



GEP 1	Task 2: Reading, writing and Assessment in CLIL
Title of the lesson or topic	GENETIC INHERITANCE
Author	Elena Palmero
Course / year / age	4rd of ESO
Number of sessions	Two
Collaboration with...	
Main objectives of the sessions	1- Understand genètic concepts: CHROMOSOMES - GEN- PHENOTYPE- GENOTYPE- DNA- ALLELES- HOMOZYGOT- HETEROZYGOT 2- Understand Mendel experiments and the three laws. Describe genealogical trees. 3- Name differences between DNA and RNA. 4-Learn The Central Dogma of Molecular Biology: DNA makes RNA makes proteins. Describe transcription and translation.
Short description	These are two sessions of Genetics. In the first one, we are going to see how characters pass through generations

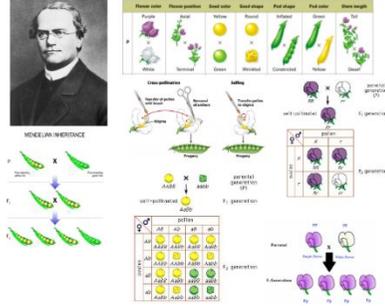
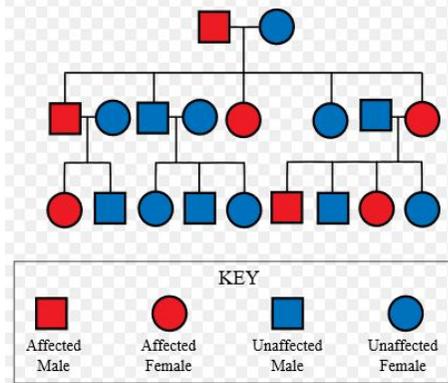


of the sessions	<p>using Mendel Laws. And we're going to analyze different diseases.</p> <p>In the second session we are going to learn The Central Dogma of Molecular Biology, how DNA makes RNA and how RNA makes proteins. For this, we are going to watch a video, and play a game to create a doll with a specific characters.</p>
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<p><i>The descriptions of the activities below should contain:</i></p> <ol style="list-style-type: none"> 1. <i>collaborative and cooperative activities instructions (including the timing and the language support)</i> 2. <i>type of support,</i> 3. <i>readings and writings planned,</i> 4. <i>assessment tools</i> 5. <i>materials used</i> 		Timing													
S E S S I	Activity 1	<ul style="list-style-type: none"> - Divide the class in 8 groups according the different colour of their hair. - Create a map mind about genetic inheritance concepts. <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <tr> <td>DNA</td> <td>ALLELES</td> <td>GENS</td> <td>HOMOZYGOUS</td> <td>RECESSIVE</td> <td>PHENOTYPE</td> </tr> <tr> <td>CHROMOSOMES</td> <td>GENOTYPE</td> <td>HAPLOID</td> <td>HETEROZYGOUS</td> <td>DIPLOID</td> <td>DOMINANT</td> </tr> </table> <ul style="list-style-type: none"> - ASSESSMENT: Writing strategies: Write a short explanation about this. 	DNA	ALLELES	GENS	HOMOZYGOUS	RECESSIVE	PHENOTYPE	CHROMOSOMES	GENOTYPE	HAPLOID	HETEROZYGOUS	DIPLOID	DOMINANT	10 minutes
DNA	ALLELES	GENS	HOMOZYGOUS	RECESSIVE	PHENOTYPE										
CHROMOSOMES	GENOTYPE	HAPLOID	HETEROZYGOUS	DIPLOID	DOMINANT										





