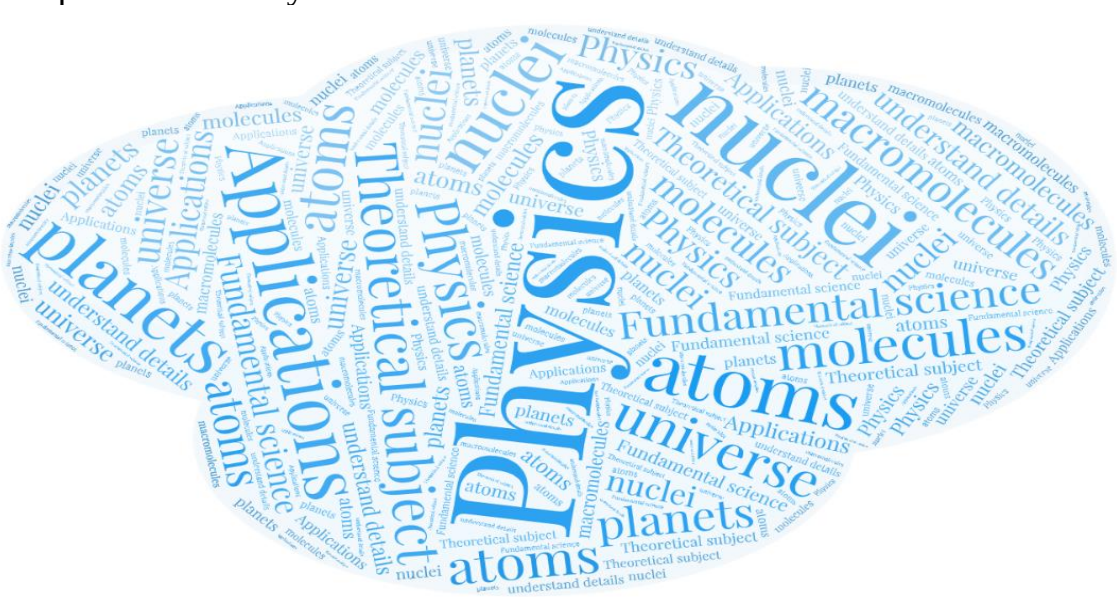
Week1.1 physics **WHY STUDY PHYSICS?**

Lead-in. WHY STUDY PHYSICS? Work in small groups. Find words in the word cloud to answers the question. Write your answer below.



Task 1. Compare your text with the text below. How different are they?

WHY STUDY PHYSICS?

(A) Physics is the most basic and fundamental of all the sciences. Studying physics means trying to understand how things work, in every detail and at the deepest level. This includes everything from elementary particles, nuclei, atoms, molecules, macromolecules, living cells, solids, liquids, gases, plasmas, the atmosphere to living organisms, the human brain, complex systems, supercomputers, planets, stars, galaxies and the universe itself. Physics has the reputation of being a difficult subject to master but there are a number of reasons why it is a good idea to do a course in physics.

Task 2. Read the answers to the question "***Why did you choose physics?***" posted on one of the ***Physics forums*** for students majoring in physics. <u>Which answer is close to you?</u>

I did not choose physics. Physics chose me! ((

Physics offers something that other theoretical subjects cannot - you can see real life applications of it directly.

I've wanted to study physics for almost as long as I can remember. I love the feeling of solving a really tough problem. Especially, when I'm puzzling over it for a while, then I get the A-HA! moment. That's a great feeling!

To me, it represents purity of thought. No religion, no politics, no psychology...

Physics is "poetry." =) It cleanly explains the things that constantly happen around us. The word 'physics' electrifies my soul! Physics gives meaning and insight to the world around us.

I consider physics the most fundamental of sciences. I had a reasonable aptitude for it. I think I have a passion for research.

- How would ***you*** answer this question?
- Why did **you** choose to do a physics course at university?

Task3. Before you read the text, answers the questions.

- What are the differences between TERMS and GENERAL SCIENCE WORDS?
- Which of them are terms and which are general science words?

electricity, systems, liquids, gases, technology, measure, atoms, planet, sound, optics

Scan the Text (A-F) to highlight Terms in Physics. There are examples are done for you.

(B) For one thing, most modern technology involves physics. Any technology involving electricity, magnetism, force, pressure, heat, light, energy, sound, optics, etc., comes from physics. Indeed, physics lies in the basis for all types of analytical and measuring systems. Even though the basic knowledge required for products like fertilizers, drugs, plastics, and chemicals comes from chemistry and biology, these items have to eventually be manufactured, and manufacturing is dominated by physics-based technology. So, it is evident that an understanding of physics leads to a better understanding of almost any other science.

