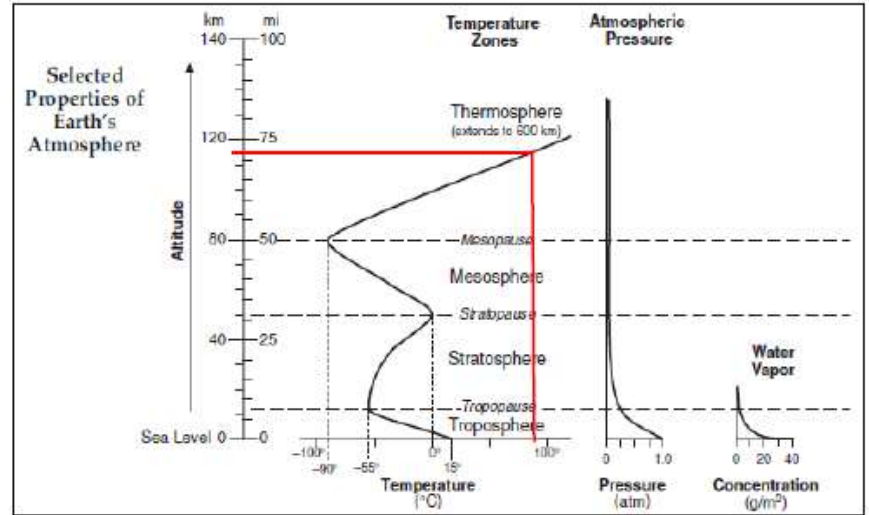
Latitude lines are parallel and longitude lines intersect at the poles.

4. **(3) atmosphere**

The atmosphere is 600 km in thickness. The hydrosphere has a 3.5km average depth and the lithosphere ranges from 75-150km. The thermosphere is just part of the atmosphere extending up from 80-600km (a thickness of 520km).

5. **(2) thermosphere**

Use the Layers of the Atmosphere chart on page 14 of the ESRT. The only place 95°C intersects the temperature line graph is in the thermosphere at an altitude of about 115km.



6. **(4) oxygen**

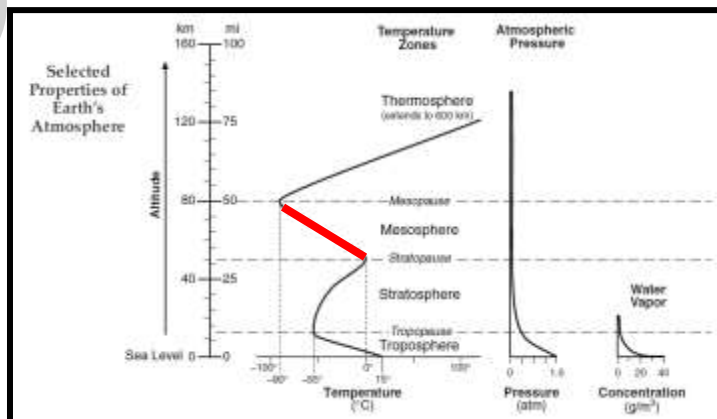
Use the Composition chart on page 1 of the ESRT. Oxygen is found in the crust (lithosphere), hydrosphere, and atmosphere (troposphere).

Average Chemical Composition of Earth's Crust, Hydrosphere, and Troposphere

ELEMENT (symbol)	CRUST		HYDROSPHERE	TROPOSPHERE
	Percent by mass	Percent by volume	Percent by volume	Percent by volume
Oxygen (O)	46.10	94.04	33.0	21.0
Silicon (Si)	28.20	0.88		
Aluminum (Al)	8.23	0.48		
Iron (Fe)	5.63	0.49		
Calcium (Ca)	4.15	1.18		
Sodium (Na)	2.36	1.11		
Magnesium (Mg)	2.33	0.33		
Potassium (K)	2.09	1.42		
Nitrogen (N)				78.0
Hydrogen (H)			66.0	
Other	0.91	0.07	1.0	1.0

7. **(1) decreases, only**

The ESRT shows that in the mesosphere there is an inverse relationship between altitude and temperature.

