

Law Of Conservation Of Energy Worksheet

Conservation of Energy



Name: _____ Date: _____

Conservation of Energy

1. What method of heat transfer does the Sun use to heat the Earth's surface?

- A. conduction
- B. convection
- C. radiation

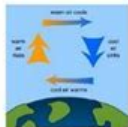


2. Which image correctly shows how the Sun heats the Earth's surface?



3. What method of heat transfer does the Earth's surface use to heat the Earth's atmosphere?

- A. conduction
- B. convection
- C. radiation



4. Which image correctly shows how the Earth's surface heats the Earth's atmosphere?



5. What are the energy transformations that take place in an electric pencil sharpener that is already plugged in?

- A. mechanical to electrical to thermal
- B. electrical to thermal to mechanical
- C. electrical to mechanical to thermal



6. Thermal energy always moves from a _____ temperature to a _____ temperature.

- F. colder, hotter
- G. hotter, colder
- H. thermal energy does not move



7. What will happen to the butter in the experiment?

- A. The butter on the spoon on the right will melt first.
- B. The butter on the spoon on the left will melt first.
- C. The butter on the spoons will melt at the same time.

8. Heated air over a cup of hot cocoa expands and rises and is replaced by cooler, denser air. What method of heat transfer is this?

- F. convection
- G. conduction
- H. radiation



9. What are the energy transformations that take place in your cell phone from the battery to the light being given off by the screen?

- A. electrical to chemical to radiant
- B. radiant to electrical to chemical
- C. chemical to electrical to radiant



10. A rancher heated a piece of metal to make a horseshoe to 120°C and put it into a bucket of water that was 30°C. What is the most likely temperature of the water and the horseshoe in 30 minutes?

- F. The water is 20°C and the horseshoe is 120°C.
- G. The water is 65°C and the horseshoe is 65°C.
- H. The water is 80°C and the horseshoe is 30°C.

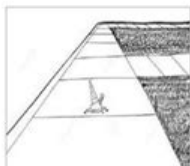
11. Identify the energy transformations that are occurring through an electric fan that is already plugged in.

- A. electrical to mechanical to thermal
- B. electrical to thermal to mechanical
- C. mechanical to electrical to thermal



12. An ice cream has been dropped on a hot sidewalk. How will the heat energy move?

- A. The coldness will move from the sidewalk to the ice cream.
- B. The coldness will move from the ice cream to the sidewalk.
- C. The heat will move from the sidewalk to the ice cream.



13. Which diagram shows the movement of thermal energy through the metal?



14. A method of heat transfer that can occur even if no air is present is called _____.

- A. conduction
- B. radiation
- C. convection

MODIFIED

Law of Conservation of Energy Worksheet: Mastering Energy Transformations

Are you struggling to grasp the Law of Conservation of Energy? Feeling overwhelmed by energy transformations and their calculations? This comprehensive guide provides you with not just a simple understanding of the law, but also a practical, downloadable law of conservation of energy worksheet to solidify your knowledge. We'll break down the concept, provide example problems, and offer tips for tackling even the most challenging energy problems. By the end of this post, you'll confidently apply the Law of Conservation of Energy to various scenarios.

Understanding the Law of Conservation of Energy

The Law of Conservation of Energy is a fundamental principle in physics stating that energy cannot be created or destroyed, only transformed from one form to another. This means the total energy within a closed system remains constant. While energy might change forms – from potential to kinetic, chemical to thermal, etc. – the total amount stays the same. This law underpins countless applications, from designing efficient power plants to understanding the mechanics of a rollercoaster.

Key Concepts to Remember:

Potential Energy (PE): Stored energy due to an object's position or configuration (e.g., gravitational potential energy, elastic potential energy).

Kinetic Energy (KE): Energy of motion, dependent on an object's mass and velocity.

Energy Transformations: The process of energy changing from one form to another (e.g., a falling object converting potential energy into kinetic energy).

Closed System: A system where no energy enters or leaves.

