

Specific Heat Worksheet Answers

Name _____

Chemistry Period _____

Worksheet Specific Heat

Specific Heat of water = $4.18 \text{ J/g}^\circ\text{C}$

1. A sample of mercury is heated from 25.5°C to 52.5°C . In the process, 3050 J of heat are absorbed. What mass of mercury was in the sample? The specific heat of mercury is $0.140 \text{ J/g}^\circ\text{C}$. **ANS: 807 g**
2. A block of aluminum with a mass of 140 g is cooled from 98.4°C to 62.2°C with a release of 1137 J of heat. From these data, calculate the specific heat of aluminum. **ANS: 0.224**
3. A total of 226 J of heat are absorbed as 58.3 g of lead is heated from 12.0°C to 42.0°C . From this data, what is the specific heat of lead? **ANS: 0.129**
4. What is the change in heat energy when 132 g of copper at 32.2°C is raised to 45.0°C ? The specific heat of copper is $0.385 \text{ J/g}^\circ\text{C}$. **ANS: 650 J**
5. What is the change in heat energy when 40.0 g of water at 25.0°C is raised to 60.0°C ? **ANS: 5852 J**
6. What is the change in heat energy when 75.0 of water at 9.8°C is raised to 22.4°C ? **ANS: 3950 J**
7. What is the change in heat energy when 125 g of water at 10.0°C is raised to 90.0°C ? **ANS: 41.8 kJ**
8. What is the change in heat energy when 64.82 g of aluminum metal at 100.0°C is cooled to 82.0°C ? The specific heat of aluminum is $0.897 \text{ J/g}^\circ\text{C}$. **ANS: 1047**
9. What is the change in temperature if 24 g of water at 50°C absorbs 985 J of heat energy? **ANS: 9.82**
10. What is the mass of a sample of iron if that sample lost 2300 J of heat energy when it cooled from 80°C to 30°C ? The specific heat of iron is $0.449 \text{ J/g}^\circ\text{C}$. **ANS: 102 g**
11. What is the specific heat of metal if its mass is 26.86 g and it requires 418.6 J of heat energy to raise its temperature from 27.4°C to 67.3°C ? **ANS: 0.391**
12. How much heat energy is needed to raise the temperature of 59.7 g of cadmium from 25°C to 100°C ? The specific heat of cadmium is $0.231 \text{ J/g}^\circ\text{C}$. **ANS: 1034 J**

Specific Heat Worksheet Answers: A Comprehensive Guide to Mastering Thermodynamics

Are you struggling with specific heat calculations? Feeling overwhelmed by those tricky thermodynamics worksheets? You're not alone! Many students find the concept of specific heat challenging, but mastering it is crucial for understanding various aspects of physics and chemistry. This comprehensive guide provides not only the answers to common specific heat worksheets but also a thorough explanation of the underlying principles, ensuring you understand the why behind the how. We'll break down the calculations step-by-step, offering valuable insights to boost your understanding and improve your problem-solving skills. Get ready to conquer those worksheets and

ace your next thermodynamics exam!

Understanding Specific Heat: The Foundation

Before diving into the answers, let's solidify our understanding of specific heat. Specific heat capacity (often represented as 'c') is the amount of heat required to raise the temperature of one gram of a substance by one degree Celsius (or one Kelvin). Different substances have different specific heat capacities. Water, for example, has a relatively high specific heat capacity, meaning it takes a significant amount of heat to change its temperature. This is why oceans regulate temperature so effectively.

The Formula: Your Key to Success

The fundamental formula used in most specific heat calculations is:

$$Q = mc\Delta T$$

Where:

Q represents the heat energy transferred (usually measured in Joules or calories).

m represents the mass of the substance (usually measured in grams or kilograms).

c represents the specific heat capacity of the substance (usually measured in J/g°C or cal/g°C).

ΔT represents the change in temperature (final temperature - initial temperature), measured in °C or K.

Specific Heat Worksheet Answers: Example Problems and Solutions

Now, let's tackle some common specific heat worksheet problems. Remember, understanding the process is just as important as getting the correct numerical answer.