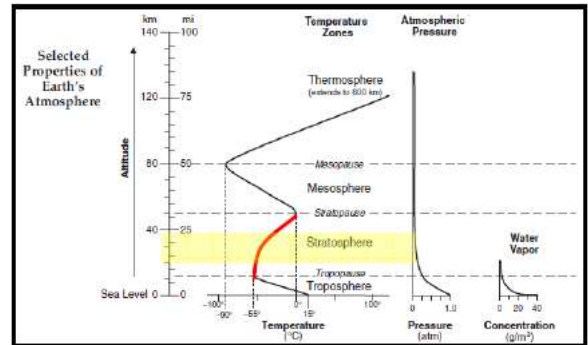


8. **(3) 15°N, 20°W**

This is a typical latitude and longitude grid question. Notice all the numbers are the same – point A is north of the Equator, and west of the Prime Meridian.

9. **(4) stratosphere**

It's just a fact – the ozone layer is located in the upper stratosphere. But, if you use the Layers of the Atmosphere Chart, you can see that an altitude of 20-35 km (highlighted to the right) is located in the stratosphere.



10. **(1) Each is an interface (boundary) between two layers of the atmosphere.**

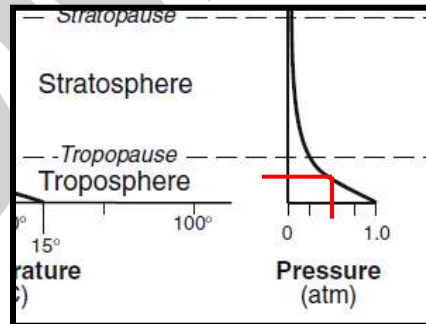
It's just a fact – the “pauses” are the boundaries (interfaces) between the different layers of the atmosphere. The other three statements are false.

11. **(4) stratosphere, mesosphere, and thermosphere**

The diagram given in the question is just there to confuse you ... Use the Layers of the Atmosphere chart in the ESRT to remind you which list includes terms that refer to the layers of the atmosphere.

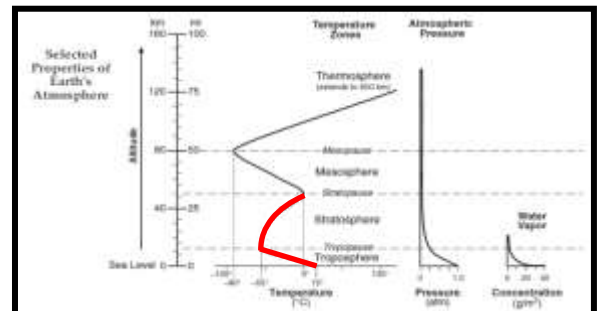
12. **(1) troposphere**

Go to 0.5 atm on the x-axis, up to the graph line, and then across... The value represents an air pressure that would exist in the troposphere.



13. **(3) decreases, then increases**

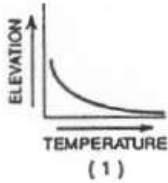
Look at the red line in the diagram of the ESRT to the right. Sea level to 50 km takes you through the troposphere and the stratosphere. Along the way the temperature decreases from 15°C to -55°C, and then increases to 0°C.



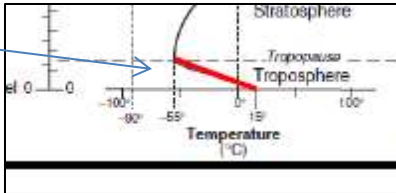
14. (2) **troposphere, stratosphere, mesosphere, thermosphere**

Once again – use the ESRT – just look at the order of the layers from the ground up.

15. (1)

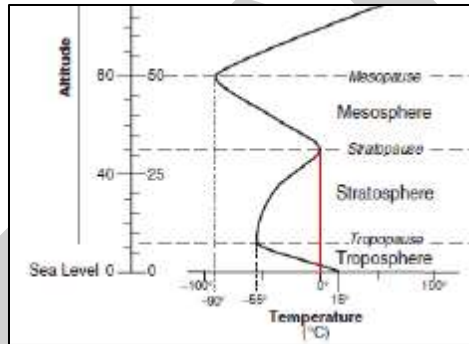


Just match up the graph from the choices with what is occurring in the troposphere as is shown in the ESRT



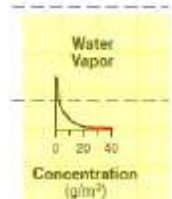
16. (3) **0°C**

Use the Layers of the Atmosphere chart on page 14 of the ESRT. There is a dashed line that extends from the temperature graph line to show that at the stratopause the temperature is 0°C.



