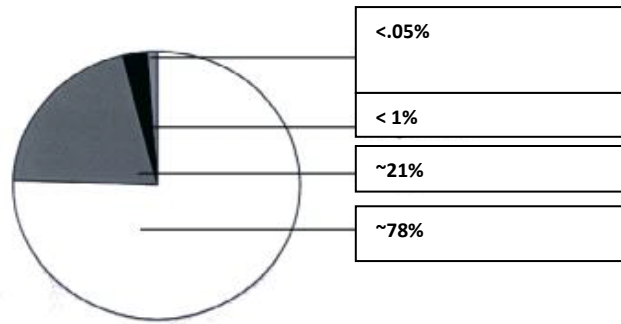


## Marine Biology Chapter Review Questions

## Chapter 8: Air-Sea Interaction

### Part 1: The Solar Connection (pages 3-7)

1. Fill in the chart to show the gasses in the atmosphere based percentages



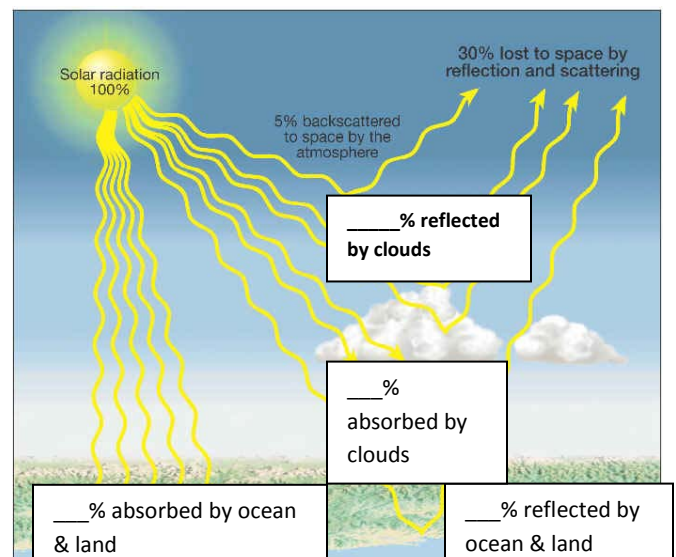
2. List the 4 layers of atmosphere and distance they extend above sea level.

Layer	Distance

3. Which layer concerns us most? \_\_\_\_\_ why? \_\_\_\_\_
4. Which layers affect air quality, weather and air-sea interactions most? \_\_\_\_\_
5. As temperature rises, air pressure \_\_\_\_\_ and density \_\_\_\_\_.
6. How does water vapor affect density? \_\_\_\_\_
7. Why is the movement of air masses important in marine science?

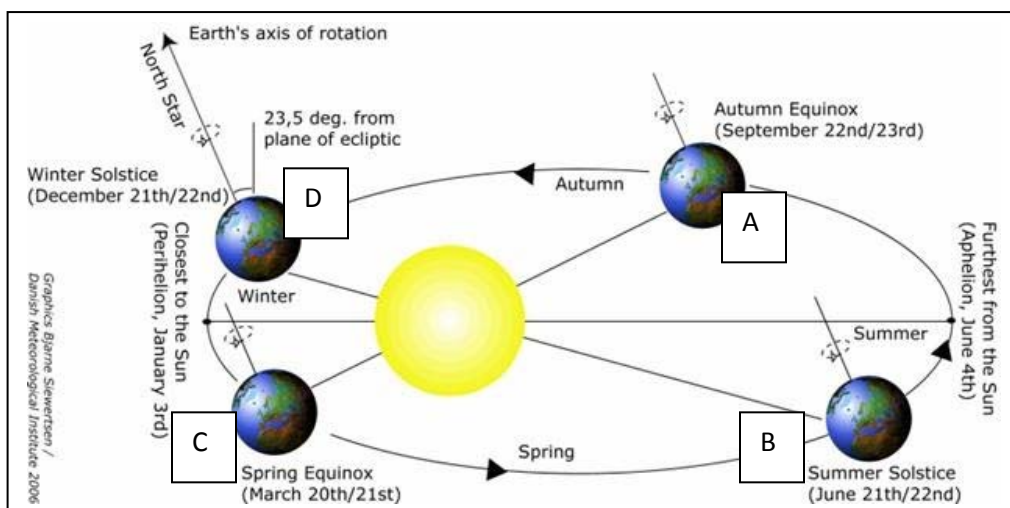
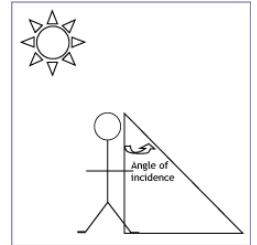
### Part 2: The Earth's Heat Balance (pages 8-9)

