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TEACHING «PROFESSIONAL-ORIENTED FOREIGN LANGUAGE» FOR STUDENTS OF PHYSICS DEPARTMENTS

This article gives examples of tasks and activities aimed at expansion and consolidation the professional vocabulary, which can be used at English language lessons for students of the physics department. The use of different types of tasks at English language lessons allows students to get acquainted with the necessary professional vocabulary, develop skills in reading and translating technical literature, improve the skills in perception of scientific and technical English language, develop dialogue and monologue speech. One of the most important goals that universities of Kazakhstan try to get is the training professional specialists who are able to compete with foreign colleagues in the international labor market. To achieve this goal, university graduates are required to speak English at the appropriate level. Teaching the discipline «Professionally-oriented foreign language» at the physics department and using the variety of tasks and activities at English language lessons allows students to become highly qualified specialists in their field. The methodology of teaching English to students of physics and technical specialties is being developed precisely in this direction, the integration of the linguistic and professional spheres.

Key words: professional development, professional vocabulary, communicative competence, training specialists, solving problems in physics, discussion physic laws, physical phenomena.

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Физика-техникалық факультетінде «Кәсіби бағытталған шет тілі» пәнін оқыту

Бұл мақалада физика-техникалық факультетінің студенттері үшін ағылшын тілі сабақтарында қолдануға болатын кәсіби лексиканы кеңейтуге және бекітуге бағытталған тапсырмалар үлгілері берілген. Ағылшын тілі сабақтарында әр түрлі тапсырмаларды қолдану техникалық әдебиетті оқу және аудару дағдыларын дамытуға, кәсіби лексика арқылы сөздік қорын кеңейтуге, ғылыми тілде сөйлеуді қабылдау дағдыларын жетілдіруге, диалогтық және монологтық сөйлеуді дамытуға мүмкіндік береді. Қазақстанның жоғары оқу орындары шешетін маңызды мәселелердің бірі Халықаралық еңбек нарығында шетелдік әріптестермен бәсекелестікке төтеп бере алатын кәсіби мамандарды даярлау болып табылады. Осы мақсатқа жету үшін ЖОО-ның түлектері ағылшын тілін тиісті деңгейде меңгеруі тиіс. Физика-техникалық факультетінде «Кәсіби бағытталған шет тілі» пәнін оқыту және ағылшын тілі сабақтарында түрлі тапсырмаларды қолдану студенттерге өз ісінің білікті, сұранысқа ие мамандары болуға мүмкіндік береді. Физика-техникалық мамандықтар студенттеріне ағылшын тілін оқыту әдістемесі дәл осы бағытта, тіл және кәсіби саланы біріктіруде әзірленеді.

Түйін сөздер: біліктілікті арттыру, кәсіби лексика, коммуникативтік құзыреттілік, мамандарды даярлау, физика бойынша есептерді шешу, физика бойынша заңдарды талқылау, физикалық құбылыстар.

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Преподавание дисциплины «Профессионально-ориентированный иностранный язык» на физико-техническом факультете

В данной статье приведены образцы заданий, направленных на расширение и закрепление профессиональной лексики, которые можно использовать на уроках английского языка для студентов физико-технического факультета. Использование разных видов заданий на уроках английского языка позволяет развить навыки чтения и перевода технической литературы, расширить словарный запас за счет профессиональной лексики, усовершенствовать навыки восприятия научной речи на языке, развить диалогическую и монологическую речь. Одной из важнейших проблем, которую решают вузы Казахстана, является подготовка профессиональных специалистов, способных выдержать конкуренцию с зарубежными коллегами на международном рынке труда. Для достижения этой цели выпускники вузов обязаны владеть английским языком на соответствующем уровне. Преподавание дисциплины «Профессионально-ориентированный иностранный язык» на физико-техническом факультете и использование разнообразных заданий на уроках английского языка позволяют студентам стать высококвалифицированными, востребованными специалистами своего дела. Методика обучения английскому языку студентов физико-технических специальностей разрабатывается именно в этом направлении, интеграции языковой и профессиональной сферы.

Ключевые слова: повышение квалификации, профессиональная лексика, коммуникативная компетенция, подготовка специалистов, решение задач по физике, обсуждение законов по физике, физические явления.