17. (4) **30-40 g/m³**

Use the Layers of the Atmosphere chart on page 14 of the ESRT. The graph highlighted shows that as altitude increases, the amount of water vapor decreases. The red line shows that at sea level (0km) the concentration of water vapor ranges between 20-40 g/m³. Only choice (4) 30-40 g/m³ falls within this range.



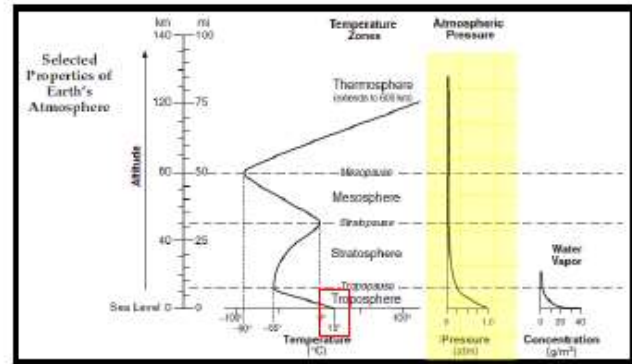
18. (1) **nitrogen**

Use the Composition chart on page 1 of the ESRT. Nitrogen makes up 78% of the troposphere.

Average Chemical Composition of Earth's Crust, Hydrosphere, and Troposphere

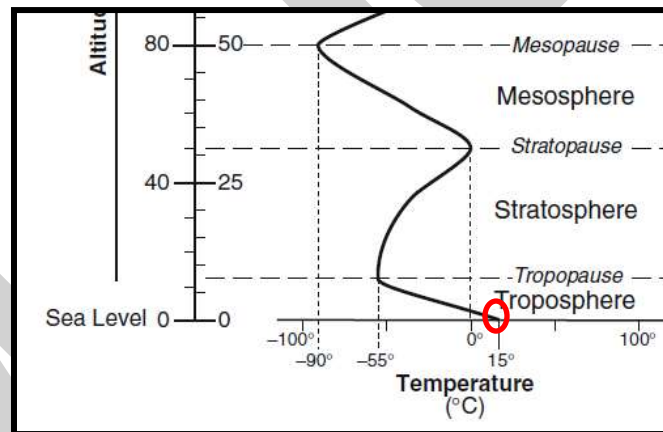
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19. **(1) decreases, only**
 Use the Layers of the Atmosphere chart on page 14 of the ESRT.
 The highlighted graph indicates an inverse relationship between altitude and atmospheric pressure.
 It doesn't matter what layer of the atmosphere you are talking about – as altitude increases, air pressure decreases.



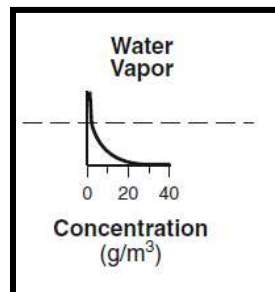
20. **(2) 39 km**
 Use the Layers of the Atmosphere chart on page 14 of the ESRT.
 The stratosphere starts at an altitude of 11km and ends at about 50km. By subtracting those numbers, the mesosphere is approximately 39km thick.

21. **(1) 15°C**
 Use the Layers of the Atmosphere chart on page 14 of the ESRT.
 Just look at the bottom-most part of the temperature graph.
 The graph line starts right at 15°C on the line marked "sea level".



22. **(3) 80 km**
 ESRT once again ... look at the diagram above and see how the mesopause line extends to 80 km or 50 miles.

23. **(1) decreases, only**
 The water vapor graph in the ESRT shows that as altitude increases, water vapor decreases (an inverse relationship).



24. **(3) troposphere**
 To have weather (clouds, precipitation ...), there needs to be moisture. Since most of the moisture is in the troposphere, most of the weather is too. Remember that in the lab you drew lightning bolts in the troposphere to symbolize the weather that occurs there.