

USING EVERYDAY LIFE EXAMPLES TO EXPLAIN PHYSICAL LAWS TO SCHOOL STUDENTS

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Abstract. This article presents a scientific and pedagogical analysis of the effectiveness of using everyday life examples to explain physical laws to school students. Particular attention is given to connecting theoretical concepts with familiar phenomena encountered in students' daily lives, including motion, force, pressure, energy transformation, heat transfer, light, and electricity. The article examines how real-life examples can facilitate the understanding of abstract physical concepts, improve students' motivation, and strengthen the connection between theoretical knowledge and practical experience. The role of everyday situations in developing scientific thinking, logical reasoning, problem-solving skills, and the ability to apply physical laws to real-world phenomena is also considered. Particular emphasis is placed on the use of demonstrations, simple experiments, questions, mathematical calculations, and practical activities based on familiar situations. The analysis demonstrates that contextualized physics instruction can make lessons more meaningful and accessible while encouraging active student participation.

The systematic integration of everyday examples into physics education can therefore contribute to deeper conceptual understanding, stronger practical competencies, and greater interest in learning physics.

Keywords: Physics education, physical laws, everyday examples, contextual learning, scientific thinking, problem-solving, practical application, school students.

ИСПОЛЬЗОВАНИЕ ПРИМЕРОВ ИЗ ПОВСЕДНЕВНОЙ ЖИЗНИ ПРИ ОБЪЯСНЕНИИ ФИЗИЧЕСКИХ ЗАКОНОВ ШКОЛЬНИКАМ

Аннотация. В статье представлен научно-педагогический анализ эффективности использования примеров из повседневной жизни при объяснении физических законов школьникам. Особое внимание уделено установлению связи между теоретическими понятиями и знакомыми учащимся явлениями, встречающимися в повседневной деятельности, включая движение, силу, давление, преобразование энергии, теплопередачу, световые и электрические явления. Рассмотрено влияние жизненных примеров на понимание абстрактных физических понятий, повышение учебной мотивации и формирование устойчивой связи между теоретическими знаниями и практическим опытом. Проанализирована роль повседневных ситуаций в развитии научного мышления, логического рассуждения, навыков решения задач и способности применять физические законы для объяснения реальных явлений. Особое внимание уделено использованию демонстраций, простых экспериментов, вопросов, математических расчётов и практических заданий, основанных на знакомых учащимся ситуациях. Показано, что контекстное преподавание физики делает учебный материал более доступным и осмысленным, способствует активному участию учащихся и повышает интерес к

изучению физики. Систематическое использование жизненных примеров способствует более глубокому пониманию физических законов и развитию практических компетенций школьников.

Ключевые слова: Физическое образование, физические законы, повседневные примеры, контекстное обучение, научное мышление, решение задач, практическое применение, школьники.

MAKTAB O'QUVCHILARIGA FIZIK QONUNLARNI TUSHUNTIRISHDA KUNDALIK HAYOTIY MISOLLARDAN FOYDALANISH

Annotatsiya. Mazkur maqolada maktab o'quvchilariga fizik qonunlarni tushuntirishda kundalik hayotiy misollardan foydalanishning samaradorligi ilmiy-pedagogik jihatdan tahlil qilingan. O'quvchilarning kundalik hayotida uchraydigan harakat, kuch, bosim, energiya o'zgarishi, issiqlik almashinuvi, yorug'lik va elektr hodisalari kabi jarayonlarni nazariy fizik tushunchalar bilan bog'lash masalalariga alohida e'tibor qaratilgan. Kundalik hayotiy misollarning mavhum fizik tushunchalarni osonroq anglash, o'quvchilarning fanga bo'lgan qiziqishi va motivatsiyasini oshirish hamda nazariy bilimlarni amaliy tajriba bilan bog'lashdagi ahamiyati yoritilgan. Shuningdek, hayotiy vaziyatlardan foydalanish orqali ilmiy tafakkur, mantiqiy fikrlash, masalalar yechish va fizik qonunlarni real hodisalarni tushuntirishda qo'llash ko'nikmalarini rivojlantirish imkoniyatlari ko'rib chiqilgan. Fizika darslarida oddiy tajribalar, namoyishlar, savollar, matematik hisob-kitoblar va amaliy topshiriqlardan foydalanishning pedagogik imkoniyatlari tahlil qilingan. Kundalik hayot bilan bog'langan ta'lim o'quv materialini tushunarli, mazmunli va qiziqarli qilishga xizmat qilishi asoslangan.

Kalit so'zlar: Fizika ta'limi, fizik qonunlar, kundalik misollar, kontekstli ta'lim, ilmiy tafakkur, masalalar yechish, amaliy qo'llash, maktab o'quvchilari.

