



وزارة التربية والتعليم
قطاع التعليم العام

مكتب مدير عام تنمية العلوم وحدة دعم مدارس المتفوقين في العلوم والتكنولوجيا STEM

نشرة خاصة بطلاب مدارس المتفوقين في العلوم والتكنولوجيا

الصف الثالث الثانوي - نواتج التعلم حتى 2020/3/15

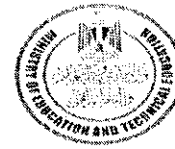
نظرًا للظروف الخاصة التي تمر بها البلاد ، وفي ضوء توجيهات معالي الأستاذ الدكتور/ وزير التربية والتعليم فيما يخص نظام التقييم في العام الدراسي ٢٠١٩ / ٢٠٢٠ فقط ، بشأن ، يبين الجدول التالي نواتج التعلم المقرر تقييمها في اختبار المفاهيم (ToC) للمواد العلمية (الفيزياء – الكيمياء – الأحياء – علوم الأرض والفضاء) للصف الثالث الثانوي بالإضافة لمخرجات التعلم التراكمية (Inventory Los) من الصفين الأول والثاني.

Subject	LOs for G12	Inventory LOs for G10&G11
Physics	Till the end of PH.3.11	Ph.1.03, Ph.1.06, Ph.1.11, Ph.2.06, Ph.2.07, Ph.2.08, Ph.2.11, Ph.2.12, Ph.2.13, Ph.2.16.
Chemistry	Till the end of CH.3.13	CH 1.04, CH 1.05, CH 1.10, CH 1.11, CH 1.12, CH 1.13, CH 1.15, CH 2.03, CH 2.04, CH 2.05, CH 2.06, CH 2.07.
Biology	Till the end of Bi. 3.11	BI.1.02, BI.1.04, BI.1.05, BI.1.06, BI.1.07, BI.1.08, BI.1.09, BI.1. 10, BI.2.03, BI.2.05, BI.2.06, BI.2.07
Earth Science	Till the end of ES.3.10	ES.1.02 ,ES.1.04, ES.1.05, ES.1.06, ES.1.07, ES.1.11, ES.1.12, ES.2.01, ES.2.07, ES.2.08, ES.2.12, ES.2.13.

مدير عام تنمية مادة العلوم

يسري فؤاد سويرس

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First: Physics

LOs till the end of PH. 3.11 + Inventory Los from G10&G11

No.	LO	Learning Outcomes
1	Ph. 1.03	Predict an object's motion based on the forces that are acting on it.
2	Ph. 1.06	Understand that certain material objects (e.g. springs that follow Hooke's Law) generate restoring forces that act to maintain them in an equilibrium shape.
3	Ph. 1.11	Analyze energy flow in typical heating and cooling applications by applying the 1st Law of Thermodynamics.
4	Ph.2.06	Predict the direction of magnetic field produced by current-carrying wires in different configurations.
5	Ph.2.07	Determine the magnetic force on a charged particle moving in a magnetic field and the effects of the force on the particle's motion.
6	Ph.2.08	Use Faraday's law of induction to determine induced voltage in conducting loop due to changes in magnetic flux.
7	Ph.2.11	Analyze the behavior of transformers using mutual Induction
8	Ph.2.12	Analyze simple AC circuits containing resistive elements.
9	Ph.2.13	Analyze the filtering characteristics of circuits containing capacitors and/or inductors
10	Ph.2.16	Analyze basic circuits containing a bipolar transistor used as a digital switch or amplifier.



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Second : Chemistry

LOs till the end of CH. 3.13 + Inventory Los from G10&G11

No.	LO	Learning Outcomes
1	CH1.04	Through laboratory investigations develop operational definitions of chemical elements, differentiate between metals/nonmetals and chemical and physical properties of unknown elements based on their position and atomic structures in the periodic table.
2	CH1.05	Describe how to determine chemical behavior according to valence electrons and how and why atoms interact with each other.
3	CH1. 10	Calculate quantities of products formed from known quantities of reactants and be able to discuss their precision and accuracy
4	CH1. 11	Investigate four types of chemical reactions, generate and test for hydrogen, oxygen and carbon dioxide and determine the most effective ratio of hydrogen to oxygen for propulsion of a small rocket.
5	CH1.12	Use two- and three-dimensional models and their understanding of bond polarity to illustrate polar and non-polar inter-molecular forces.
6	CH1.13	Use understanding of the metal activity series to explain why metals are found as they are in nature and discuss considerations (such as exposure to different kinds of solutions) for the use of metals in industry, construction and jewelry.
7	CH1.15	Determine, explain and illustrate how energy and disorder change during physical and chemical processes
8	CH2.03	Describe characteristic properties of acids and bases and preparation of salts
9	CH2.04	Describe the effect of concentration, pressure, surface area, temperature and catalysis (including enzymes) on the rates of reactions and explain these effects in terms of collisions between reacting particles.
10	CH2.05	Explain how catalysts (transition metals, nano-particles, and biological enzymes) lower activation energy and increase reaction rates, and suggest a suitable method for investigating the effect of a given variable on reaction rate.
11	CH2.06	Explain the meaning of reversible reaction, dynamic equilibrium, and state Le Châtelier's Principle. Apply these concepts to predict the change that will occur when a stress is applied to system at equilibrium.
12	CH2.07	Explain qualitatively the extent of dissociation of strong and weak acids and bases. Use the common ion effect to explain buffers in terms of pH, K_a , pK_a , K_w and K_{sp} . Calculate related quantities.