Introduction

Kazakhstan education system has been making a lot of efforts in recent years for getting its positions in world market of educational services. Nowadays a lot of changes are taking place in the sphere of educational services in Kazakhstan. Ministry of Education and Science of Kazakhstan is planning step by step transition of teaching four subjects – physicist, chemistry, biology and computing in English language for 10 and 11 classes.

In 6-7 years all technical subjects in Kazakhstan will be taught in English. Teaching subjects in English will increase prestige and competitiveness of particular educational institutions in Kazakhstan.

In order to be ready to teach subjects in English all teachers should start learning English language and start teaching the subjects in English today. In addition, Pedagogical Universities should prepare thousands of specialists who will be able to teach subjects in English.

A demand for physics teachers knowing English language increases every year. Important sign of today is also that students have come to understand the need for learning foreign languages. The physics department of Al-Farabi Kazakh National University also takes part in preparing physics teachers knowing English language. During teaching professionally oriented language for students of physics departments is very effective using different types of task for making lessons interesting and motivate students to learn English language, develop the cognitive independence of the learners and help students to become an active participant in the educational process.

Experiment

Asking students of physics department what kind of tasks and materials they like in studying physics in English language I have revealed some useful resources and tasks for students of physics department. There are some examples of tasks in English language directed to expansion and revision of professional knowledge of students of physics department.

Task 1: Students try to find answers to different questions on physics and try to give explanation to different physics phenomena. At the end of the task students learn new words on physics and be able to explain different physics phenomena.

Question 1: We cannot make water hotter when it is boiling. Why?

Answer: When water is boiling, you can make it hotter, but not as a liquid. We cannot make water hotter than a hundred degrees, because it will turn into water-vapor. But it is quite possible to make water-vapor hotter than the temperature of boiling water.

If we go on boiling water, we are putting heat into it. We must not think that if the water cannot become hotter, the heat is lost. No. The heat goes into water, and the water takes the form of a gas, and the heat still remains. Though the heat is not making water hotter, it makes the water-vapor hotter.

One the other hand, we must always remember that the boiling point of water depends on air pressure. On the top of a high mountain, where the air pressure is less, the water boils at a lower temperature. At the Dead Sea, which is more than two thousand feet below sea-level, and where the air pressure is greater, the boiling point of the water is higher

Question 2: A full bottle keeps heat longer than a bottle which is half full. Why?

Answer: A bottle full of hot water contains more heat than a bottle which is only half full. Different things take different amounts of heat to be raised to the same temperature.

Let us take some water and the same amount of anything else in the world, and make them five degrees hotter than they were before. We find that we have to put more heat into the water than into the other things.

Question 3: What makes a soap bubble rise and fall? If a soap bubble does not burst too soon, it will begin to fall. Why?

Answer: If we want to explain this, we must remember a balloon which is filled with hot air. It rises for some time and then it falls again. A balloon rises because the hot air inside it is lighter than the air round it; and as it is lighter, it must rise. When the air inside a balloon cools, the weight of the balloon itself makes it fall.

A soap bubble is really a little balloon filled with hot air. The air which fills a soap bubble is warm air from our lungs. This air is much lighter than the air outside. It goes out of our lungs with such force that it can carry the weight of the water which makes the skin of the soap bubble.

But this cannot last for a long time, because the skin of a soap bubble is very thin. So the heat inside a soap bubble soon escapes, and the bubble becomes as cool as the air around it, and it begins to fall.

Question 4: A man taps the wheels of a train at the station. Why?

Answer: The men who tap the wheels of trains at the station must see that none of the wheels are defective before the train goes on.

If the wheel is good, it gives out a clear, ringing sound. But if the wheel is broken, it gives out a cracked sound when a man taps it.

So the men who tap the wheels are able to discover very quickly which wheel is good, and which is bad, and we may say that their work is very important

Question 5: Iron seems colder than wood. Why?

Answer: When we touch a cold or a hot thing, our feeling does not always depend on how cold or hot the thing really is. The pen and the pencil on your table are both of the same temperature, but the pen seems to you much colder than the pencil. All the parts of a hammer are of the same temperature, but the iron part of it seems much colder than the wooden part.

In all these cases the thing which we touch is colder than our skin. So the heat goes from our skin into that thing. Our feeling depends on the fact how quickly the thing takes heat from our fingers.

