LESSON PLAN FORMAT

SUBJECT	**Science**	**GRADE**	**9th**
TOPIC	**Mendel's Law**	**LENGTH**	**2 hours**

AIMS

MAIN AIMS

(What are the main aims of your lesson (content, language skills and language items)? What do you want your learners to have learnt by the end of this lesson?)

MAIN AIMS: By the end of the lesson students will have gotten to know how Mendelian genetic principles work and explain inheritance and improvement of existing species through reading and listening material that describes the theory emphasizing on key vocabulary.

SUBSIDIARY AIMS: learners will also be able to:

- **Listen and read for main ideas in order to learn about Mendel and Mendelian's theory.**
- **Explain Mendel's law through a web quest**
- **Reflect how the theory is applied to parents and children**

TEACHING OBJECTIVES

Content *(New knowledge, skills and understanding)*	**Cognition** *(High-order thinking skills, problem-solving, challenges and reflection)*	**Culture** *(Awareness of self and other, identity, citizenship, and pluricultural understanding)*
• **Revising vocabulary related to inheritance** • **Mendel's law theory** • **How Mendel's experiment works**	• **Summarizing how Mendel used cross- and self-pollination to produce first generation and second generation pea plants,** • **identifying the laws that Mendel wrote following his experiments as the law of dominance, the law of independent assortment, and the law of segregation** • **Reflecting on how important Mendel's law is to understand inheritance** • **Creating a web quest by summarizing the theory behind Mendel's law**	• **Working in pairs to discuss answers respecting people's turns and opinions.** • **Understanding why we look like our parents.**

Communication *(What and how)*

Students will work in groups to discuss questions. Students will summarize information to publish in a webquest. Students will work individually interacting with the material to read and listen for main ideas and details. T wil monitor language and provide a safe environment for error corrections. T will ask concept questions to interact with students and the material.

Language of Learning *(Key vocabulary – content-obligatory)* (Key vocabulary – contenry)	**Language for Learning** *(Functional language e.g. language while learners participate in the lesson – thinking skills)*	**Language through learning** *(Language progression, practice and extension – emerging language, and what you will do with this)*
GLOSSARY **alleles: different forms of a gene controlling a certain trait.**	**Description of theory** **Giving reasons**	**Teacher will explain the content students are to interact to by focusing on vocabulary. T will explain new concepts and how they work for a better understanding of the lesson.**

chromosome: a threadlike structure consisting of protein and tightly compacted **DNA with RNA, found in the nucleus of a eukaryotic cell.** **crossbreed: fertilization between separate organisms.** **cross-fertilization: see "crossbreed".** **dihybrid cross: a cross between plants that are heterozygous for two traits.** **F1 (first filial) generation: the first generation of offspring.** **F2 (second filial) generation: the second generation of offspring.** **gamete: a sperm or egg cell that has one-half the number of genes or chromosomes found in a typical body cell.** **gene: a distinct unit of hereditary information.** **genotype: the genetic makeup of an organism.** **heredity: the transmission of traits from parents to offspring.** **heterozygous: having two different alleles for a particular trait.** **homozygous: having two of the same alleles for a particular trait.** **hybrids: the offspring of crosses between parents showing contrasting traits.** **Law of Dominance: Mendel's law, or principle, which states that only the dominant trait will be expressed in an organism that is heterozygous for that trait.** **Law of Independent Assortment: Mendel's law, or principle, which states that alleles of one gene separate independently from the alleles of another gene during gamete formation.** **Law of Segregation: Mendel's law, or principle, which states that allele pairs separate during gamete formation with each gamete receiving only one allele from each pair. Allele pairs recombine when gametes come together in fertilization to form an offspring.**		

meiosis: a process consisting of two cell divisions that result in the formation of gametes. The second meiotic division reduces the number of chromosomes in half. **P (parental) generation: the generation of organisms which produce the F1 generation.** **phenotype: the physical characteristics of an organism.** **pollination: the transfer of pollen from a male reproductive organ onto the stigma of a carpel of a female reproductive organ, thus allowing fertilization to occur.** **probability: the likelihood or chance that an event will occur.** **punnett square: a box diagram that is used to predict the outcome of a genetic cross.** **pure-breeding: a parent that always produces offspring with traits identical to its own.** **recessive allele: an allele that is not expressed in an organism that is heterozygous for that allele's trait. Usually denoted by a lowercase letter, such as "y".** **self-fertilization: the process that unites male and female gametes from one individual organism.** **self-pollination: see self-fertilization.** **stamen: the male reproductive organ of a flower.** **trait: each difference in an inherited characteristic, such as yellow or green pea pods**		

CRITERIA FOR ASSESSMENT

(What kind of assessment will be used in class? (teacher, peer, self?) What are you assessing, how?)