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Third: Biology

LOs till the end of Bi. 3.11 + Inventory Los from G10&G11

No.	LO	Learning Outcomes
1	BI.1.02	Compare and contrast the structures within the cells of plants, animals, Protista and bacteria which function to enable the cell to live.
2	BI.1.04	Create a model which shows the structure of DNA and RNA as a genetic material only: 1) The difference between DNA and RNA structure. 2) Complementary base pairing rules .
3	BI.1.05	Investigate the functions of different classes of proteins and the factors affecting their performance: 1) know the structure, classes and functions of proteins; 2) know the mechanism of an enzyme function as a catalyst and the factors that effect on it.
4	BI.1.06	Create a model which outlines the cell cycle in controlled and uncontrolled cell divisions, including uncontrolled cell division resulting in cancer.
5	BI.1.07	Evaluate stem cells as possible cures for some diseases: 1) cell differentiation; and 2) stem cells as a cure for disease.
6	BI.1.08	Create a simulation to show how viruses infect a cell: 1) know organelles of healthy cells; 2) explain why a virus can't replicate by itself and must use the cell's organelles; and 3) identify which organelles are used by the virus
7	BI.1.09	Providing supplies as the microscopic slides. Focusing on the study of leaf structure in a dicot plant. Relate the structure of specialized plant structures to their function within the plant and within the process of photosynthesis. 1) examine and draw cross section of dicot leaf; 2) include structures of mesophyll cells, stomata, xylem, phloem, and chloroplast; and 3) include other plant structures listed under concepts section.
8	BI.1.10	Compare and contrast the processes of photosynthesis and cellular respiration: 1) describe the process of photosynthesis including the interactions between the light dependent and light independent stages of photosynthesis; 2) describe the process of cellular respiration, both aerobic and anaerobic; and 3) identify the factors that influence photosynthesis and cellular respiration.
9	BI.2.03	Discuss how the chemical and structural properties of DNA and its replication result in the creation of new genotypes: 1) design a model to show the structure of DNA; and 2) determine how DNA replicates 3) Gene expression and protein synthesis
10	BI.2.05	Compare and contrast selective breeding and genetic modification to breed a new type of wheat in Egypt with a minimum of two desired traits.
11	BI.2.06	Interpret how sex-linked chromosomes and abnormalities of chromosomes affect the inheritance of traits and solve problems about sex-linked traits.
12	BI.2.07	Explain how genomics has the potential to contribute in solving sustainability problems to infer the genetic mechanism of inheritance for a given trait.



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Fourth: Earth Science

LOs till the end of ES. 3.10 + Inventory Los from G10&G11

No.	LOs	Learning Outcomes
1	ES.1.02	Examine common minerals and identify them and differentiate them from other common minerals.
2	ES.1.04	Examine and interpret the textural and compositional characteristics of igneous rocks and interpret igneous rock textures and mineral composition.
3	ES.1.05	Examine and interpret the textural and compositional characteristics of sedimentary rocks and interpret sedimentary rock textures, mineral composition and depositional environments.
4	ES.1.06	Examine and interpret the textural and compositional characteristics of metamorphic rocks and interpret textures and factors that affect metamorphic processes.
5	ES.1.07	Interpret the relationships among sedimentary, igneous, and metamorphic rocks in terms of Earth processes and the rock cycle and use their understanding of the rock cycle to explain the Egyptian cross section.
6	ES.1.11	Recognize the processes by which fossil fuels (coal) are extracted and processed for human use.
7	ES.1.12	Recognize the processes by which fossil fuels (petroleum and natural gas) are extracted and processed for human use.
8	ES.2.01	Analyze how the unusual properties of water contribute to its pathways through earth's systems.
9	ES.2.07	Explore factors which affect the movement and deposition of loose sediments by wind.
10	ES.2.08	Identify and explain the basic physical properties of soils by recognizing the major components of it.
11	ES.2.12	Apply different methods and principles of relative and absolute age dating of different rock units and geologic formations to explain geologic history.
12	ES.2.13	Analyze the development and structure of the Geological Time Scale.

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