Iron takes heat quickly from our fingers; it makes our fingers cold, and so we say that it is cold. But wood does not take heat away so quickly from our fingers, and we say it is not so cold.

So we must say that iron is a good conductor of heat, and wood is a bad conductor.

Question 6: Your face turns pale when you are frightened. Why?

Answer: The skin of our faces has a certain colour. But the main part of the colour of the face is the colour of the blood shining through the skin.

When a person is frightened, the brain sends impulses to the blood-vessels of the face which become constricted and allow very little blood to pass through the skin of the face. So we see that the face is almost white. But your face may turn pale not only when you are frightened. Bad air, for example, can make your face turn white, too. When a person`s face becomes very pale, we must understand that he may faint. If not enough blood is passing through his face, not enough blood may pass through his brain, because the blood-vessels of the brain may be constricted too.

Question 7: Why do we put a spoon in a glass before we pour hot water into it?

Answer: When we pour hot water into a glass, the heat may sometimes expand inside of the glass too quickly and break the glass.

A spoon is a good conductor, and if we put it in the glass, it takes some of the heat from the water. The best spoon for this is silver or copper. But any spoon will be good, because all metals are good conductors of heat.

Question 8: What makes the wind whistle?

Answer: It not so easily notice the whistling and all other sounds which the wind makes when we are out of doors. But we easily notice all these sounds when we are in a house.

Why? Because when the wind blows through chinks of doors and windows, it meets all kinds of things. The wind makes these things tremble, vibrate and produces all kind of sounds. Sometimes people are frightened by these noises. But if they go out of door into the wind, they will not hear the whistle so well, because what our ears can hear is not the wind, but the sounds which are made by trembling and vibrating (Perelman, 1980).

Task 2: Students prepare interesting information, relating to the Earth, the Moon, planets, stars and gravitation. They try to master the subject astronomy and find answers to interesting facts that happen day by day.

For example:

1. Why doesn't the Moon fall onto the Sun?
2. Why is there no air on the Moon?
3. Why do astronomers observe eclipse?
4. Why do stars look like stars?
5. What constellations can we see in the sky?
6. What is inside the Earth? (Perelman, 1980).

Task 3: Students try to solve problems in physics and give the detailed analysis of the results. At the end of the task student learn new words on physics and be able to give detailed solutions and explanations to different physics problems.

Problem 1: Determine the mean distance between the Earth and the Moon if the electromagnetic signal sent to the Moon from the Earth returns in 2.56 s. What is the mean velocity of the moon round the Earth if the sidereal month is 27.3 days long?

Solution: A ratio signal sent to the Moon will be reflected by its surface and return to the Earth. We know the time in which the ratio signal covers twice the distance from the Earth to the Moon. Therefore

$$d = \frac{ct}{2}, d = \frac{300000\ {}^{km}/_{s} \times 2.56\ s}{2} \cong 384380\ km.$$

In order to determine the mean orbital velocity of the Moon around the Earth we use the formula $\bar{v} = 2\,{}^{\pi d}/_{T}$, where T is the sideral month, i.e. the time taken by the Moon to complete one revolution around the Earth relative to the stars. Substituting the numerical values, we obtain

$$\bar{v} = \frac{6.28 \times 3.84 \times 10^5\ km}{27.3 \times 24 \times 3600\ s} \cong 1.02\ {}^{km}/_{s}.$$

Answer: The approximate distance between the Earth and the Moon is 384380 km. The mean orbital velocity of the Moon is 1.02 km/s.

Problem 2: Determine the ratio of the mass of the Sun to the mass of the Earth if the period of revolution of the Moon round the Earth is 27.2 days and the mean distance from the Earth to the Moon is 384000km.

Given: T_{Moon} = 27.2 days is the period of revolution of the Moon round the Earth, $a_{Moon} = 3.84 \times 10^8$ km is the mean distance from the Earth to the Moon, and T_{Earth} = 365 days is the period of revolution of the Earth round the Sun. From tables, we take the mean distance from the Earth to the Sun $a_{Earth} = 1.5 \times 10^8$ km.