(C) The discipline of physics also teaches skills that are transferable to a great number of professions. These skills include: problem solving, mathematical modeling, designing and performing experiments, interpretation and analysis of experimental data as well as project planning, report writing and presentation.

(D) Moreover, studying physics opens doors to a wide variety of careers. Physicists are engaged in all sorts of interesting jobs because of their broad training and adaptability. As a working physicist you may find yourself trying to predict the stock market on Wall Street, testing satellites for space missions, developing new materials for industry, developing new electronic devices and components, doing medical physics in a hospital, teaching the next generation of physicists at high school, trying to predict the next major earthquakes around the globe, developing flight simulation software, optimizing industrial manufacturing or transformation processes, developing a new measurement instrument, performing materials testing and characterization for special applications, launching a new software company or product, performing urban planning and optimization, etc.

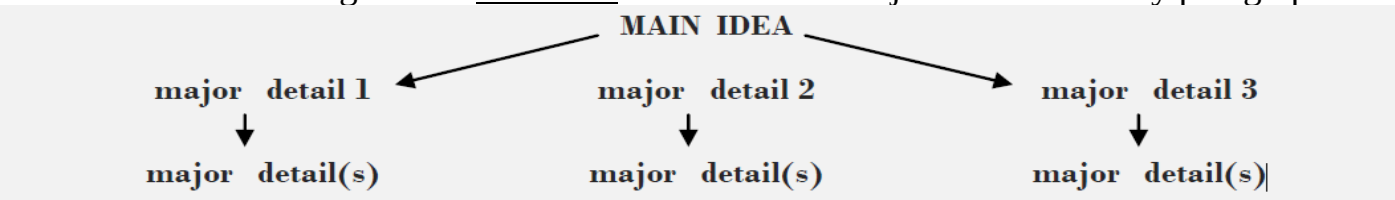
(E) Apart from that, knowledge of physics is helpful for understanding the arts. Physics is the science of sound and is needed to understand how musical instruments work. It is also the science of light and is a key to understanding visual artwork including paintings, photograph as well as stage lighting and filmmaking.

(F) All in all, physics is central to the economy of a great number of countries around the globe. Whether through the application of novel research and technologies, or through the skills and abilities of physics-trained workers, physics drives businesses and innovation.

Task 4. Practice the pronunciation of these terms and general science words? Add some more words' transcripts from the text you have read.

1 nucleus/nuclei	['nju:klɪəs] ['nju:klɪaɪ]	**2** electricity	[ɪˌlek'trɪsətɪ]	**3**	['ɪn(t)strəmənt]
4	['meʒəmənt]	**5**	['kwɔntəm]	**6**	[ˌfʌndə'ment(ə)l
7		**8**	['sɪstəm]	**9**	[kəm'pəʊnənt]
10		**11**		**12**	['mægnətɪz(ə)m]

Task5. Read the text again and underline main idea and major details in every paragraph.



Task 6. Work in six groups. Each group, complete the chart to sum up the information from each Paragraph. Use the chart as an outline. Then exchange your charts for peer-reviewing.

Topic	**WHY STUDY PHYSICS?**
Main idea	
Major detail	
Minor detail(s)	

Task 7. Match the words in *A* with the words in *B* to make phrases used in the text.

A		B
1) to do		a) science
2) to perform		b) a course in physics
3) project		c) writing
4) to master		d) problems
5) report		e) skills
6) fundamental		f) planning
7) to develop		g) a subject
8) to solve		h) experiments
9) transferable		i) a device or instrument

Task 8. Prepare 2-min speech to answer the question **WHY STUDY PHYSICS?** Use ideas from **Task 6** and phrases from **Task 7.**

Task 9. ***Discuss***

- Which reasons described in the text motivated you to choose the Physics faculty? Did you have any other reasons?
- What commonly used expressions in everyday language that come from physics do you know? What particular fields of physics do they come from?
- Are career opportunities for physicists good in Russia? What are they?

LISTENING 'Why do we study Physics?' https://www.youtube.com/watch?v=yIIPjKjtLUs)

Task 10. Before you listen, do the Test.

1. Tick (V) the fields Physics is the study.

__ energy __ force __ color __ light __ movement __ sense of smell

Tick (V) the best option

2. Physics is the study____.

a) of quantum mechanics b) simulation software c) of nature & how it works

3. the questions of the fundamental laws of universe …

a) why don't we fly top into the sky?

b) why animals cry?

c) why people have high temperature?

Task11. Watch the video ‘Why do we study Physics?’ and check your answers. (https://www.youtube.com/watch?v=yIIPjKjtLUs)
Name the science(s) physics relates to (from the video).
Is it true that our hands are different when we put them in to the water?