1. The atmosphere absorbs or reflects about \_\_\_\_\_% of the sunlight that reaches earth.
2. Why is this a good thing?
3. Solar energy consists of \_\_\_\_\_, ultraviolet, and \_\_\_\_\_ light
4. The measure of the amount of energy something reflects is called the \_\_\_\_\_.
5. Explain the greenhouse effect.
6. How much cooler would the earth be without the greenhouse effect? \_\_\_\_\_



**Part 3: Uneven Heating (pages 10-14)**

1. How would temperatures be different if the sun did not heat the earth unevenly?
2. The 3 factors that cause the earth to heat unevenly are
  - a.
  - b.
  - c.
3. In fig. 8.6, what is the difference in the angle of incidence in figure A and figure B?
4. How is the angle of incidence different near the poles vs. at the equator (see fig. 8.7)?
5. The orbital inclination describes how the Earth doesn't spin with its axis \_\_\_\_\_ to the plane of its \_\_\_\_\_ around the sun, but at about \_\_\_\_\_ off.
6. Why does the amount of sunlight hitting different parts of the Earth cause seasons?
7. How does the elliptical orbit of the earth around the sun affect the temperature on earth?
8. Using the diagram of the earth's orbit, answer the following questions
  - a. Where are the days the longest in the northern hemisphere? \_\_\_\_\_
  - b. Where is the angle of incidence the greatest in the northern hemisphere? \_\_\_\_\_
  - c. Circle the orbital inclination
  - d. If the earth is closer to the sun during winter (northern hemisphere), why is it colder?
  - e. Where are the days the longest in the southern hemisphere? \_\_\_\_\_

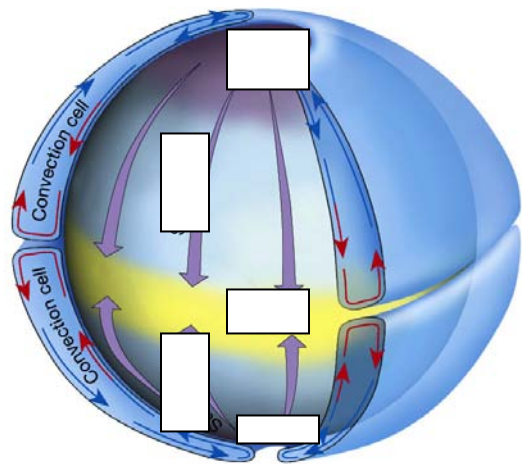
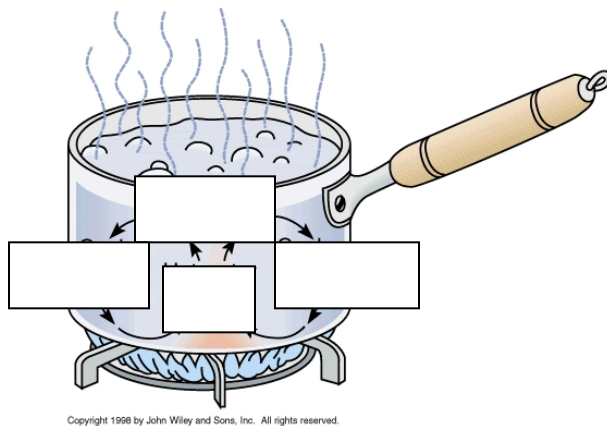


9. How do seasonal changes affect gray whale migration?

10. Convection is the \_\_\_\_\_ movement of currents caused by \_\_\_\_\_ differences in a \_\_\_\_\_ such as air.

11. What causes convection currents on earth?

12. On the diagrams below, label the direction of warmer vs. cooler temperatures. On the earth diagram also label surface flow.