Find: the ratio between the mass of the Sun and the mass of the Earth,

$${}^{m_{Sun}}/_{m_{Earth}}.$$

Solution: We shall use the formula for the refined version of Kepler's third law:

$$\frac{m_{Sun}+m_{Earth}}{m_{Earth}+m_{Moon}}\frac{T_{Earth}^2}{T_{Moon}^2} = \frac{a_{Earth}^3}{a_{Moon}^3}.$$

Since the mass of the Moon relative to that of the Sun and the mass of the Moon relative to the mass of the Earth are negligibly small, we can rewrite the formula sa follows:

$$\frac{m_{Sun}+m_{Earth}}{m_{Earth}+m_{Moon}}\frac{T_{Earth}^2}{T_{Moon}^2} = \frac{a_{Earth}^3}{a_{Moon}^3}.$$

Hence

$${}^{m_{Sun}}/_{m_{Earth}} = \frac{a_{Earth}^3}{a_{Moon}^3} \times \frac{T_{Moon}^2}{T_{Earth}^2}.$$

Substituting in the numerical values, we obtain

$$\frac{m_{Sun}}{m_{Earth}} = \frac{(1.5 \times 10^8\ km)^3 (27.2\ days)^2}{(3.84 \times 10^5\ km)^3 (365\ days)^2} = 330000$$

Answer: The ratio between the masses of the Sun and Earth is about 330000 (Gladkova, 1989).

Task 4: Students prepare presentations to topics, related to elementary physics: Kinematics, Dynamics, Statics, Work, Power, Energy, Mechanical oscillation, Mechanical waves,

Mechanics of liquids, Molecular physics, Mutual conversion of liquids and gases, Properties of liquids, Static electricity, Electric current in various media, Magnetism, Mirrors and lenses (Amirov, 2012).

Task 5: Find out the best student who knows physics laws. Students give explanation to different physics laws.

1. What is the first law of motion? – Body continues to state in rest or continues uniform motion, in a straight line unless compelled to change that state by some external force.

2. What is the third law of motion? – Action and reaction are equal and opposite in direction.

3. What is kinetic energy? – Energy of motion; i, e. the power of doing work that a body has by virtue of its motion. For example: the energy of running water.

4. What is potential energy? – Energy of position; i. e. the power of doing work that a body has by virtue of its position. For example: the energy of a head of water (Ahmet, 2014).

5. How are these varieties of energy related? – They are mutually convertible. Either may be converted into an equivalent amount of the other.

6. What is a pendulum? – A weight suspended so as to be able to swing to and fro.

7. What is an oscillation? -The motion from one end of the arc to the other.

8. What is Archimede's principle? --A body's loss of weight when immersed in a fluid equals the weight of the fluid which it displaces, i. e., it equals the weight of a like volume of the fluid.

9. What are the laws of boiling?

Under a constant pressure, every liquid begins to boil at a certain temperature which is invariable for the given substance.

10. How is light propagated? --In straight lines, as long as it travels in a homogeneous medium.

11. What is a transparent body? --One that transmits light so freely that objects may be distinctly seen through it.

12. What is an opaque body? --One that does not transmit light.

13. What is the cause of a rainbow? --The refraction, reflection and dispersion of sunlight by rain- drops.

14. What is the first law of magnetic poles? --Unlike poles attract each other; like poles repel each other (Irfan P, 2014).

Task 6: Students search the web and find answer to questions:

a) What are the advantages and disadvantages of using nuclear power?

b) Applications of nuclear energy.

c) Describe the advantages of using new types of reactors.

d) What new conducting, semiconducting, magnetic and other types of materials do you know?

e) Describe the advantages of using new types of materials.

f) Using Internet resources find legends about constellations and retell them.

Task 7: Students show some experiments and answer the question:

What do the experiments show?

Experiments:

1. Light and colour – Spinning disk – When you spin the disc, these colours will mix together to produce white.

Spin the disc as quickly as possible. The colours merge together and the disc looks almost white.

2. Gases and Heat – Gases expand a lot when they are heated, and contract a lot when cooled.

Place the balloon in a large vessel of hot water. The balloon starts inflating and eventually stands up right as the air inside the bottle expands.

3. Centripetal force – Can you turn a bucket of water upside-down without the water falling out? You can with the help of centripetal force.

4. How can you take the coin from the bowl with water without getting your fingers wet? – Put the coin into the bowl. Pour water into the bowl so it covers the coin. Carefully place the warm jar upside-down near the coin.

5. How can you lift the small pieces of paper with the help of a balloon? – The balloon sticks the small pieces of paper if you rub it against your sleeve, because it becomes charged (Glencoe, 2010).

