

Curriculum Map : Physics G10

Time	Content	Skills	Assessment
1st week of September (2h)	- Revision – what have we learnt last year	- recall some definitions, formulas and phenomena from units “Mechanical waves” and “Optics”	- warm-up questions (GCSE Physics) -presenting of simple experiments about mechanical waves and optics
2nd week of September (2h)	- Revision – what have we learnt last year	- recall some definitions, formulas and phenomena from unit “Static electricity and electric current”	- warm-up questions (GCSE Physics) - presenting of simple experiments about static electricity and electric current
3rd week of September (2h)	- Magnetic field - Magnetic poles - The Earth’s magnetic field - Interactions between two magnets - Magnets and electromagnets - Magnetic materials	- know what are magnetic poles - know that opposite magnetic poles attract and the same magnetic poles repel each other - draw the lines of magnetic field around magnet bar, know that they are directed from north to south pole - name materials that are magnetic - explain the meaning of terms: magnetically “soft” and “hard” - match magnetic poles on ends of a electromagnet - know factors the strength of an electromagnet depends on (current, number of turns, core) - give examples of applications of electromagnets - explain differences between paramagnetics, diamagnetics and ferromagnetics	- experiment: lines of magnetic field around a magnet bar - experiment: appealing and repulsion of two magnet bars - exercises (GCSE Physics) - homework: similar tasks to exercises done on the lesson
4th week of September (2h)	- Magnetic force on a moving charged particle - Applications of motion of charged particles in magnetic field - The Hall effect - Magnetic field on a current-carrying conductor - Magnetic force on a current loop	- know the formula for magnetic force acting on a charged particle; know the “right hand thumb rule”; know the direction of the particle motion in a magnetic field - know the unit of a physical quantity magnetic field - explain how is a mass sepctrometer built and how does it work - draw the lines of magnetic field around current-carrying wire, know the “right hand thumb rule” - know the formula for magnetic force acting on a straight wire segment; recall the “right hand thumb rule” - explain how does the loudspeaker look like and how does it work - explain the Hall effect - using the “right thumb rule” show the direction of magnetic force acting on a current-carrying loop	- quick test: lines of magnetic field - exercises (GCSE Physics) - homework: similar tasks to exercises done on the lesson

1st week of October (2h)	- Force between parallel conductors	- describe acting of force on two long, parallel, current-carrying conductors - explain when the interaction is repulsive or attracting - know the definition of ampere	- quick test: motion of charged particles in magnetic field - homework: exercises similar to tasks done on the lesson
2nd week of October (2h)	- Electromagnetic induction - Lenz's law - Induced electric field - Eddy currents and their applications	- know the Faraday's law - present the experiment to show the Faraday's law - know the Lenz's law - present the experiment to show the Faraday's law - explain how the electric field can be induced by the magnetic field - explain how are the metal detectors (used for example on airports) built and how do they work	- experiment: the Faraday's law - homework: information about Heike Kammerlingh Onnes and discovery of superconductivity
3 rd week of October (2h)	- Superconductivity	- know the history of discovery of superconductivity - describe a phenomenon of superconductivity and explain its importance	- quick test: electromagnetic induction - students' presentations about superconductivity and its discoverers
4 th week of October (2h)	- Revision of a unit MAGNETISM	- recall basic phenomena and principles of magnetism - describe materials that are magnetic - give examples of uses magnetic materials and magnetic phenomena	- warm-up questions (GCSE Physics)
2nd week of November (2h)	END OF A UNIT TEST MAGNETISM		
3 rd week of November and 4 th week of November (4h)	- Einstein's special theory of relativity	- know Einstein's first and second postulates - define inertial frames of reference - know the Galilean coordinate and velocity transformations - explain the relativity of: simultaneity, time intervals, length - explain the twin paradox - know the formula for the Lorentz transformations	- homework: information about radioactive elements and Marie Curie-Skłodowska discoveries
1st week of December (2h)	- Structure of the atom - Nuclear stability and radioactivity - Alpha, Beta and Gamma decays - Activities and half-lives	- recall informations about structure of atom and nucleus from chemistry - give examples of radioactive elements - know and give examples of alpha, beta and gamma decays - know the formula and calculate half-lives of different elements - explain the importance of M. Curie-Skłodowska discoveries	- warm-up questions: structure of atom - students' presentation about radioactive elements and Marie Curie-Skłodowska discoveries - homework: information about nuclear weapon and nuclear reactors

