COLEGIO SAN AGUSTÍN 2017 AREA: Natural Sciences	TEACHER: Cristina de Nájera Valera YEAR: 3rd A y B

BIOLOGY YEARLY PLAN

GENERAL AIMS:

- To interpret and analyse daily life phenomenon and facts through the sciences that make up the area, enhancing its real value.
- To foster debate and collaboration among peers.
- To learn concepts through lab practice and investigation.
- To search for different technological tools available.
- To acquire a sound scientific culture, resulting in more responsible citizens.

SKILLS TO BE DEVELOPED:

- Communication (C)
- Critical thought, initiative and creativity (CT, I&C)
- Analysis and comprehension of information (A&CI)
- Problem solving (PS)
- Social interaction, collaborative task (SI&CT)
- Responsible citizens (RC)
- Rating art work (RAW)
- Self care, personal development, independent learning (SC, PD & IL)

UNIT	AIMS	CONTENTS	SKILLS AND ACTIVITIES
UNIT 1.1. Genetics	Identify in a karyotype the sex of the individual, the homologous, the autosomic and the sexual chromosomes.	1.1.1 Chromosomes and karyotype. 1.1.2.DNA and RNA	1.1.1. CT, I&C, A&CI Video use to learn about nucleic acid' structure. 1.1.2. y 1.1.3. CT, I&C RAW PS

	Learn about the inheritance main biomolecule, its structure and composition. Connect (differences and similarities) of the DNA and RNA's structure and function. Name and describe the different ways of organization of DNA. Link the concept of gene with the poly-peptide or protein. Name, identify and relate the transmission of genetic information from DNA to proteins.	1.1.3. DNA replication 1.1.4. Transcription 1.1.5. Translation	The use of cell model to trigger dialogue questions and answers to identify key concepts. 1.1.2. CT, I&C RAW PS Activity using cloth pins and ropes to determine the structure of DNA and RNA 1.1.4. CT, I&C RAW PS Activity using cloth pins and ropes to determine the passway of genetic information from DNA to RNA to proteins. 1.1.4. 1.1.5. y 1.1.6. A&CI Viewing of animations of the processes of DNA replication, transcription and translation.
UNIT 1.2. DNA mutations	Link the DNA replication mechanisms to the concept of mutation. Link the mutagens' effect to cancer and malformation. Consider cancer as a cluster of conditions caused by multiple factors, with variable evolution and prognosis.	1.2.1. Mutation 1.2.2. Mutagenes 1.2.3. Genetic and chromosome mutations 1.2.4. Cancer	1.2.1 .CT, I&C y A&CI Viewing of 3D animations about mutations 1.2.2. A&CI y SI&CT Use of karyotypes to observe trisomies. 1.2.4. C, CT, I&C, A&CI, SI&CT RC SC, PD & IL Group poster production on the symptoms and prevention of cancer.
UNIT 2.1. Homeostasis	Learn about homeostasis and the relation function and differentiate them from nutrition and reproduction function.	3.1.1.Relation function. 3.1.2.Relation function systems 3.1.3.Homeostasis	3.1.1. C, CT, I&C, A&CI, SC, PD & IL Diagram construction on the relation function systems.

	Name and characterize the function of the body systems which participate in homeostasis. Define and give examples of homeostasis.	3.1.4. Homeostasis mechanisms: feedback,the plasma membrane, etc..	
UNIT 2.2. Endocrine system	Understand hormones as chemical signals triggered by particular stimuli. Name and describe the function, synthesis and action mechanisms of main hormones. Locate in the body the main endocrine glands. Learn about the role of hormones in the sexual differentiation and growth of individuals. Link the different types of hormonal contraceptives and their effect on the female hormonal cycle.	2.2.1. Hormones and their mechanism. 3.2.2. Main hormone synthesis glands and target cells/tissues. 3.2.3.Growth and sexual development hormones. 3.2.4. Female sexual cycle and the hormonal contraceptives' mechanisms of action.	2.2.1. Description of differents hormonal pathways through different examples. 3.2.3. CT, I&C, A&CI, SI&CT RC SC, PD & IL Sexuality project: Hormonal effect in the development of secondary sexual characters. 3.2.4. C, CT, I&C, A&CI, SI&CT RC SC, PD & IL Sexuality project: Poster creation about the female hormonal cycle and the hormonal contraceptives' effects.
Unit 2.3. The nervous system	Learn that what reaches the nervous system is done through the senses. Name, locate and understand the functions of the main types of receptors. Differentiate the Central Nervous System from the Peripheral one, their characteristics and differences.	2.3.1.The integration of stimuli: the senses. 2.3.2. Information, receptors and transmitters. 2.3.4. Central Nervous System: parts and functions.	2.3.1. C, CT, I&C, A&CI, SI&CT SC, PD & IL Blindfolded experience (touch, taste, smell, and hearing) to describe what happens in the Central Nervous System. 2.3.3. CT, I&C, A&CI, Video viewing that shows the neuron' structure and synapse.

