

## Curriculum Map : Physics G9

<b>Time</b>	<b>Content</b>	<b>Skills</b>	<b>Assessment</b>
1st week of September (2h)	- Revision – what have we learnt last year	- recall some definitions, formulas and phenomena from units “Kinetics” and “Dynamics” - recall some definitions, formulas and phenomena about unit “Work, Power and Energy”	- warm-up questions (GCSE Physics) -presenting of different types of motion in simple physical experiments
2nd week of September (2h)	- Revision – what have we learnt last year	- recall some definitions, formulas and phenomena from unit “Thermodynamics”	- warm-up questions (GCSE Physics) - presenting of Pascal’s and Archimedes’ principles, convection and other physical phenomena in simple physical experiments
3rd week of September (2h)	- Types of mechanical waves	- know the definition of mechanical wave - explain the difference between longitudinal and transverse wave, and give examples of these types of waves - know what is transported by waves - define: wavelength, amplitude, period, frequency and speed of wave - match these quantities on graphs - know formula for wave speed - see connection between harmonic motion and waves	-warm-up questions about waves - experiments: presentation of longitudinal and transverse waves - experiments: examples of mechanical waves (water waves, sound)
4th week of September (2h)	- Wave phenomena	- name and describe wave phenomena: reflection, refraction and diffraction - name and describe interference - transform formula for wave speed to obtain wavelength, frequency or period	- quick test: definition of mechanical wave, types of waves, physical quantities describing waves - homework: calculating tasks similar to exercises done on the lesson
1st week of October (2h)	- Sound waves - Human ear	- define sound wave - explain why sound waves don’t travel through vacuum - explain why sound waves travel faster in denser media - know the audible range - name and describe subjective terms of sound - name objective terms of sound - know the decibel scale, know the value of threshold of pain and threshold of hearing - recall the knowledge from biology and explain why do people hear	- quick test: physical quantities describing waves - warm-up questions about sounds - experiments: travelling of sound waves in different media -homework: biography of Graham Bell and his invention; Human ear – how do we hear
2nd week	- Doppler effect	- explain the Doppler effect	- quick test: sound waves – calculations

of October (2h)		- give examples of situations where the Doppler effect takes place	- homework: biography of Doppler, shock waves, applications of ultrasounds
3 <sup>rd</sup> week of October (2h)	- Shock waves and Concorde planes - Applications of ultrasounds	- describe appearing of shock waves - give examples of applications of ultrasounds	- students' presentations
4 <sup>th</sup> week of October (2h)	- Revision of Mechanical waves	- give definitions of mechanical waves, sound waves, physical quantities describing waves - name and describe such phenomena as reflection, refraction, diffraction and interference - recall subjective and objective terms describing sounds	- homework: calculating tasks similar to exercises done on the lesson
2nd week of November (2h)	END OF A UNIT TEST Mechanical waves		
3rd week of November (2h)	- Reflection, refraction and total internal refraction	- describe diffuse and clear reflection of light on rough and smooth surface, respectively - know the law of reflection - know the law of refraction - describe the phenomenon of total internal reflection - give examples of use of total internal reflection	- warm-up questions: wave phenomena
4th week of November (2h)	- Mirrors	- describe and draw image formation by a plane mirror - describe and draw image formation by a spherical mirror (concave and convex) - know and explain meaning of lateral magnification	- exercises with mirrors - homework: solving tasks similar to exercises done on the lesson
1st week of December (2h)	- Lenses	- describe and draw image formation by a thin lens, mark three principal rays - know the lensmaker's equation for a thin lens - know and explain the meaning of such terms as: focal point, virtual focal point, focal length, lateral magnification	- exercises with lenses - homework: solving tasks similar to exercises done on the lesson
2nd week of December (2h)	- Optical devices: glasses, microscopes, telescopes, cameras, projectors - Human eye	- describe how are cameras and projectors built and explain how do they work - describe how is an microscope built and explain how does it work - describe how is an telescope built and explain how does it work - describe how is an eye built and explain how does it work - describe myopia, hyperopia and astigmatism	- quick test: image formation in mirrors and lenses - students' presentations about optical devices
3rd week	- Diffraction	- describe such phenomena as: diffraction, interference and	- warm-up questions about wave