Using the Law of Conservation of Energy Worksheet: A Step-by-Step Guide

The provided law of conservation of energy worksheet (downloadable at the end of this post) will guide you through various problem-solving exercises. Each problem presents a scenario involving energy transformations, requiring you to apply the law to determine unknown quantities. Here's how to approach each problem:

1. Identify the Forms of Energy: Determine the initial and final forms of energy involved in the system. Is it potential energy converting to kinetic energy? Chemical energy to thermal energy? Clearly identifying these forms is crucial.

2. Establish the System: Define the boundaries of your closed system. What objects or elements are included? This helps ensure you account for all energy transformations within the system.
3. Write the Equation: Based on the Law of Conservation of Energy, the total initial energy equals the total final energy. This can be expressed mathematically: $E_{\text{initial}} = E_{\text{final}}$. Substitute the relevant energy formulas ($KE = \frac{1}{2}mv^2$; $PE = mgh$, etc.) into the equation.
4. Solve for the Unknown: Use algebraic manipulation to solve for the unknown variable, whether it's velocity, height, mass, or another energy quantity.
5. Check Your Units: Ensure your units are consistent throughout the calculation and that your final answer has the correct units (Joules for energy).

Example Problem & Solution Using the Law of Conservation of Energy

Let's consider a simple example: A 2 kg ball is dropped from a height of 5 meters. Ignoring air resistance, what is the ball's velocity just before it hits the ground?

1. Energy Forms: Initial energy is gravitational potential energy (PE); final energy is kinetic energy (KE).
2. System: The system is the ball and the Earth.
3. Equation: $PE_{\text{initial}} = KE_{\text{final}} \Rightarrow mgh = \frac{1}{2}mv^2$
4. Solve: We can cancel out the mass (m) from both sides: $gh = \frac{1}{2}v^2$. Solving for v , we get $v = \sqrt{2gh} = \sqrt{2 \cdot 9.8 \text{ m/s}^2 \cdot 5 \text{ m}} \approx 9.9 \text{ m/s}$.
5. Units: The velocity is correctly expressed in meters per second (m/s).

Advanced Applications of the Law of Conservation of Energy

The Law of Conservation of Energy extends far beyond simple falling objects. It's crucial in understanding:

Rollercoasters: The conversion between potential and kinetic energy as the coaster climbs and descends.

Pendulums: The continuous exchange between potential and kinetic energy throughout its swing.

Chemical Reactions: The release or absorption of energy during chemical reactions (exothermic and endothermic reactions).

Electrical Circuits: The transformation of electrical energy into other forms of energy (light, heat, etc.).

Downloadable Law of Conservation of Energy Worksheet

[Insert link to downloadable worksheet here. This should be a PDF or other suitable format containing a series of problems of varying difficulty related to the Law of Conservation of Energy.]

Conclusion

Mastering the Law of Conservation of Energy is essential for understanding a wide range of physical phenomena. By utilizing the provided law of conservation of energy worksheet and following the steps outlined above, you can build a strong foundation in this critical concept. Remember to practice regularly, and you'll confidently solve even the most complex energy problems.

Frequently Asked Questions (FAQs)

1. What happens to energy in a non-closed system? In a non-closed system, energy can be transferred into or out of the system, meaning the total energy within the system is not constant.
2. Can energy be truly lost? No, energy cannot be lost; it is simply transformed into other forms, often less usable forms like heat due to friction.
3. What are some real-world examples of energy conservation? Hybrid cars, solar panels, and energy-efficient appliances all demonstrate principles of energy conservation.
4. How does the Law of Conservation of Energy relate to other laws of physics? It's closely related to the First Law of Thermodynamics, which is essentially the Law of Conservation of Energy applied to systems involving heat.
5. Where can I find more practice problems? Your textbook, online physics resources, and educational websites offer numerous practice problems to further enhance your understanding.