2nd week of December (2h)	<ul style="list-style-type: none"> - Nuclear reactions - Nuclear reactors and nuclear weapon 	<ul style="list-style-type: none"> - give example of nuclear reactions - present a history of atomic bomb from Los Alamos, Hiroshima and Nagasaki - describe the Chernobyl disaster - explain advantages and disadvantages of nuclear reactors 	<ul style="list-style-type: none"> - students' presentations - homework: writing a scientific essay based on a scientific article about nuclear reactors or nuclear weapon
3rd week of December (2h)	<ul style="list-style-type: none"> - Atomic lines spectra and energy levels 	<ul style="list-style-type: none"> - know the Bohr's model of atom - know the Balmer-Rydberg formula for hydrogen - calculate the frequency and wavelength of emitted light in Lyman and Balmer series for hydrogen 	<ul style="list-style-type: none"> - homework: information about world's biggest accelerators
2nd week of January (2h)	<ul style="list-style-type: none"> - Particle physics - Particle accelerators and detectors - Quarks 	<ul style="list-style-type: none"> - name basic particles - shortly describe quarks - describe how is the simplest accelerator built, how does it work, and why and where is it used - know where are the biggest accelerators in the world 	<ul style="list-style-type: none"> - quick test: calculation of the frequency and wavelength of emitted light in Lyman and Balmer series for hydrogen - students' presentations: CERN
3rd week of January (2h)	<ul style="list-style-type: none"> - Revision of Modern Physics 	<ul style="list-style-type: none"> - recall the structure of atom - recall some nuclear reactions - know the Balmer-Rydberg formula for hydrogen - describe physical particles 	<ul style="list-style-type: none"> - warm-up questions (GCSE Physics)
4th week of January (2h)	END OF A UNIT TEST Modern Physics		
3rd week of February (2h)	<ul style="list-style-type: none"> - Solar System - Galaxies - Universe 	<ul style="list-style-type: none"> - name planets in the Solar System and briefly describe each of them - know the place of the Solar System in our Galaxy - Milky Way 	<ul style="list-style-type: none"> - warm-up questions (GCSE Physics) - homework: poster "Solar System"
4th week of February (2h)	<ul style="list-style-type: none"> - Life cycle of stars 	<ul style="list-style-type: none"> - analyse the Hertzsprung-Russell diagram - describe paths in life cycle of stars - explain the meaning of: giant star, dwarf star and black hole - make prediction: what will happen to the Sun 	<ul style="list-style-type: none"> - quick test: Solar System - warm-up questions (GCSE Physics) - homework: poster "Life Cycle of Stars"
1st week of March (2h)	<ul style="list-style-type: none"> - The Big Bang theory - Hubble's law 	<ul style="list-style-type: none"> - explain the concept of the Big Bang theory - explain how do we know that the Universe is spreading out - know Hubble's law - prediction of the Universe age based on Hubble's law 	<ul style="list-style-type: none"> - quick test: life cycle of stars - homework: biography of Hubble and his discovery
2nd week of March (2h)	<ul style="list-style-type: none"> - Excursion to the astronomical observatory 	<ul style="list-style-type: none"> - know how do the astrophysicists and astronomers work - describe how are the telescopes built and how do they work 	
3rd week of March (2h)	<ul style="list-style-type: none"> - Revision of Astronomy 	<ul style="list-style-type: none"> - history of space travels - astronomical observatories in the world - how has the concept of the Universe been changing through 	<ul style="list-style-type: none"> - students' presentations

		centuries	
4th week of March (2h)	END OF UNIT TEST Astronomy		
2nd week of April (2h)	- Nuclear Physics and Cosmology	- give examples of main interests in Nuclear Physics and Cosmology - explain the importance of such researches	
3rd week of April (2h)	- Biophysics and Medical Physics	- give examples of main interests of biophysicists (photosynthesis, telomers, etc.) - give examples of applications of physical discoveries in Biology and Medicine - explain the importance of development of Biophysics and Medical Physics	
4th week of April (2h)	- Nanotechnology	- explain what are fullerenes and nanotubes - give example of their uses - explain the importance of development of Nanotechnology	
2nd week of May (2h)	- Revision of New trends in physics	- recall some branches of physics that are developed - explain the reason of interest in these particular branches - describe new trends in physics	
3rd week of May	END OF UNIT TEST New trends in Physics		
4th week of May (2h)	- Whole year physics revision in games	- recall some definitions - explain some physical phenomena - select the most important informations (definitions, formulas) from others	
2nd week of June (2h)	- Whole year physics revision in films	- name physical phenomena in films - give examples of situations in which science ends and fiction begins	
3rd week of June (2h)	- Whole year physics revision in films	- name physical phenomena in films - give examples of situations in which science ends and fiction begins	