Name _____

The Origin's Of Genetics (p. 162 – 169)

I. Mendel's Studies Of Characters

1. **Define the term heredity.**

Heredity – passing of characters from parents to offspring

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2. **Who was Gregor Mendel?** Austrian monk who studied 7 traits of pea plants (Counted and analyzed meticulously)

1900 – Rediscovery of work (50 years after death)

3. **What type of plant did he extensively study?** pea plants (Pisum sativum)

4. **Define the term genetics.**

Genetics – branch of Biology that focuses on heredity

5. **List three reasons why pea plants were useful for Mendel to study.**

Purple vs. white

1. Several characteristics have only two forms.

Self-fertilize, Cross-pollinate

2. Male + Female parts within same flower

p. 163 Traits

3. Small, grows easily, matures quickly, many offspring

II. Traits Expressed As Simple Ratios

1. **Define the term monohybrid cross.**

Monohybrid Cross – cross that involves one pair of contrasting traits

2. **Describe each step of Mendel's monohybrid crosses.**

Ex. TT = tall, tt = short

P Generation : True-breeding plants created as a result of self-pollination

F_1 Generation : Cross-pollination of two P-generation plants (Recorded # of F_1 plants)

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F_2 Generation : Self-pollination of F_1-Generation plants (Recorded # of F_2 plants)

3. **What was the significance of Mendel's observations?**

F_2 plants produced a plant different than F_1 plants

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III. A Theory Of Heredity

1. Offspring are not the result of traits blending.

Circle One : True (False)

2. Describe Mendel's four hypotheses of heredity.

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1. For a character, two copies of the gene (each parent)
2. Alternate versions of genes (alleles)
3. Principle of dominance
4. Alleles separate independently (Law of Segregation)

3. Match the genetics terms with the correct definitions.

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1. C	Alleles	A.	Non-expressed form of a character (tt = short)
2. F	Dominant	B.	Alleles of gene that are different (Ff)
3. A	Recessive	C.	Different forms of a gene (TT, Tt, tt)
4. G	Homozygous	D.	Physical appearance of a character
5. B	Heterozygous	E.	Set of alleles that an individual has for a character
6. E	Genotype	F.	Expressed form of a character (TT, Tt = tall)
7. D	Phenotype	G.	Two alleles of a gene that are similar (FF or ff)

Letter representation of a gene → (GeLe) → Genotype

(Physical) → Phenotype

4. An organism with a recessive allele for a trait will always exhibit that form.

Circle One : True (False) → Tt = tall

Only when dominant is not present → tt = short

IV. The Laws Of Heredity

P1 TT x tt (tall) (short)

F1 all Tt (tall)

F2 ¼ TT (tall), ½ Tt (tall), ¼ tt (short)

1. State the Law Of Segregation.

- Two alleles for a character separate when gametes are formed.

2. State the Law Of Independent Assortment.

-Alleles of different genes separate independently of one another during gamete formation

3. Define the term Punnett square. (p. 170)

Punnett Square - diagram that predicts the outcome of a genetic cross