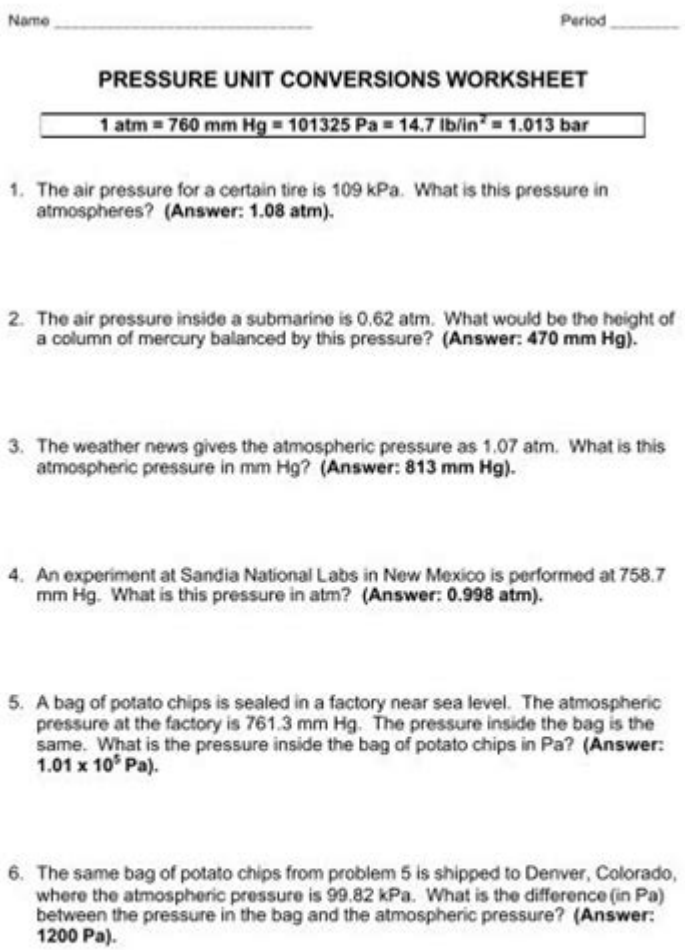
Pressure Conversion Worksheet Answer Key



Name _____ Period _____

PRESSURE UNIT CONVERSIONS WORKSHEET

1 atm = 760 mm Hg = 101325 Pa = 14.7 lb/in^2 = 1.013 bar

1. The air pressure for a certain tire is 109 kPa. What is this pressure in atmospheres? **(Answer: 1.08 atm).**

2. The air pressure inside a submarine is 0.62 atm. What would be the height of a column of mercury balanced by this pressure? **(Answer: 470 mm Hg).**

3. The weather news gives the atmospheric pressure as 1.07 atm. What is this atmospheric pressure in mm Hg? **(Answer: 813 mm Hg).**

4. An experiment at Sandia National Labs in New Mexico is performed at 758.7 mm Hg. What is this pressure in atm? **(Answer: 0.998 atm).**

5. A bag of potato chips is sealed in a factory near sea level. The atmospheric pressure at the factory is 761.3 mm Hg. The pressure inside the bag is the same. What is the pressure inside the bag of potato chips in Pa? **(Answer: 1.01 x 10^5 Pa).**

6. The same bag of potato chips from problem 5 is shipped to Denver, Colorado, where the atmospheric pressure is 99.82 kPa. What is the difference (in Pa) between the pressure in the bag and the atmospheric pressure? **(Answer: 1200 Pa).**

Pressure Conversion Worksheet Answer Key

Pressure is a fundamental concept in physics and engineering, representing the force applied per unit area. In various fields, accurate pressure measurements are crucial, whether in meteorology, aviation, or fluid dynamics. Understanding how to convert between different pressure units is essential for students and professionals alike. This article delves into pressure conversion worksheets, providing a comprehensive answer key to help learners grasp the concept effectively.

Understanding Pressure Units

Pressure is measured in different units, each with its application. The most common pressure units include:

- Pascal (Pa): The SI unit for pressure, defined as one newton per square meter.
- Atmosphere (atm): A unit based on the average atmospheric pressure at sea level.
- Millimeter of mercury (mmHg): A traditional unit of pressure derived from the height of a mercury column.
- Torr: A unit equivalent to 1 mmHg, often used in vacuum measurements.
- Pound per square inch (psi): A unit commonly used in the United States, particularly in automotive and industrial contexts.
- Bar: A unit equal to 100,000 pascals, used in various scientific fields.

Understanding these units is crucial for converting pressure measurements accurately.

Conversion Factors

To convert between different pressure units, it's essential to know the conversion factors. Here are some commonly used conversion factors:

- 1 atm = 101,325 Pa
- 1 atm = 760 mmHg
- 1 atm = 760 Torr
- 1 atm = 14.696 psi
- 1 atm = 1.01325 bar
- 1 Pa = 0.00001 atm
- 1 mmHg = 0.00131579 atm
- 1 psi = 0.0689476 atm

These conversion factors serve as the foundation for solving pressure conversion problems.