of December (2h)	<ul style="list-style-type: none"> <li>- Interference</li> <li>- Dispersion, prism</li> </ul>	<p>dispersion of light</p> <ul style="list-style-type: none"> <li>- explain the reason of presence of a rainbow when light passes through a prism</li> </ul>	<p>phenomena</p> <ul style="list-style-type: none"> <li>- Newton's experiment with prism – dispersion of light</li> <li>- homework: Albert Einstein's biography</li> </ul>
2nd week of January (2h)	<ul style="list-style-type: none"> <li>- Photoelectric effect</li> </ul>	<ul style="list-style-type: none"> <li>- explain the dual nature of light</li> <li>- know the term of photon</li> <li>- describe the phenomenon of photoelectric effect</li> </ul>	<ul style="list-style-type: none"> <li>- students' presentations about Einstein</li> <li>- homework: UV, X-rays and other types of radiation - applications</li> </ul>
3rd week of January (2h)	<ul style="list-style-type: none"> <li>- Electromagnetic wave spectrum</li> <li>- Application of EM waves</li> </ul>	<ul style="list-style-type: none"> <li>- name types of electromagnetic waves (radiowaves, microwaves, infrared, visible, UV, X-rays, gamma)</li> <li>- give examples of applications of each</li> <li>- describe their effects on living tissues</li> </ul>	<ul style="list-style-type: none"> <li>- students' presentations about applications of different types of EM waves</li> </ul>
4th week of January (2h)	<ul style="list-style-type: none"> <li>- Revision of Optics</li> </ul>	<ul style="list-style-type: none"> <li>- recall laws of reflection, refraction and total internal reflection</li> <li>- describe and draw image formation by mirrors and lenses</li> <li>- describe how optical devices are built and how do they work</li> <li>- describe such phenomena as: diffraction, interference and dispersion of light</li> <li>- recall types of EM waves and their applications</li> </ul>	<ul style="list-style-type: none"> <li>- warm-up questions and calculations</li> <li>- homework: calculating tasks similar to exercises done on the lesson</li> </ul>
3rd week of February (2h)	<p>END OF A UNIT TEST Optics</p>		
4th week of February (2h)	<ul style="list-style-type: none"> <li>- Electric charge</li> <li>- How can we charge bodies</li> <li>- Repulsive and appealing interactions between charged bodies</li> <li>- Principle of conservation of electric charge</li> </ul>	<ul style="list-style-type: none"> <li>- know that there are two types of electric charge: positive and negative</li> <li>- know the charge of an electron and that every charge is a multiplicity of electron's charge</li> <li>- know the unit of charge</li> <li>- know that opposite electric charges attract and the same electric charges repel each other</li> <li>- name three ways of charging bodies: friction, touch and induction</li> <li>- explain which physical quantities have influence on interactions between charged bodies</li> <li>- know the formula for Coulomb's force</li> <li>- know the principle of conservation of electric charge</li> </ul>	<ul style="list-style-type: none"> <li>- warm-up questions: what do we know about charges</li> <li>- experiments: ways of charging bodies, interactions between charged bodies</li> <li>- Coulomb force - calculations</li> <li>- homework: calculating tasks similar to exercises done on the lesson; biography of Heike Kamrelingh Onnes and his invention</li> </ul>
1st week of March (2h)	<ul style="list-style-type: none"> <li>- Electric field</li> <li>- Intensity of electric field</li> <li>- Insulators, conductors and</li> </ul>	<ul style="list-style-type: none"> <li>- draw the lines of electric field, know that they are directed from positive to negative charge</li> <li>- match on graphs intensity of electric field</li> <li>- explain how does intensity of electric field depend on the value of source of electric field and distance from that source</li> </ul>	<ul style="list-style-type: none"> <li>- quick test: interactions between charged bodies</li> <li>- warm-up questions: what do we know about insulators and conductorsmeter</li> <li>- students' presentations:</li> </ul>