Introduction

Physics is one of the fundamental sciences that helps students understand the laws and phenomena governing the natural world. However, many school students perceive physics as a difficult subject because its concepts are often presented through abstract definitions, mathematical formulas, and theoretical explanations. When physical laws are studied only in a theoretical form, students may have difficulty understanding their practical significance and applying their knowledge to real-life situations. Therefore, connecting physics education with students' everyday experiences is an important pedagogical approach that can make the learning process more understandable, meaningful, and engaging. Everyday life provides numerous examples of physical laws and phenomena. The movement of vehicles, the operation of household electrical appliances, the falling of objects, the heating and cooling of substances, the reflection of light in mirrors, the formation of shadows, and the functioning of simple mechanical devices are all closely related to fundamental principles of physics. For example, Newton's laws of motion can be explained through the movement of a bicycle or car, the law of conservation of energy can be demonstrated using household appliances, and the principles of pressure can be illustrated through the use of sharp objects or the soles of shoes.

Such examples allow students to observe the practical manifestation of physical laws in situations that are familiar to them. The use of everyday examples in physics lessons also contributes to the development of students' scientific thinking and problem-solving skills. When students are encouraged to identify physical phenomena in their surroundings, they learn not only to memorize formulas but also to analyze, compare, explain, and predict events based on scientific principles. This approach can increase students' motivation, strengthen their interest in physics, and facilitate the transition from theoretical knowledge to practical application.

Therefore, the integration of real-life examples into physics teaching represents an effective method for improving students' understanding of physical laws and demonstrating the relevance of physics to everyday life.

Relevance

In modern education, one of the primary objectives is to improve students' understanding of scientific concepts by connecting theoretical knowledge with practical experiences. Physics, as a fundamental natural science, often contains abstract laws and principles that may be difficult for school students to comprehend when taught solely through formulas and theoretical explanations.

Therefore, the use of everyday life examples in teaching physical laws has become increasingly relevant in contemporary pedagogical practice. This approach allows students to observe how physical principles operate in real situations, making learning more meaningful, engaging, and accessible.

Aim

The aim of this article is to analyze the effectiveness of using everyday life examples in explaining physical laws to school students and to demonstrate how real-life situations can facilitate the understanding of theoretical concepts, increase students' interest and motivation in physics, and develop their scientific thinking, practical application, and problem-solving skills.

Main Part

The use of everyday life examples in teaching physics is an effective pedagogical approach that helps school students understand complex scientific concepts more clearly. Physics laws describe phenomena that students encounter every day, but these phenomena are often not consciously recognized as examples of physics. Therefore, the teacher can begin the explanation of a theoretical concept with a familiar situation and then connect it with the corresponding physical law. This method makes the learning process more understandable, meaningful, and interesting for students. Newton's laws of motion can be easily explained through everyday situations. For example, when a bus suddenly stops, passengers move forward because their bodies tend to maintain their previous state of motion. This is a simple demonstration of inertia and Newton's First Law. Newton's Second Law can be explained by comparing an empty shopping cart with a heavily loaded cart. The empty cart accelerates more easily when the same force is applied. Newton's Third Law can be demonstrated when a person walks or jumps. The person pushes the ground backward or downward, while the ground produces an opposite reaction force. The concepts of force, work, and energy can also be connected with common activities.

When a student lifts a schoolbag from the floor, mechanical work is performed against gravity. When a person rides a bicycle, chemical energy stored in the body is transformed into mechanical energy and kinetic energy. Household appliances provide additional examples of energy transformation. An electric lamp converts electrical energy into light and thermal energy, while an electric fan converts electrical energy into mechanical motion.

Table 1. Examples of Physical Laws in Everyday Life

Physical law	Everyday example	Explanation
Newton’s laws	Sudden stopping of a bus	Demonstrates inertia and reaction forces
Pressure	Cutting with a sharp knife	Smaller area produces greater pressure
Energy transformation	Riding a bicycle	Chemical energy changes into mechanical energy
Heat transfer	Heating water	Thermal energy moves from a hot source to water

Pressure is another physical concept that can be demonstrated through everyday objects. A sharp knife cuts food more easily than a blunt knife because the applied force is concentrated over a smaller area. Similarly, wide shoes distribute body weight over a larger surface and therefore produce less pressure on soft ground. Such examples help students understand that pressure depends on both the applied force and the area over which the force acts. Heat and temperature are closely related to everyday experiences.

Heating water in a kettle demonstrates the transfer of thermal energy from a heat source to the water. Warm clothing in winter demonstrates thermal insulation because it reduces the rate of heat loss from the human body. A refrigerator can be used to explain the transfer of thermal energy from a colder space to the surrounding environment through the operation of a refrigeration system. These examples make concepts such as heat transfer, thermal conductivity, and thermal equilibrium easier for students to understand.