Formative Assessment	**Summative Assessment**
● **Monitoring answers on main ideas of the reading and listening text to generate knowledge.** ● **Checking concepts through questions to generate accurate knowledge.**	● **A written quiz** ● **Creation of a web quest summarizing Mendel's law.**

LESSON PROCEDURE / ACTIVITIES			
Time	**Stage**	**Procedure**	**Materials & Resources**
5 minutes	**Warm up**	T will show some flashcards with pictures and write on the board the following words: Biology – Botany – Zoology – Ecology - Genetics. SS will match the name of each branch of the sciences with the picture that best represents it.	flashcards board Interaction: T-S M-S
10 minutes	**Lead in**	In groups of 4, SS will answer: What does genetics study? What does genetics do in their field of job? Do you think genetics is important?	Board Interaction: S-S
10 minutes	**Processing the text**	T will give a list of vocabulary to SS. They will listen to the video and highlight the words they hear. Then, T will give them the meaning of the words to match them to the corresponding ones. Then, together T and Ss will read and explain the meaning.	Youtube video: https://www.youtube.com/watch?v=Mehz7tCxjSE&t=58s List of words (copies) Interaction: T-S

15 minutes	**Identification and organization of knowledge (through listening)**	Ss will listen to the video again and answer the following questions: 1. Who discovered the principles of inheritance? 2.When Mendel crossed a pure green and a pure yellow pea plants, what did he obtain? 3. What are traits? 4. When do we have a heterozygous pea? T will check concept answers and explain a little bit to start consolidating learning.	Youtube video: https://www.youtube.com/watch?v=Mehz7tCxjSE&t=58s Notebooks Board Interaction: S-S
8 minutes	**Processing the text**	T will read the meaning of some words. Using the same list of words at the beginning of the class, SS have to guess which word their T is describing. T will write the words they guess appropriately. At the end, T will give them the complete glossary with the corresponding meaning.	Same copies (of vocabulary bank) Copies with glossary. Interaction: T-S
30 minutes	**Identification and organization of knowledge (through reading)**	Ss will be given a reading text. They must read and highlight key concept words. Then, they read again and answer these questions on their notebooks: 1. Why is Mendel consider the Father of Genetics? 2. Draw a graph explaining Mendel's experiment. 3. What is the difference between Homozygous and Heterozygous? 4. Summarize Mendel's law? T will monitor how SS are answering the questions, then she will check the answers and help SS consolidate learning.	Copies: reading text Interaction: S-S Reading text: adapted from: https://byjus.com/biology/mendel-laws-of-inheritance/ https://www.khanacademy.org/science/ap-biology/heredity/mendelian-genetics-ap/a/the-law-of-segregation

20 minutes	**Applying knowledge: use what it has been learned in context: Discussion task**	SS will work in groups of 4 and discuss these questions. Discussion questions: 1. What is the difference between a recessive and dominant gen? 2. Why do you consider Mendel's jobs was value in his time? Give two reasons 3. Nowadays, there are ways and methods to manipulate the DNA like cloning and G.M:O (genetic modified organism. Do you agree with this? Why or Why not? SS should appoint a spokesperson that will speak on behalf of the group sharing the group's answer.	Board Interaction: S-S
Out of class time	**Follow up: Applying knowledge: use what it has been learned in context**	Ss will create a Web quest where they must display information learned in the class focusing on this problem question: Why do we look like our parents? T will introduce the answer to the questions to help them think: Nowadays we know why we look like our parents thanks to Mendel's work. They must explain it in their web quest. Ss must work in groups of four or five. TIC teacher has already explained how to create a web quest in the previous grade.	Webquest platform Cellphones Computers
60 minutes	**Evaluation**	SS will take a quiz on the content learned.	Copies