Task 8: Students act out the roles based on the given conversation and use new vocabulary of the lesson.

B: Excuse me, I brought my television here to be fixed, is it ready yet?

A: Well, I'm afraid I have some bad news. Your TV has heat stress damage

B: What's that?

A: It's caused by heat from the power supply

B: What could have caused it?

A: Have you left your TV on for any long periods of time?

B: Well, yes I went away for a long weekend and forgot to turn it off, it was on for four days.

A: That'll be what caused the damage.

B: Really?

A: Yes. You shouldn't put that much heat stress on your electrical equipment.

B: So, can you repair it?

A: I can repair it. It just needs some new components (Evans, 2015).

Task 9 – Read and translate the Russian sentences into English and then give their Russian version again

Russian version	English version
Магнитная левитация Если мы поднесем северный полюс постоянного магнита к северному же полюсу другого такого же магнита, магниты будут отталкиваться друг от друга. (Если мы перевернем один из магнитов и поднесем его южным полюсом к северному полюсу другого, два магнита будут притягиваться.) Этот же принцип — то, что одноименные полюса магнитов отталкиваются, — можно использовать для подъема с земли огромных тяжестей. Уже сейчас в нескольких странах идет строительство технически передовых поездов на магнитной подвеске. Такие поезда проносятся не по путям, а над ними на минимальном расстоянии; на весу их удерживают обычные магниты. Поезда как бы парят в воздухе и могут благодаря нулевому трению развивать рекордные скорости.	Magnetic levitation If we place two bar magnets next to each other with north poles opposite each other, the two magnets repel each other. (If we rotate the magnet, so that the north pole is close to the other south pole, then the two magnets attract each other.) This same principle, that north poles repel each other, can be used to lift enormous weights off the ground. Already several nations are building advanced magnetic levitation trains (maglev trains) that hover just above the railroad tracks using ordinary magnets. Because they have zero friction, they can attain record-breaking speeds, floating over a cushion of air (Michia Kaku, 2017).
Описание природы Газ, да и вообще *любое* вещество, есть мириады движущихся частиц. Все то, что мы наблюдали, стоя на морском берегу, можно сразу объединить в единое целое. Во-первых, давление: оно возникает вследствие столкновений атомов с препятствиями, или с чем бы то ни было; медленное течение атомов, если все они в среднем движутся в одном направлении, есть ветер; *хаотичные* внутренние движения — это теплота. Есть волны избыточного давления, где собирается слишком много частиц, и потому они, устремляясь вперед, сдавливают другие частицы, и так далее. Эти волны избыточного давления есть *звук*. Понять все это было немаловажным достижением.	Description of nature Gas, and indeed all matter, is a myriad of moving particles. Thus many of the things we saw while standing at the seashore can immediately be connected. First the pressure: this comes from the collisions of the atoms with the walls or whatever; the drift of the atoms, if they are all moving in one direction on the average, is wind; the random internal motion are the heat. There are waves of excess density, where too many particles have collected, and so as they rush off they push up piles of particles father out, and so on (Feynman, 2011).
Картина мира Около 340 г . до н. э. древнегреческий философ Аристотель написал сочинение «О небе», где привел веские аргументы в пользу того, что Земля скорее является сферой, а не плоской плитой.Одним из аргументов стали затмения Луны. Аристотель понял, что их вызывает Земля, которая, проходя между Солнцем и Луной, отбрасывает тень на Луну. Аристотель заметил, что тень Земли *всегда* круглая. Так и должно быть, если Земля — сфера, а не плоский диск. Имей Земля форму диска, ее тень была бы круглой не всегда, но только в те моменты, когда Солнце оказывается точно над центром диска. В остальных случаях тень удлинялась бы, принимая форму эллипса (эллипс — это вытянутая окружность).	Our picture of the Universe As long ago as 340 BC the Greek philosopher Aristotle, in his book On the Heavens, was able to put forward two good arguments for believing that the earth was a round sphere rather than a flat plate. First, he realized that eclipses of the moon were caused by the earth coming between the sun and the moon. The earth's shadow on the moon was always round, which would be true only if the earth was spherical. If the earth had been a flat disk, the shadow would have been elongated and elliptical, unless the eclipse always occurred at a time when the sun was directly under the center of the disk (Stephen Hawking, 1998).