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APlusPhysics: Your Guide to Regents Physics Essentials is a clear and concise roadmap to the entire New York State Regents Physics curriculum, preparing students for success in their high school physics class as well as review for high marks on the Regents Physics Exam. Topics covered include pre-requisite math and trigonometry; kinematics; forces; Newton's Laws of Motion, circular motion and gravity; impulse and momentum; work, energy, and power; electrostatics; electric circuits; magnetism; waves; optics; and modern physics. Featuring more than five hundred questions from past Regents exams with worked out solutions and detailed illustrations, this book is integrated with the *APlusPhysics.com* website, which includes online question and answer forums, videos, animations, and supplemental problems to help you master Regents Physics essentials. The best

physics books are the ones kids will actually read. Advance Praise for APlusPhysics Regents Physics Essentials: Very well written... simple, clear engaging and accessible. You hit a grand slam with this review book. -- Anthony, NY Regents Physics Teacher. Does a great job giving students what they need to know. The value provided is amazing. -- Tom, NY Regents Physics Teacher. This was tremendous preparation for my physics test. I love the detailed problem solutions. -- Jenny, NY Regents Physics Student. Regents Physics Essentials has all the information you could ever need and is much easier to understand than many other textbooks... it is an excellent review tool and is truly written for students. -- Cat, NY Regents Physics Student

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policymakers, and administrators, this second edition is fully updated to account for the needs of K-12 learners in the innovation age. STEM Road Map 2.0 enables educators to implement integrated STEM learning into their classroom without the need for extensive resources, empowering educators and supporting students.

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law of conservation of energy worksheet: Argument-Driven Inquiry in Physical Science

Jonathon Grooms, Patrick J. Enderle, Todd Hutner, Ashley Murphy, Victor Sampson , 2016-10-01 Are you interested in using argument-driven inquiry for middle school lab instruction but just aren't sure how to do it? Argument-Driven Inquiry in Physical Science will provide you with both the information and instructional materials you need to start using this method right away. The book is a one-stop source of expertise, advice, and investigations to help physical science students work the way scientists do. The book is divided into two basic parts: 1. An introduction to the stages of argument-driven inquiry—from question identification, data analysis, and argument development and evaluation to double-blind peer review and report revision. 2. A well-organized series of 22 field-tested labs designed to be much more authentic for instruction than traditional laboratory activities. The labs cover four core ideas in physical science: matter, motion and forces, energy, and waves. Students dig into important content and learn scientific practices as they figure out everything from how thermal energy works to what could make an action figure jump higher. The authors are veteran teachers who know your time constraints, so they designed the book with 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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entered an AQA approval process.

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law of conservation of energy worksheet: Our Solar System Family Chandan Sukumar Sengupta, 2020-02-29 Wonders of the Natural World are in plenty. We may not be able to provide names for all of them. Even exploring them from any close proximity is not possible. There are stars located at a distant place, which is sometimes greater than few hundred light years. We may come to know about their destruction after such time period of light years. Only the closest star, implying adequate influence upon us since beginning, is the sun. Night time sky is dominated by the moon. They are the pair of celestial bodies which often draw attention of people quite frequently. Some of the information about celestial bodies are based on observations made by various instruments deployed for the purpose. Different space mission added some new information to previously presumed ones. Some of the wrong concepts about distantly locates celestial bodies, like Jupiter, Saturn, Uranus and Neptune, were revised for confirming their actual status. There exists another belt of minor planets, located after Pluto, which is the birth place of strange celestial bodies like Comets.

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Diving Operations; and Guidance For Diving In Contaminated Waters , Over 1,000 total pages INTRODUCTION 1-1.1 Purpose. This chapter provides a general history of the development of military diving operations. 1-1.2 Scope. This chapter outlines the hard work and dedication of a number of individuals who were pioneers in the development of diving technology. As with any endeavor, it is important to build on the discoveries of our predecessors and not repeat mistakes of the past. 1-1.3 Role of the U.S. Navy. The U.S. Navy is a leader in the development of modern diving and underwater operations. The general requirements of national defense and the specific requirements of underwater reconnaissance, demolition, ordnance disposal, construction, ship maintenance, search, rescue and salvage operations repeatedly give impetus to training and development. Navy diving is no longer limited to tactical combat operations, wartime salvage, and submarine sinkings. Fleet diving has become increasingly important and diversified since World War II. A major part of the diving mission is inspecting and repairing naval vessels to minimize downtime and the need for dry-docking. Other aspects of fleet diving include recovering practice and research torpedoes, installing and repairing underwater electronic arrays, underwater construction, and locating and recovering downed aircraft.

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