Task12. Listen again to complete the sentences below.
1. You will study energy, force, light and movement. You will at the way a material moves through the space and _____. And how things like _____ and _____ affect that movement.
2. You will learn fundamental laws of universe like: why don’t we flow top into the sky? Or why our hands look _____ when we put them in the water.
3. Nearly every civilization had some forms of physics. It is the way we understand the world in _____ way.
4. what relevance does it have with other sciences? Chemistry and biology rely on the law of physics to perform _____.
5. Cell phones and computers are created by following the laws of physics that study _____.
6. Cars were invented when scientists discovered how to convert fuel into _____ _____
7. In medical care, machines like X-rays or ultrasound were created by studying the principle of _____ and _____.

Task 13. Discuss
Name the course(s) in physics you are doing now at university. Are these courses theoretical or practical?
 Which course do you enjoy most? Why?
 Which new courses are you going to take next semester? What topics do they cover?
 Would you be interested in doing a professional internship (what subject area and what company)?

Task 14. Work in teams.
1. For each field of physics (1-10) brainstorm two or three terms that go with it.
Example: *condensed matter physics – solid, liquid, gas, etc.*
2. Match the field of physics with the area(s) of its application.
3. Make use of the models in the Study help box to share your ideas about these branches of physics and their applications.
NB! Each area of application can refer to more than one field of physics.

FIELDS OF PHYSICS	AREAS OF APPLICATION
	a) to create large capacity disks
	b) to develop medical imaging instrumentation
1) OPTICS	c) to make new materials
2) BIOPHYSICS	d) to set up satellite communication
3) RADIOPHYSICS	e) to build telescopes
4) NUCLEAR PHYSICS	f) to operate a nuclear reactor
5) NANOPHYSICS	g) to produce computer chips
6) CONDENSED MATTER PHYSICS	h) to design and create smart machines
7) ASTROPHYSICS	i) to modify microorganisms for biofuel and bioelectricity
8) PARTICLE PHYSICS	j) to develop atomic size machines
9) ACOUSTICS	k) to determine the age of an ancient object or a person
10) MECHANICS	l) to create better concert halls
	m) to develop lasers
	n) to understand the birth and evolution of the Universe
	o) to develop intercontinental broadband data channels
	p) to examine the level of safety of the car and its occupants

Part I: English Grammar

Instructions: Select the best answer.

1. Juan_____ in the library this morning.

A) is study
B) studying
C) is studying
D) are studying

2. Alicia, _____ the windows please. It's too hot in here.

A) opens
B) open
C) opened
D) will opened

3. The movie was _____ the book.

A) as
B) as good
C) good as
D) as good as

4. Eli's hobbies include jogging, swimming, and _____.

A) to climb mountains
B) climb mountains
C) to climb
D) climbing mountains

5. Mr. Hawkins requests that someone _____ the data immediately.

A) sent
B) sends
C) send
D) to send

6. Who is _____, Marina or Sachiko?

A) tallest
B) tall
C) taller
D) the tallest

7. The concert will begin _____ fifteen minutes.

A) in
B) on
C) with
D) about

8. I have only a _____ Christmas cards left to write.

A) few
B) fewer
C) less
D) little

9. Maria _____ never late for work.

A) am
B) are
C) were
D) is

10. The company will upgrade _____ computer information systems next month.

A) there

B) their
C) it's
D) its

11. Cheryl likes apples, _____ she does not like oranges.
A) so
B) for
C) but
D) or

12. You were _____ the New York office before 2 p.m.
A) suppose call
B) supposed to call
C) supposed calling
D) supposed call

13. Ms. Guth _____ rather not invest that money in the stock market.
A) has to
B) could
C) would
D) must

14. The rate of _____ has been fluctuating wildly this week.
A) money
B) bills
C) coins
D) exchange

15. The bus _____ arrives late during bad weather.
A) every week
B) later
C) yesterday
D) always

16. Do you _____ where the nearest grocery store is?
A) know
B) no
C) now
D) not

17. Many cultures have special ceremonies to celebrate a person's _____ of passage into adulthood.
A) right
B) rite
C) writ
D) write

18. The chairperson will _____ members to the subcommittee.
A) appoint
B) disappointment
C) appointment
D) disappointed

19. The critics had to admit that the ballet _____ was superb.

A) procrastinate
B) performance
C) pathology
D) psychosomatic

20. Peter says he can't _____ our invitation to dinner tonight.

A) angel
B) across
C) accept
D) almost

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1 c, 2 b, 3 d, 4 d, 5 b, 6c , 7 a, 8 a, 9 d, 10 d, 11 c,12 b, 13 c, 14 a, 15 d, 16 a, 17 a, 18 a, 19 b, 20 c

Keys to listening

1 time; energy and force, 2 different, 3 scientific, 4 calculations, 5 electricity, 6 kinetic energy, 7 light and electricity.