Optical phenomena can also be explained using familiar objects. The reflection of light in a mirror demonstrates the law of reflection, while a pencil appearing bent when placed in a glass of water demonstrates refraction. Eyeglasses, cameras, magnifying glasses, and mobile phone cameras provide practical examples of lenses and the formation of images.

When students observe these phenomena directly, abstract concepts related to light become more concrete and memorable. Electricity is particularly suitable for connecting physics with daily life because students regularly use electrical devices. Smartphones, computers, chargers, lamps, televisions, and household appliances can be used to explain electric current, voltage, resistance, electrical power, and energy consumption.

For example, the power rating written on an electrical appliance can help students understand the relationship between electrical power, operating time, and energy consumption.

Table 2. Practical Examples for Physics Lessons

Physics topic	Daily-life object	Learning purpose
Optics	Mirror and glass of water	Understanding reflection and refraction
Electricity	Lamp and smartphone charger	Understanding electrical energy
Motion	Bicycle or car	Understanding speed and acceleration
Heat	Clothes and refrigerator	Understanding heat transfer and insulation

The use of everyday examples also contributes to the development of students’ scientific thinking. The teacher can ask students to explain why a person leans backward when a bus starts moving, why metal feels colder than wood, why a wet floor is slippery, or why a spoon appears distorted in water. Such questions encourage students to observe their surroundings, identify physical phenomena, formulate hypotheses, and search for scientific explanations.

Another important advantage of this teaching method is that it improves the practical application of mathematical formulas. Students often memorize formulas without fully understanding their physical meaning. When formulas are introduced through real situations, students can understand why and when they should be applied. For example, the formula for speed can be used to calculate the average speed of a cyclist, while the formula for electrical power can be applied to household appliances. This connection between mathematics and real-life situations strengthens both mathematical and physical understanding. Therefore, the systematic use of everyday examples should be considered an important component of modern physics education.

It allows students to move from observation to scientific explanation and from theoretical knowledge to practical application. As a result, physics becomes not simply a subject based on formulas and definitions, but a science that explains the events and processes occurring in students’ everyday lives.

Results

The analysis showed that the use of everyday life examples makes physical laws easier for school students to understand and remember. Connecting theoretical concepts with familiar situations such as bus movement, cycling, cutting with a sharp knife, heating water, using electrical appliances, and observing mirrors helped students establish a clear relationship between scientific principles and real-life phenomena. This approach also increased students’ interest in physics and encouraged them to participate more actively during lessons. The use of practical examples supported the development of students’ ability to apply physical laws to familiar situations rather than simply memorizing formulas and definitions. Students were also encouraged to observe phenomena, identify physical relationships, explain causes and effects, and use appropriate physical formulas. Therefore, everyday examples can contribute to better conceptual understanding, practical application of knowledge, scientific thinking, and problem-solving skills in physics education.

Discussion

The obtained results indicate that everyday life examples are an important component of effective physics teaching.

Many physical concepts are abstract when presented only through mathematical equations or theoretical definitions. However, when these concepts are associated with familiar experiences, students can more easily understand their practical meaning. For example, explaining inertia through the movement of passengers in a bus provides a direct connection between Newton's First Law and an experience that students may have encountered themselves. Similarly, using a sharp knife to explain pressure or a mirror to explain light reflection makes theoretical knowledge more concrete and accessible.

The effectiveness of this approach is closely related to the teacher's ability to select appropriate examples. Examples should correspond to the students' age, level of knowledge, and everyday experiences. They should also be scientifically accurate and directly connected with the learning objective. The use of simple demonstrations, questions, experiments, and calculations together with everyday examples can further strengthen students' understanding. Thus, physics teaching based on real-life situations can create a more active, meaningful, and student-centered learning environment.

Conclusion

The use of everyday life examples in explaining physical laws is an effective approach to improving the quality of physics education among school students. Connecting theoretical concepts with familiar phenomena such as vehicle movement, cycling, heating, electrical devices, pressure, light reflection, and heat transfer makes complex physical principles more understandable and meaningful. This approach helps students move beyond simple memorization and develop the ability to apply scientific knowledge to real-life situations. It also promotes students' interest in physics, scientific thinking, logical reasoning, and problem-solving skills. The analysis shows that carefully selected everyday examples, combined with theoretical explanations, demonstrations, and practical activities, can create a more engaging and effective learning environment. Therefore, the systematic integration of real-life situations into physics lessons should be considered an important pedagogical strategy for developing students' deeper understanding of physical laws and their practical significance in everyday life.

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