

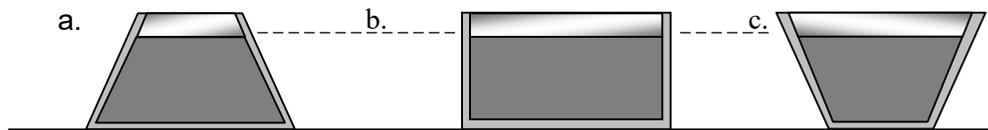
Chapter 8A

Physical Science

Read page 174 - 181.

Show your work on all math problems.

- Both liquids and gases are fluids because they have two properties. What two properties do fluids have?
- Write the formula for calculating pressure.
- Use pressure to explain why it is better to have a 200-lb basketball player step on your toes with his large shoes than a 90-lb fashion model step on your toes with a $\frac{1}{4}$ -inch square high heel shoes.
- What is the SI unit for pressure? Who was this unit named for?
- List two other units for pressure.
- Why is there more pressure at the bottom of a pool than near the surface of the pool?
- What is the water pressure at the surface of a container of water?
- Which container has the greatest pressure at the bottom?



- What is hydrostatic pressure?
- What is the most important factor controlling hydrostatic pressure in liquids?
- What factor affects atmospheric pressure more than hydrostatic pressure?
- How does atmospheric pressure change as altitude increases?
- What is one advantage of using an aneroid barometer instead of a mercury barometer?
- What is Archimedes' principle?
- A wooden block is placed in a full tank of water, and some of the water spills out. The weight of the water that spills out is 12 pounds. What is the buoyant force on the block of wood?
- Determine whether each substance will sink or float in water:
 - Ebony (wood) – 1.3 g/cm^3
 - Gasoline – 0.9 g/cm^3
 - Salt – 2.2 g/cm^3
 - Ice – 0.92 g/cm^3
 - Balsa wood – 0.12 g/cm^3
 - Corn syrup – 1.3 g/cm^3
- Steel has a density of 7.8 g/cm^3 and solid steel will sink in water. Ships are made out of steel. Explain why they float.

Chapter 8B

Physical Science

Read page 182 - 187.

Show your work on all math problems.

1. What is Pascal's principle?
2. What conditions must exist for Pascal's principle to be true?
3. Explain how a hydraulic lift works.
4. What three factors affect the flow of a fluid?
5. In a continuous pipe, the pressure at Point A is 5 psi and the pressure at Point B is 2 psi. Which way does the fluid flow: From A to B or from B to A?



6. Write the equation for the Bernoulli principle.
7. Why are water tanks located on top of hills instead of at the bottom of hills?
8. What is a venturi?
9. What is the Coanda effect?
10. How is the lift for an airplane wing generated?

Chapter 8C

Physical Science

Read page 188 - 193.

Show your work on all math problems.

Matching:

- | | |
|---------------------------------|--|
| _____ 1. Evangelista Torricelli | a. Built a gas thermometer. |
| _____ 2. Robert Boyle | b. Determined that, in a mixture of gases, each gas exerts its own pressure, and the total pressure of the gas mixture is equal to the sum of these pressures. |
| _____ 3. Guillaume Amontons | c. Discovered that equal volumes of gas contain an equal number of molecules. |
| _____ 4. Jacques Charles | d. Proved that gases have weight. |
| _____ 5. John Dalton | e. Discovered that gases react in whole-number ratios. |
| _____ 6. Joseph Gay-Lussac | f. Determined that the volume of a gas and its temperature are directly related. |
| _____ 7. Amedeo Avogadro | g. Determined that the volume of a gas and its pressure are inversely related. |

8. What three properties does gas pressure depend on?

9. If the speed of gas molecules increases, what happens to the temperature of the gas?

10. If you double the pressure on a gas, how will the volume change: will it double or be cut in half?

11. Use Boyle's Law to find the missing values. **Boyle's Law: $P_1V_1 = P_2V_2$**

	Pressure 1	Volume 1	Pressure 2	Volume 2
a.	28 psi	5 cubic feet	10 psi	
b.	500 kPascals	8 cubic meters		20 cubic meters
c.	800 torr	200 cm ³	1200 torr	

12. A weather balloon is inflated with 0.8 m³ of helium at a pressure of 1.0 atm. The balloon is released and rises into the air. What is the pressure of the gas when the balloon expands to a volume of 3.32 m³?

13. What temperature scale must be used with Charles' Law?

14. Convert degrees Celsius to Kelvin:

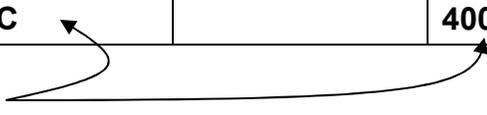
a. 125°C = _____ K

b. -50° = _____ K

15. Use Charles' Law to find the missing values. Charles' Law: $\frac{V_1}{T_1} = \frac{V_2}{T_2}$

	Volume 1	Temperature 1	Volume 2	Temperature 2
a.	140 cubic meters	200 Kelvin		100 Kelvin
b.	80 cm ³	60 Kelvin	160 cm ³	
c.	150 m ³	200°C		400°C

Remember to convert to Kelvin.



16. A 2-Liter collapsible plastic container is heated to 120°C and sealed. If it is cooled to a temperature of -10°C, what will the new volume of the container be? (Pay attention to the temperature, **oK**? Hint, hint.)