Creating a Pressure Conversion Worksheet

A pressure conversion worksheet typically includes problems requiring students to convert from one pressure unit to another. Here’s how to create a simple worksheet:

1. Identify the Units: Choose a variety of pressure units, such as atm, Pa, mmHg, psi, and bar.
2. Formulate Problems: Create problems that require conversions between these

units. For example:
- Convert 2.5 atm to mmHg.
- Convert 150 psi to Pa.
- Convert 101,325 Pa to bar.
3. Provide Space for Answers: Ensure each problem has space for students to show their work and write their answers.

Sample Pressure Conversion Problems

Here are some sample problems that might appear on a pressure conversion worksheet:

1. Convert 3.0 atm to mmHg.
2. Convert 500 mmHg to psi.
3. Convert 50 psi to kPa.
4. Convert 200,000 Pa to bar.
5. Convert 14.7 psi to atm.

Answer Key for Pressure Conversion Worksheet

Below is a comprehensive answer key for the sample problems provided above:

Problem 1: Convert 3.0 atm to mmHg

To convert from atm to mmHg, use the conversion factor:
$$
3.0 \, \text{atm} \times 760 \, \text{mmHg/atm} = 2,280 \, \text{mmHg}
$$

Answer: 2,280 mmHg

Problem 2: Convert 500 mmHg to psi

To convert from mmHg to psi, use the conversion factor:
$$
500 \, \text{mmHg} \times \frac{1 \, \text{atm}}{760 \, \text{mmHg}} \times 14.696 \, \text{psi/atm} = 97.66 \, \text{psi}
$$

Answer: 97.66 psi

Problem 3: Convert 50 psi to kPa

To convert from psi to kPa, use the conversion factor:
$$
50 \, \text{psi} \times 6.89476 \, \text{kPa/psi} = 344.74 \, \text{kPa}
$$

Answer: 344.74 kPa

Problem 4: Convert 200,000 Pa to bar

To convert from Pa to bar, use the conversion factor:
$$
200,000 \, \text{Pa} \times \frac{1 \, \text{bar}}{100,000 \, \text{Pa}} = 2.0 \, \text{bar}
$$

Answer: 2.0 bar

Problem 5: Convert 14.7 psi to atm

To convert from psi to atm, use the conversion factor:
$$
14.7 \, \text{psi} \times \frac{1 \, \text{atm}}{14.696 \, \text{psi}} = 0.999 \, \text{atm}
$$

Answer: 0.999 atm

Practical Applications of Pressure Conversion

Understanding pressure conversions is not only important for academic purposes but also has practical applications in various fields:

1. Meteorology: Accurate pressure measurements are crucial for weather forecasting. Meteorologists often convert pressure readings from different instruments to a standard unit.
2. Aerospace Engineering: In designing aircraft, engineers must convert pressure readings during testing to ensure safety and performance.
3. Fluid Dynamics: In hydraulic systems, pressure conversions help in the analysis and design of fluid flow systems.
4. Medical Applications: Blood pressure readings are often converted between mmHg and kPa for standardization.

Conclusion

The ability to convert pressure units accurately is an essential skill in science and engineering. A pressure conversion worksheet, accompanied by a detailed answer key, serves as an effective educational tool, enabling students to practice and master the concept of pressure units. By understanding the various units of pressure and their conversions, learners can apply this knowledge across multiple disciplines, enhancing their comprehension of physical principles and real-world applications. Whether for academic studies or professional use, mastering pressure conversions opens up pathways to a deeper understanding of the world of science and technology.

Frequently Asked Questions

What is a pressure conversion worksheet?

A pressure conversion worksheet is a tool used to help students or professionals practice converting pressure units from one measurement system to another, such as from pascals to atmospheres or mmHg.

Where can I find an answer key for a pressure conversion worksheet?

An answer key for a pressure conversion worksheet can typically be found in educational resources, textbooks, online educational websites, or provided by teachers as part of a classroom assignment.

What are common units of pressure that might be included in a pressure conversion worksheet?

Common units of pressure include pascals (Pa), atmospheres (atm), millimeters of mercury (mmHg), pounds per square inch (psi), and bar.

How do you convert from psi to pascals?

To convert from psi to pascals, you multiply the psi value by 6894.76, as 1 psi is equal to 6894.76 pascals.

What is the significance of mastering pressure conversions?

Mastering pressure conversions is important in fields such as physics, engineering, and meteorology, as it allows professionals to communicate and interpret pressure data accurately across different measurement systems.

Can pressure conversion worksheets be beneficial for exam preparation?

Yes, pressure conversion worksheets are beneficial for exam preparation as they reinforce understanding of pressure concepts and improve problem-solving skills related to real-world applications.

What types of problems might you encounter on a pressure conversion worksheet?

You might encounter problems that require you to convert between different pressure units, calculate pressure using given measurements, or apply pressure conversion in practical scenarios such as gas laws or fluid dynamics.

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Unlock your understanding of pressure conversions with our comprehensive worksheet answer key. Enhance your skills and accuracy. Learn more today!

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