Task 10: Physics tests – For each question select the one choice in the set best answers the question and give the explanation to you choice.

1. An object is observed to have zero acceleration. Which of the following statement is correct?

a) The object may be in motion. b) The object must be at rest.

c) The object must have zero net force acting on it. d) Both a) and c) are correct. e) None of the above is correct.

Answer: d) F=ma – Acceleration measures the rate of change of velocity. The fact that the acceleration is zero does not necessary mean that the velocity is zero. Therefore a) is correct. If the acceleration is zero, the net force acting on the object is zero. Therefore c) is correct.

2. A beam of parallel rays is reflected from a smooth plane surface. After reflection the rays will be

a) converging b) diverging c) parallel d) diffused e) focused

Answer: c) – That the rays will be parallel follows from the fact that all the angle of reflection will be equal (Herman, 2010).

Task 11: Look carefully at the information in the Table 1. Comment on the trends of energy consumption shown in the table.

Table 1 – Carbon dioxide emissions: major EU countries

Million tonnes CO2			
	1980	1986	1989
United Kindom	528.7	525.9	530.1
Belgium	120.0	95.4	99.1
France	459.2	353.2	360.6
Germany	767.5	675.3	647.9
Italy	355.5	343.2	343.2
Spain	196.2	176.1	176.1
European Community	2747.1	2492.0	2562.9

Answer: This table shows CO2 emission and compares different European community countries over three different years, the first column is 1980, the middle column is 1986 and the last one is 1989. If we look at the total we see that emission of CO2 actually fell from 2747.1 million tonnes in 1980 to 2492 million tonnes in 1986. That trend was not continued as the figure rose again to 2562.9 in 1989. The other striking observation from this table is the heavy contribution to CO2 emission from Germany and Britain. German emission were at least falling but in 1989 stood at 647.9 million tonnes. The most impressive fall is in France, from 459.2 to 360.6 much lower than either Germany or Britain (Kovalenko, 2015).

Task 12: What video materials on physics and discuss them.

A) Go to the site https://www.khanacademy.org and watch video materials about Newton's laws of motion, work and energy, waves and sounds, electric charges and electric force, thermodynamics, magnetic forces, geometric optics, quantum physics and so on. After watching the video materials answer the questions: «What does the video show?» and «What physics laws are described in the video?» (Khan Academy: https://www.khanacademy.org/science/physics).

b) Go the site http://www.physics.org/index.asp and watch physics experiments. After watching video materials try to explain the experiments and answer the question «How does it work?» Find answers to different questions on physics: How does an artificial heart work? How do mobile phones work? How does physics help sport? Why is the sky blue? Can we control lightning? How is physics used in archaeology? How does a fridge work? (Your guide to physics on the web: http://www.physics.org/index.asp).

Results and discussion

Using different forms of educational activity as translation texts on the specialty, preparing presentations on professionally important topics, writing summary of research results in articles or reports in a foreign language etc., begin to dominate at language lessons depending on the content of the professional activity. The use of such diverse tasks makes it possible to effectively form the language and speech competence required for the subsequent use of English in a professional environment. Tasks given at this article are used at professionally oriented foreign language lessons for students of physics department and at the end of the tasks students are able to:

– use active vocabulary on their specialty;
– make up questions on physics and answer the them;
– read formulae and solve physics problems;
– understand and translate texts on physics;
– discuss different physics phenomena;
– explain physics problems on different branches of physics;
– select the right answer and explain the physics test;
– search the web and find necessary information on physics;
– prepare presentations on physics and talk in front of the class;
– give instructions and perform experiments on physics;
– give definitions to physics terms;
– understand video materials on physics and write lectures on physics;
– describe different diagrams, table, charts and make conclusion;
– give explanation to different physics laws and etc.

Conclusion

Teaching physics in English language is a promising direction in the development of education system in Kazakhstan. The important steps should be done in teaching English language to physics teachers and preparing educational-methodical complexes and new textbooks on physics in English language. Teaching physics in English language is possible due to different internet resources which are helpful in studying and teaching the subject. Thus, using different materials and textbooks allows students to find answer to different questions on physics and accumulate new vocabulary needed in their own field in order to be able to communicate effectively in the target situation, develop the language skills they need to succeed in professional work situations.

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