ER 1 LESSON

TOPIC: Mechanics - revision

SUBJECT: PHYSICS

LEVEL/AGE: 15-16

FOREKNOWLEDGE: PHYSICS- MAIN PHYSICAL QUANTITIES RELATED TO MOVEMENT

CHEMISTRY – REACTIONS, TYPES OF CHEMISTRY, MIXTURES & CHANGES, SUBATOMIC PARTICLES

CORRELATION:

TIME: 60 MINUTES

KEY WORDS

- Velocity, acceleration, distance
- Energy, time, pressure
- Force

LEARNING OUTCOMES

- Understand basic concepts of Physics
- Revise the basic Physical quantities- velocity, acceleration, distance, energy, pressure, force etc.
- Understand how to apply physical quantities in order to resolve physical problems – qualitative and quantitative.

RESOURCES

- Stationary
- Worksheets
- Students' book

TEACHING METHODS

- Hands-on learning
- Ex Cathedra

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ACTIVITIES

INTRODUCTION TO THE LESSON (5-10 MINUTES)

Show a set of pictures related to different Physics' concepts – movement, forces etc. And ask students to find out what is common between the pictures. After a brief discussion explain that you are going to revise the physical quantities related to movement.

THEORY / HANDS-ON/ EXERCISE PART OF THE LESSON (40 MINUTES)

In this part, the students learn by experimenting with the physical quantities.

Each student is given a worksheet with printed tasks. Tasks are designed to help students revise all studied physical quantities.

Worksheet

Task 1. Fill in the table with the names, label, unit and formulas for the quantities given:

Quantity	Quantity designation	Unit	Formula / law
mass			
	V		
distance			
	a		
			$F_a = r.g.h$
Potential energy			
			$E_k = mv^2 / 2$
		N	
density			
		Pa	

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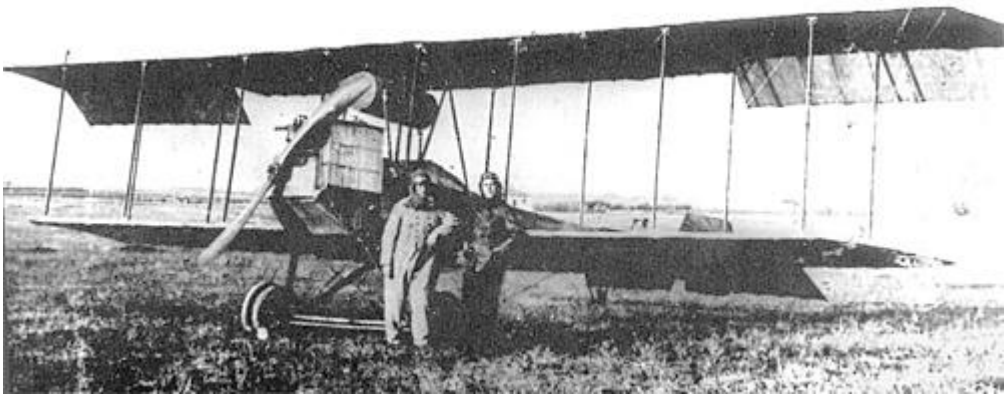
Read the text and resolve the tasks given below

A local Bulgarian newspaper, dated February 16, 1912, published an article entitled 'First Bulgarian glider', which read:



In the last few days, on the field between the infantry camp and the pioneer barracks, a very young Bulgarian aviator drills with his glider built by himself. He is a high school schoolboy, Assen Yordanov, the son of the Administrator of the Bank of Agriculture. He is fifteen, passionately keen on aviation and as a child fashioned toys that could fly. Last year, when visiting France and Italy, he saw the biplane of Maslennykov and Tchernyak, and from then on thought seriously to conquer the air himself. His glider is a very simple, light affair, based on the constructions of the Wright brothers and of Farman. It is 7 meters long, 1.20 m wide, with a surface area of 14 m2 and weights 23 kg. Yesterday he flew for over 12 minutes and reached an altitude of 10 to 12 meters. This young man's glider deserves praise, especially from aviation specialists.

In 1912, at the age of 16, Assen Jordanoff built his first workable glider. Later on, he studied abroad and became a famous engineer and inventor. He made many improvements for engines of Boing planes, also invented airbags, and so called Jordan phone.

Task 2. Potential energy of the plane of Jordanoff using the date for height and mass of the plane from the text.

Given: To be found: Resolution:

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Task 3. The acceleration of the plane if the driving force is F = 2000N

Given: To be found: Resolution:

Task 4. Distance flew by the plane for those 12 minutes if the speed of the plane was v =120km/h

Given: To be found: Resolution:

CONCLUSION (2-5 MINUTES)

You conclude on the lesson's findings and its usefulness.

- Repeat the activities you have carried out with them and try to address any remaining questions that students may have after having the lesson

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EVALUATION

List Questions for students after finishing the task:

- What were your expectations before starting the lesson?
- Do you feel more confident to use the Periodic Table of Elements now?
- What are the most important physical quantities /laws that describe movements?
- What was the most useful skill you have gained in this lesson?

INCLUSIVENESS GUIDELINES

- We will make sure that the worksheets are printed in a resolution and size that are clear enough for students to read.

LITERATURE - BIBLIOGRAPHY

M. Maksimov. Students book of Physics and astronomy for 9 grade, BULVEST press, 2000, Sofia, 2019
https://en.wikipedia.org/wiki/Assen_Jordanoff

Assen Jordanoff and Aviation by Milka Toteva, Societe des Gens de Lettres, Paris 1995 (in Bulgarian);

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