Problem 1: Heating Water

Problem: How much heat is required to raise the temperature of 50 grams of water from 20°C to 100°C? The specific heat capacity of water is 4.18 J/g°C.

Solution:

1. Identify the knowns: $m = 50 \text{ g}$, $c = 4.18 \text{ J/g°C}$, $\Delta T = 100^\circ\text{C} - 20^\circ\text{C} = 80^\circ\text{C}$
2. Apply the formula: $Q = mc\Delta T = (50 \text{ g})(4.18 \text{ J/g°C})(80^\circ\text{C}) = 16720 \text{ J}$

Therefore, 16,720 Joules of heat are required.

Problem 2: Determining Specific Heat

Problem: A 200-gram sample of an unknown metal absorbs 1500 J of heat, causing its temperature to increase from 25°C to 50°C. What is the specific heat capacity of the metal?

Solution:

1. Identify the knowns: $Q = 1500 \text{ J}$, $m = 200 \text{ g}$, $\Delta T = 50^\circ\text{C} - 25^\circ\text{C} = 25^\circ\text{C}$
2. Rearrange the formula to solve for 'c': $c = Q / (m\Delta T) = 1500 \text{ J} / (200 \text{ g } 25^\circ\text{C}) = 0.3 \text{ J/g}^\circ\text{C}$

The specific heat capacity of the metal is 0.3 J/g°C.

Problem 3: Calculating Final Temperature

Problem: A 100-gram block of aluminum ($c = 0.90 \text{ J/g}^\circ\text{C}$) initially at 20°C absorbs 500 J of heat. What is its final temperature?

Solution:

1. Identify the knowns: $Q = 500 \text{ J}$, $m = 100 \text{ g}$, $c = 0.90 \text{ J/g}^\circ\text{C}$
2. Rearrange the formula to solve for ΔT : $\Delta T = Q / (mc) = 500 \text{ J} / (100 \text{ g } 0.90 \text{ J/g}^\circ\text{C}) = 5.56^\circ\text{C}$
3. Calculate the final temperature: Final Temperature = Initial Temperature + $\Delta T = 20^\circ\text{C} + 5.56^\circ\text{C} = 25.56^\circ\text{C}$

The final temperature of the aluminum block is approximately 25.56°C.

Tips for Success with Specific Heat Problems

Always write down the known variables. This helps organize your thoughts and reduces the risk of errors.

Pay close attention to units. Ensure consistency in units throughout your calculations.

Double-check your calculations. Simple arithmetic mistakes can lead to incorrect answers.

Practice, practice, practice! The more problems you solve, the more comfortable you'll become with the concepts and calculations.

Conclusion

Mastering specific heat calculations is a crucial step in understanding thermodynamics. By understanding the fundamental formula ($Q = mc\Delta T$) and practicing with various problem types, you can confidently tackle any specific heat worksheet. Remember to always break down the problem, identify the knowns, and carefully apply the formula. With consistent effort and practice, you'll develop the skills necessary to excel in thermodynamics.

FAQs

1. What happens if the specific heat capacity isn't given in the problem? You'll usually need to look up the specific heat capacity of the substance in a reference table.
2. Can I use Kelvin instead of Celsius for temperature? Yes, as long as you maintain consistency throughout the calculation. The change in temperature (ΔT) will be the same in both scales.
3. What are some real-world applications of specific heat? Specific heat is crucial in understanding climate change, designing efficient heating and cooling systems, and many industrial processes.
4. How do I handle problems with phase changes (melting or boiling)? These problems require additional considerations and involve latent heat, which is beyond the scope of basic specific heat calculations.
5. Where can I find more practice problems? Many physics and chemistry textbooks offer ample practice problems, and online resources, such as educational websites and YouTube channels, provide additional examples and explanations.

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culture values will yield the superior character that will benefit children in the face of a globalized world. So is innovation technology-based learning, make learning be fun so that children become active and creative ideas, thoughts, research related to the innovation of education can be presented in International Conference Education, Culture and technology is preferred. The theme of this Conference: Innovation of Education to Improve Character Value for Children.