O N I	Activity 2	<p>- Generate a poster with printouts about Mendel's Law. In these pictures there are Mendel's experiments. Formulate the three laws through this pictures.</p> <p>- ASSESSMENT: Write the three Mendel's Laws. Compare what they have written with the original ones.</p>		20 minutes							
	Activity 3	<p>- Problem: Analyse a family tree and describe how characters pass to the following generation.</p> <p>MODEL: Huntington's disease is a dominant autosomal hereditary disease. The family tree corresponds to a family affected by the disease. Analyse and answer following questions.</p> <ul style="list-style-type: none"> - What are the possible genotypes of all the members? - What is the probability that a person n.10 will develop the disease? - Decide what kind of inheritance is each tree. <p>- ASSESSMENT: Create an inheritance problem and design its family tree in order to know if you have understood the genetics naming. Use the correct words to describe this illness. Create a list of tips to understand what kind of disease develops in this family.</p>	<p>the</p>  <p>KEY</p> <table border="0"> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Affected Male</td> <td>Affected Female</td> <td>Unaffected Male</td> <td>Unaffected Female</td> </tr> </table>					Affected Male	Affected Female	Unaffected Male	Unaffected Female
Affected Male	Affected Female	Unaffected Male	Unaffected Female								
S E	Activity 4	<p>1- Divide the class in 8 groups according the different colour of their eyes. Reading strategies: Watch this video and take notes, then compare the notes with the rest of the group. https://www.youtube.com/watch?v=bKlpDtJdK8O&t=54s</p>	6 minutes								





S S I O N 2	Activity 5	<p>2-Read these paragraphs and put in the correct order according with the previous video.</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>The genetic material is stored in the form of DNA in most organisms. In humans, the nucleus of each cell contains 3×10^9 base pairs of DNA distributed over 23 pairs of chromosomes, and each cell has two copies of the genetic material. This is known collectively as the human genome. The human genome contains around 30 000 genes, each of which codes for one protein.</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>The Central Dogma of Molecular Biology states that DNA makes RNA makes proteins. The process by which DNA is copied to RNA is called transcription, and that by which RNA is used to produce proteins is called translation.</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>Transcription is the process of making an RNA copy of a gene sequence. This copy, called a messenger RNA (mRNA) molecule, leaves the cell nucleus and enters the cytoplasm, where it directs the synthesis of the protein, which it encodes.</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>Translation is the process of translating the sequence of a messenger RNA (mRNA) molecule to a sequence of amino acids during protein synthesis. The genetic code describes the relationship between the sequence of base pairs in a gene and the corresponding amino acid sequence that it encodes. In the cell cytoplasm, the ribosome reads the sequence of the mRNA in groups of three bases to assemble the protein.</p> </div> <p>3- Reading and writing:</p> <p>Put all this paragraphs beside the picture.</p> <div style="text-align: center;"> <p style="font-size: small; text-align: center;">Image adapted from: National Human Genome Research Institute.</p> </div>	10 minutes
	Activity 6	<p>Assessment activity: Competition to create a doll with defined characters.</p> <p>We organized the class in two groups. Each group has different sequences of DNA. Firstly they have to find the mRNA</p>	40 minutes



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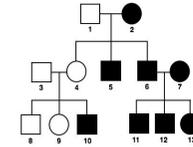
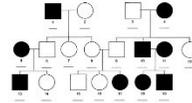
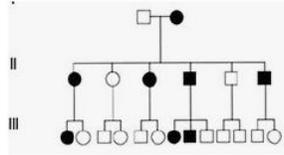
		<p>sequence. Secondly, using Genetic Code, they have to find the sequence of the proteins. Each protein means a phenotype character. They must find the correct character and create their doll.</p> <p>This activity has two possibilities. The first one consists in creating a doll with a plastic bottle, and the second one, using a drawing program in their mobiles as a TIC assessment activity.</p> <p>It wins the first group who has the doll correctly done. After that they must write a description of the doll.</p> <p>TIC ASSESSMENT ACTIVITY: To conclude this unit we'll do a contest about transcription and translation using quizlet.</p> <p>https://quizlet.com/99344368/transcription-and-translation-practice-flash-cards/</p>	
<p><i>In terms of academic content, what are the students learning and what are they learning to do?</i></p>		<p>Students are learning genetic inheritance vocabulary.</p> <p>Students are learning how characters pass through generations and they are learning how to analyze a family tree.</p> <p>Students are learning the Central Dogma of Molecular Biology and their reactions. They are also learning how our characters pass from DNA to proteins.</p>	
<p><i>In terms of language, what are the students</i></p>		<p>Students are learning and reading new vocabulary.</p> <p>Students are learning how to make an hypothesis and analysing the results.</p>	