	Name, relate and describe the neuron's parts, its location and mechanism of action. Name the Central and Peripheral Nervous Systems parts and describe their functions. Name and give examples of stimuli - response in the Nervous System.	2.3.5. The Peripheral Nervous System: parts and functions. The PNS sympathetic and parasympathetic. 2.3.6. Action Potential 2.3.7. Neuron synapse 2.3.8. Examples of the Nervous System at work.	2.3.8. C, CT, I&C, A&CI, SI&CT RAW SC, PD & IL Infographics production to explain the reaction of the NS when facing certain stimuli.
Unit 2.4. Inmune system	Define the different types of lines of defence according to their location and characteristics. Examples. Name, locate and describe the main functions of the Inmune System cells. Describe the structure and the type of molecule of the antibody (its recognition by the antigen) Establish the main differences between innate and acquired immunity. Name and describe the most frequent autoimmune diseases. Name the HIV target cell, mechanisms of action and main characteristics. Differentiate between HIV carrier and AIDS sufferer. Describe the vaccination mechanism of action and link it to the acquired immunity.	3.4.1. Types of defences: external and internal, specific and unspecific 3.4.2.Cellular immunity and its cells. 3.4.3. Humoral immunity and antigen- antibody complex. 3.4.4. Innate and acquired immunity. 3.4.5. Immune system conditions: autoimmune and HIV/AIDS 3.4.6. Vaccines	4.4.1., 4.4.2. , 4.4.3. , 4.4.4. CT, I&C, A&CI, PS SC, PD & IL Videogame using to learn about the immune system cells (xentinelas xelulares) 3.4.5. C, CT, I&C, A&CI, PS SI&CT RC RAW SC, PD & IL Sexuality project: HIV/AIDS awareness campaign. 3.4.6. C, CT, I&C, A&CI, SI&CT RC SC, PD & IL Poster design including official vaccination calendar, historical process, mechanism of action, dosis, etc...

	Learn about the Argentine vaccination system and compare with other countries.		
UNIT 3.1. The ecosystem	Name and describe the biotic and abiotic factors that make up the ecosystem. Name and describe the different factors used to measure and predict the population development in a given ecosystem. Recognise in given examples, the inter and intraspecific relationships taking place in the ecosystem. Identify external factors which might modify the ecosystem. Propose models of intervention and sustainability of urban ecology.	2.1.1. Ecosystem components. 2.1.2.Population dynamics. 2.1.3. Inter and itraspecific relationships.. 2.1.4. Flow of energy and matter. 2.1.5. Food nets and chains. 2.1.6. Factors affecting biodiversity: climate, human activities, natural disasters. 2.1.7. Urban ecology.	2.1.1. CT, I&C, A&CI, Video viewing on population dynamics. 2.1.1. CT, I&C, A&CI, PS SC, PD & IL Use of a population dynamics simulator. 2.1.7. C, CT, I&C, A&CI, PS SI&CT RC SC, PD & IL Urban ecology project.

Methodological strategies:

- Following the instruction given by the teacher, students will carry out different activities (in groups of individually) which will be share in class, so they will be able to assess their own productions.
- Complex topics will be explained by the teacher.
- Some theoretical topics will be explained throw lab practice.
- The student is required to attend lessons with the material (books, folders in which classwork will be attached).Newspaper articles and lab tasks will be asked for accordingly

IT projects:

Videogames to learn the physiology of the relation and control systems.

Simulators to learn about population dynamics.

Video and poster production on the acquired knowledge.

Sexuality project:

Sexuality: Hormonal contraceptives mechanism of action.

Sexuality: Puberty physical and hormonal changes.

Sexuality: HIV/AIDS - an immune system STD.

Evaluation and class promotion

Folders: will be checked at any time during the term. Therefore they must be complete and in good condition. The teacher will grade them and this mark will be included in the 20%.

Lab practice: commitment and behaviour will be graded during lab experiences.
Each group will be assigned a lab- board. This and all the elements used during the task will be the responsibility of each group. A lab report will be evaluated by the teacher.

Tasks fulfilment: If the students fail to accomplish daily tasks, the teacher might ask them to give an oral lesson with a corresponding mark.

Materials: Students must have all the required materials, if not they won´t be able to do their tasks and come quaintly fail. Powerpoints, lab protocols and other documents must be printed and brought to class if required.

Edmodo: the teacher will send different tasks, tests and apps through Edmodo.com.

Oral tests: will be done as learning follow up between written tests. These might also be written with or without previous modification.

Written test: at least, written tests per term, announced with two weeks in advance. The passing mark is six or 75% of the contents. Those students who are absent to the test and don´t bring the corresponding certificate will fail. Those with a certificate will be evaluated during the following week using a different exam.
Written tests must be legible. Those students caught cheating, will have a one (1) and will be asked to hand in a written task on the subject the next week.

Attitudinal mark: Class participation, oral tests, folders and general behaviour in class will be considered to build up the attitudinal mark. Students will begin with a 10 and will have to maintain it throughout the year.

Chronograme:

Diagnosis: March
UNIT 1: March-Abril
UNIT 2: May - June - July - August - September - October
UNIT 3: November

Compulsory bibliography:

Jones, M (2009) *Biology.* Heinemann IGSE, Pearson