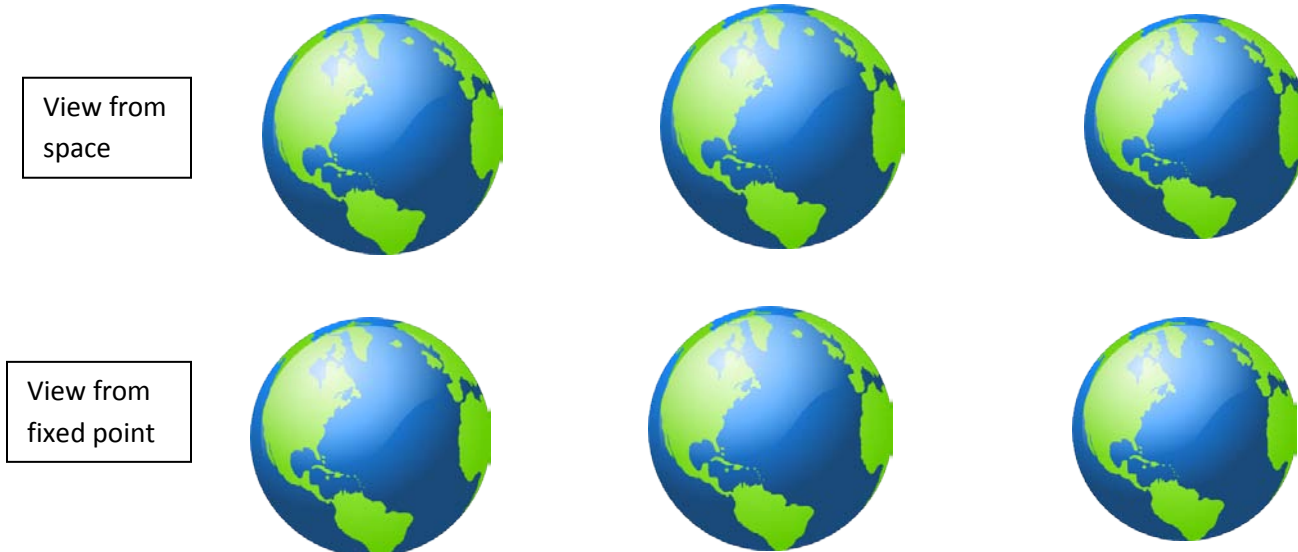
13. What is idealized convection flow?

Answer the 'Are you learning' questions on page 8-14.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_

#### Part 4: The Coriolis Effect & The Earth's Rotation (pages 15-19)

1. The Coriolis Effect is the tendency for the path of a \_\_\_\_\_ to \_\_\_\_\_ to the right in the \_\_\_\_\_ hemisphere and to the left in the \_\_\_\_\_ hemisphere.
2. The Coriolis Effect is a major factor in the distribution of what?
3. How does the speed at which the earth spins different based on latitude?
  - a. Speed at 90 N: \_\_\_\_\_
  - b. Speed at 45 N: \_\_\_\_\_
  - c. Speed at 0 (equator): \_\_\_\_\_
4. In the space below illustrate the apparent deflection of an object from space and from a fixed point (fig. 8-15)



5. What causes the 'apparent' deflection of objects moving from the equator to the poles?
6. How does the Coriolis Effect affect wind and ocean currents?

Answer the 'Are you learning' questions on page 8-19.

1. \_\_\_\_\_
2. \_\_\_\_\_

#### Part 5: The Winds & Intertropical Convergence Zones (pages 20-23)

1. What are atmospheric circulation cells?
2. The 3 major atmospheric circulation cells are
  - a. \_\_\_\_\_ between \_\_\_\_\_ & \_\_\_\_\_ latitudes
  - b. \_\_\_\_\_ between \_\_\_\_\_ & \_\_\_\_\_ latitudes
  - c. \_\_\_\_\_ between \_\_\_\_\_ & \_\_\_\_\_ latitudes

3. Fill in the chart describing the following winds.

Belt	Latitude	Circulation cell	characteristics
Trade winds			
Westerlies			
Horse Latitudes			
Polar Easterlies			
ITCZ			

4. Why do most deserts occur around 30 degrees North or South of the equator?

5. What happens where the Trade Winds meet?

6. What does ITCZ stand for?

7. Why are some of the wettest climates found along the ITCZ?

8. What causes the shifting in the ITCZ?

**Part 6: Monsoons and Cyclones (pages 23-25)**

1. Monsoons are seasonal \_\_\_\_\_ patterns caused by heating or \_\_\_\_\_ on the continents.

2. Describe summer monsoons weather.

3. Describe winter monsoons weather.

4. Cyclones are large \_\_\_\_\_ systems of low-pressure air with \_\_\_\_\_ winds at the center.

5. What is the difference between a typhoon and a hurricane?

6. Why don't we experience cyclones in California?

Answer the 'Are you learning' questions on page 8-27.

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_ 5. \_\_\_\_\_ 6. \_\_\_\_\_  
7. \_\_\_\_\_ 8. \_\_\_\_\_ 9. \_\_\_\_\_ 10. \_\_\_\_\_ 11. \_\_\_\_\_