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practicing or learning to do?	Students are learning how to write or summarize a process and explain conclusions. They are learning how to make an explanation with different steps.	
In what way is this lesson plan a good example of what we learnt in the GEP course session?	This lesson plan is a good example of what we do in GEP because the students are practicing how to understand a text in a foreign language, reading and writing in a cooperative way. English is the language they use and practice.	
Other important information		
ANNEXES (materials, handout, pictures... if not possible to include in the activity section.)	https://www.youtube.com/watch?v=bKlpDtJdK8Q&t=54s https://quizlet.com/99344368/transcription-and-translation-practice-flash-cards/ Handouts:	



1st LAW: The Law of Dominance: In this law, each character is controlled by distinct units called factors, which occur in pairs. If the pairs are heterozygous, one will always dominate the other.

An organism with alternate forms of a gene will express the form that is dominant.

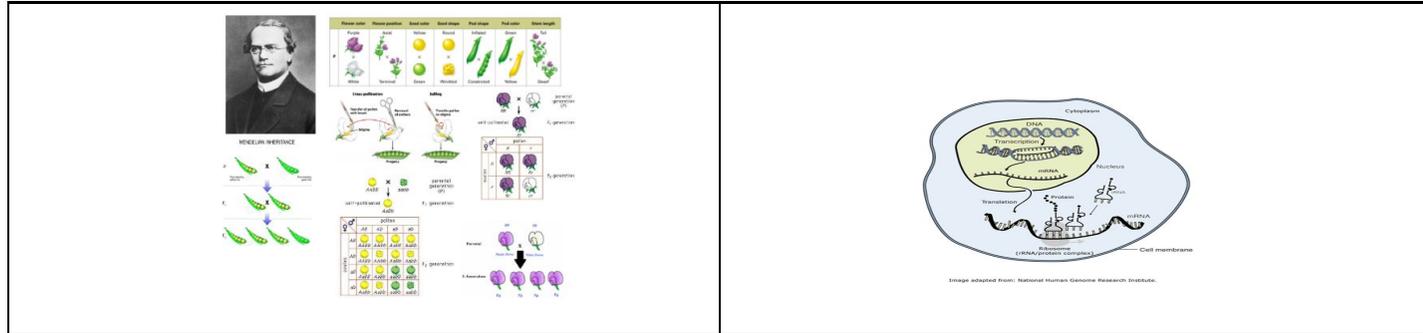
2nd LAW: Law of segregation is the second law of inheritance: This law states that the pair of alleles segregates from each other during meiosis (gamete formation) so that only one allele will be present in each gamete. The law of segregation is based on the fact that each gamete contains only one allele.

3rd LAW: The Law of Independent Assortment, law of recombination: Genes for different traits are sorted separately from one another so that the inheritance of one trait is not dependent on the inheritance of another.

- **Alleles or Variants:** Different forms (i.e. different DNA sequences) of the same gene or genetic locus. Often called A,B or A,a.
- **Diploid organisms:** Chromosomes come in pairs in (e.g. humans)
- **Genotype:** Pair of alleles at a locus (e.g. AA, Aa, aa)
- **Heterozygote:** genotype with different alleles on the two chromosomes (e.g. Aa)
- **Homozygote:** genotype with the same alleles (e.g AA, aa)



- **Phenotype:** An observable characteristic or trait
- **Diploid:** cells have **two** copies of each chromosome Haploid: cells have **only** one copy of each chromosome



Self assessment checklist

Task 2 : Reading, writing in CLIL and Assessment

YES/NO





1. Support is provided to help students read and understand texts.	YES
2. Before-, during- and after- reading activities are prepared.	YES
3. The materials use visuals to support comprehension.	YES
4. The writing process takes place in joint collaboration with the teacher (modelling)	YES
5. Support is provided to help students write (the students are provided with language patterns, language frames, vocabulary banks...)	YES
6. The teacher uses different strategies to help students throughout the process of reading and writing	YES
7. The teacher has previously predicted the language the students will need when carrying out the different tasks successfully and, therefore, is aware of the content-obligatory language .	YES
8. At least the teacher uses 1 type of assessment (self-assessment, teacher assessment or co- assessment)	YES
9. At least teacher used 1 type of designed assessment tool during the sessions (rubric, digital app, checklist, personal dossier...)	YES