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plan and teach science lessons so students acquire scientific ideas in meaningful ways. Emphasising the important relationship between curriculum, pedagogy and the subject itself, this exciting book will help you teach in a way that captivates and motivates students, allowing them to share in the delight and wonder of the explanatory power of science.

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Kaviany, 2012-12-06 Although the empirical treatment of fluid flow and heat transfer in porous media is over a century old, only in the last three decades has the transport in these heterogeneous systems been addressed in detail. So far, single-phase flows in porous media have been treated or at least formulated satisfactorily, while the subject of two-phase flow and the related heat-transfer in porous media is still in its infancy. This book identifies the principles of transport in porous media and compares the available predictions based on theoretical treatments of various transport mechanisms with the existing experimental results. The theoretical treatment is based on the volume-averaging of the momentum and energy equations with the closure conditions necessary for obtaining solutions. While emphasizing a basic understanding of heat transfer in porous media, this book does not ignore the need for predictive tools; whenever a rigorous theoretical treatment of a phenomena is not available, semi-empirical and empirical treatments are given.

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takes us inside events of all kinds to show what works, what doesn't, and why. She investigates a wide array of gatherings--conferences, meetings, a courtroom, a flash-mob party, an Arab-Israeli summer camp--and explains how simple, specific changes can invigorate any group experience. The result is a book that's both journey and guide, full of exciting ideas with real-world applications. The Art of Gathering will forever alter the way you look at your next meeting, industry conference, dinner party, and backyard barbecue--and how you host and attend them.

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easy-to-use reproducible student pages, teacher notes, and checkout questions. The labs also support today's standards and will help your students learn the core ideas, crosscutting concepts, and scientific practices found in the Next Generation Science Standards. In addition, the authors offer ways for students to develop the disciplinary skills outlined in the Common Core State Standards. Many of today's middle school teachers—like you—want to find new ways to engage students in scientific practices and help students learn more from lab activities. Argument-Driven Inquiry in Physical Science does all of this while also giving students the chance to practice reading, writing, speaking, and using math in the context of science.

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selection, reactor design and solids handling processes - New sections on fermentation, adsorption, membrane separations, ion exchange and chromatography - Increased coverage of batch processing, food, pharmaceutical and biological processes - All equipment chapters in Part II revised and updated with current information - Updated throughout for latest US codes and standards, including API, ASME and ISA design codes and ANSI standards - Additional worked examples and homework problems - The most complete and up to date coverage of equipment selection - 108 realistic commercial design projects from diverse industries - A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data and Excel spreadsheet calculations plus over 150 Patent References, for downloading from the companion website - Extensive instructor resources: 1170 lecture slides plus fully worked solutions manual available to adopting instructors

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This edition has been compiled in machine-readable form and will be available online.

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NEW YORK TIMES BESTSELLER NATIONAL BESTSELLER In this urgent, singularly authoritative book, Bill Gates sets out a wide-ranging, practical--and accessible--plan for how the world can get to zero greenhouse gas emissions in time to avoid an irreversible climate catastrophe. Bill Gates has spent a decade investigating the causes and effects of climate change. With the help and guidance of experts in the fields of physics, chemistry, biology, engineering, political science and finance, he has focused on exactly what must be done in order to stop the planet's slide toward certain environmental disaster. In this book, he not only gathers together all the information we need to fully grasp how important it is that we work toward net-zero emissions of greenhouse gases but also details exactly what we need to do to achieve this profoundly important goal. He gives us a clear-eyed description of the challenges we face. He describes the areas in which technology is already helping to reduce emissions; where and how the current technology can be made to function more effectively; where breakthrough technologies are needed, and who is working on these essential innovations. Finally, he lays out a concrete plan for achieving the goal of zero emissions--suggesting not only policies that governments should adopt, but what we as individuals can do to keep our government, our employers and ourselves accountable in this crucial enterprise. As Bill Gates makes clear, achieving zero emissions will not be simple or easy to do, but by following the guidelines he sets out here, it is a goal firmly within our reach.