	superconductors	<ul style="list-style-type: none"> <li>- give examples of materials that are insulators and conductors</li> <li>- explain the difference between insulators and conductors</li> <li>- describe the phenomenon of superconductivity</li> </ul>	<ul style="list-style-type: none"> <li>superconductivity and Onnes</li> <li>- homework: read your electricity meter</li> </ul>
2nd week of March (2h)	<ul style="list-style-type: none"> <li>- electric current</li> <li>- voltage</li> <li>- resistance</li> <li>- Ohm's law</li> <li>- electric energy</li> <li>- electric power</li> </ul>	<ul style="list-style-type: none"> <li>- compare flow of electric current with flow of water in a river</li> <li>- know that direction of current flow is opposite to direction of electrons' motion</li> <li>- know the definition (with formula) of electric current</li> <li>- know the unit of electric current</li> <li>- explain the term of voltage</li> <li>- know the unit of voltage</li> <li>- know the definition (with formula) of resistance</li> <li>- explain what does the resistance depend on</li> <li>- know the Ohm's law</li> <li>- read electricity meter and work out the bill</li> <li>- explain the unit of kilowatt-hours</li> <li>- suggest ways of saving electrical energy at home</li> <li>- know the definition (with formulas) of electric power</li> </ul>	<ul style="list-style-type: none"> <li>- current, voltage and resistance - calculations</li> <li>- homework: writing Lab Report - Ohm's law</li> </ul>
3rd week of March (2h)	<ul style="list-style-type: none"> <li>- electric circuits</li> <li>- Kirchhoff's laws</li> <li>- Ohm's and Kirchhoff's laws - calculations</li> </ul>	<ul style="list-style-type: none"> <li>- explain why ammeters are connected in series and voltmeters in parallel</li> <li>- know the first and the second Kirchhoff's laws</li> <li>- calculate electric current, voltage or resistance transforming formula for Ohm's law</li> </ul>	<ul style="list-style-type: none"> <li>- quick test: resistance and Ohm's law</li> <li>- warm-up questions (GCSE Physics)</li> </ul>
4th week of March (2h)	<ul style="list-style-type: none"> <li>- connecting in series and in parallel elements (resistance) in electric circuits</li> </ul>	<ul style="list-style-type: none"> <li>- calculate the effective resistance of simple systems of resistors</li> </ul>	<ul style="list-style-type: none"> <li>- warm-up questions (GCSE Physics)</li> <li>- homework: calculating tasks similar to exercises done on the lesson</li> </ul>
2nd week of April (2h)	<ul style="list-style-type: none"> <li>- connecting in series and in parallel elements (condensers) in electric circuits - calculations</li> </ul>	<ul style="list-style-type: none"> <li>- know the definition (with formula) of capacity of condenser</li> <li>- know the unit of capacity of condenser</li> <li>- calculate the effective condenser of simple systems of condensers</li> </ul>	<ul style="list-style-type: none"> <li>- warm-up questions (GCSE Physics)</li> <li>- homework: calculating tasks similar to exercises done on the lesson</li> </ul>
3rd week of April (2h)	<ul style="list-style-type: none"> <li>- Test: connecting elements in electric circuits</li> </ul>		<ul style="list-style-type: none"> <li>- homework: demands for electric energy in a modern society</li> </ul>
4th week of April (2h)	<ul style="list-style-type: none"> <li>- Transformers</li> <li>- Electrical devices (inkjet printer,</li> </ul>	<ul style="list-style-type: none"> <li>- know the transformer equation</li> <li>- explain where and why are transformers used</li> <li>- calculate simple tasks using transformers equation</li> </ul>	<ul style="list-style-type: none"> <li>- students' presentations: demands for electric energy in a modern society</li> <li>- transformers - calculations</li> </ul>

	photocopier) - Power stations	- describe how inkjet printer is built and how does it work - describe how photocopier is built and how does it work - describe how power station is built and how does it work	- homework: calculating tasks similar to exercises done on the lesson
2nd week of May (2h)	- Revision Electricity	- recall definitions (and formulas) for: Coulomb's force, intensity of electric field, electric current, voltage, resistance, capacity of condenser - recall Ohm's and Kirchhoffs' laws - explain the difference between insulators and conductors	- homework: calculating tasks similar to exercises done on the lesson
3rd week of May (2h)	END OF A UNIT TEST Electricity		- homework: informations about thunderbolts
4th week of May (2h)	- The phenomenon of thunderbolts	- explain the phenomenon of lightning	- students' presentations: thunderbolts
2nd week of June (2h)	- Whole year physics revision in games	- recall some definitions - explain some physical phenomena - select the most important informations (definitions, formulas) from others	
3rd week of June (2h)	- Whole year physics revision in films	- name physical phenomena in films	