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specific heat worksheet answers: *The Science Teacher* , 1982 Some issues are accompanied by a CD-ROM on a selected topic.

specific heat worksheet answers: *Creations of Fire* Cathy Cobb, Harold Goldwhite, 2013-11-11 the history of chemistry is a story of human endeavor--and as ever T ratic as human nature itself. Progress has been made in fits and starts, and it has come from all parts of the globe. Because the scope of this history is considerable (some 100,000 years), it is necessary to impose some order, and we have organized the text around three dis cemible--albeit gross--divisions of time: Part 1 (Chaps. 1-7) covers 100,000 BeE (Before Common Era) to the late 1700s and presents the background of the Chemical Revolution; Part 2 (Chaps. 8-14) covers the late 1700s to World War I and presents the Chemical Revolution and its consequences; Part 3 (Chaps. 15-20) covers World War I to 1950 and presents the Quantum Revolution and its consequences and hints at revolutions to come. There have always been two tributaries to the chemical stream: experiment and theory. But systematic experimental methods were not routinely employed until the 1600s--and quantitative theories did not evolve until the 1700s--and it can be argued that modern chemistry as a science did not begin until the Chemical Revolution in the 1700s. xi xii PREFACE We argue however that the first experiments were performed by arti sans and the first theories proposed by philosophers--and that a rev olution can be understood only in terms of what is being revolted against.

specific heat worksheet answers: Heat Mike Lupica, 2007-03-01 The #1 Bestseller! Michael Arroyo has a pitching arm that throws serious heat along with aspirations of leading his team all the way to the Little League World Series. But his firepower is nothing compared to the heat Michael faces in his day-to-day life. Newly orphaned after his father led the family's escape from Cuba, Michael's only family is his seventeen-year-old brother Carlos. If Social Services hears of their situation, they will be separated in the foster-care system—or worse, sent back to Cuba. Together, the boys carry on alone, dodging bills and anyone who asks too many questions. But then someone wonders how a twelve-year-old boy could possibly throw with as much power as Michael Arroyo throws. With no way to prove his age, no birth certificate, and no parent to fight for his cause, Michael's secret world is blown wide open, and he discovers that family can come from the most unexpected sources. Perfect for any Little Leaguer with dreams of making it big--as well as for fans of Mike Lupica's other New York Times bestsellers Travel Team, The Big Field, The Underdogs, Million-Dollar Throw, and The Game Changers series, this cheer-worthy baseball story shows that when the game knocks you down, champions stand tall.

specific heat worksheet answers: **CPO Focus on Physical Science** CPO Science (Firm), Delta Education (Firm), 2007

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in the morning/ at the morning/ at morning - WordReference Forums

Oct 2, 2007 · I am afraid your idea that morning is a specific time is wrong. Specific has the meaning of exact or precise or particular. If I say, "I woke up in the morning." You do not know what time I woke up at - was it 6 o'clock, or 8 o'clock or was it 23 minutes past 9 o'clock? 6 o'clock, 8 o'clock and 23 minutes past 9 o'clock are all specific times.

Capitalization when using specific insitutions - WordReference ...

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bank's...

Co., Ltd. and CO LTD - WordReference Forums

May 9, 2011 · Therefore, "Co." sometimes occurs with "Ltd." and sometimes it does not. In referring to a specific company, you should be guided in the use of these abbreviations by the organization itself—its stationery, literature, Web site, etc. Some companies insist on spelling out one or more of these terms in all cases, some do not.

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Mar 23, 2017 · Hi, Please advise, what is the meaning of "disease specific"? Connected with or attributable to disease? What is the opposite? Thanks, A. In Crohn's disease, 25-50% of causes of deaths are disease specific, for example, malnutrition, intestinal cancer, and postoperative complications. In...

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Nov 14, 2017 · But let me try with some sentences about a specific holiday. At Easter, I shop for fancy clothes, decorate the house with flowers, and prepare dyed eggs for the children to find. (Around the time of Easter) On Easter, I go to church in the morning and eat a large dinner in the afternoon. (on Easter Sunday) Thank you so much for your help.

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