MENDEL'S LAW OF GENETICS

SUBMITTED BY-

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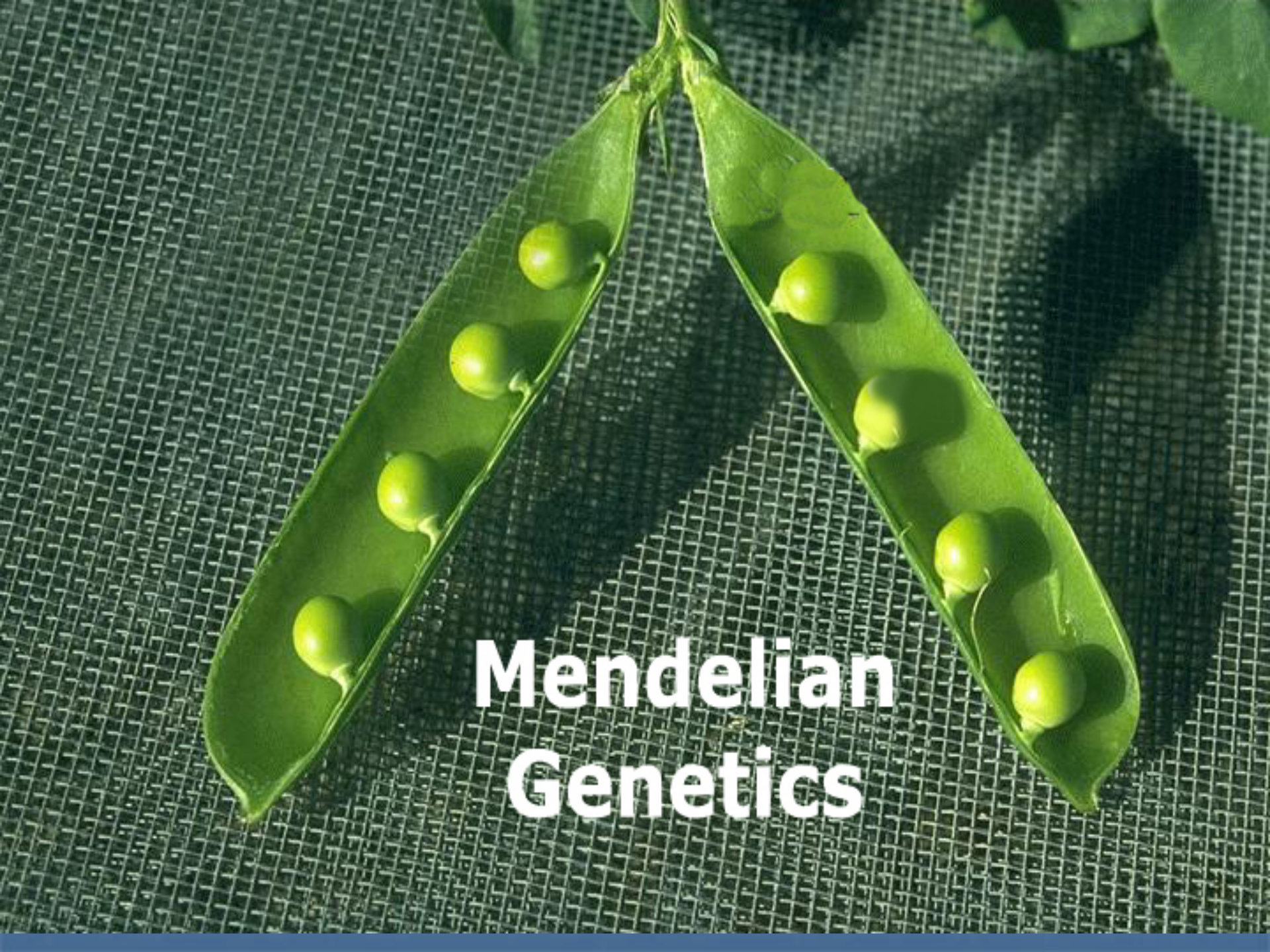
Mendelian
Genetics

MENDEL'S LAW OF GENETICS

SYNOPSIS

- INTRODUCTION
- HISTORY
- MENDEL'S SELECTION OF THE PEA PLANT EXPERIMENTAL REQUIREMENT
- CROSS PHENOMENON
- MENDEL'S LAW
- DRAWBACK OF MANDELISM
- SUMMARY
- CONCLUSION
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MENDEL'S LAW OF GENETICS

INTRODUCTION

- Genetics is the study of heredity.
- Where heredity is refers to the genetic transmission of characteristics from parent to offspring.
- A gene may have different forms referred to as alleles.

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HISTORY

- Mendel is appropriately called father of genetics.
- Mendel (1822-1884), an Austrian monk, was interested in understanding variances in plants.
- Between 1856 and 1863 cultivated and tested some 28,000 pea plants .

GREGOR MENDEL

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HISTORY

- 1905 Some genes are linked and do not show independent assortment, as seen by Bateson and Punnett.
- The word 'genetics' is coined by William Bateson in 1905.

REQUIREMENT OF PEA PLANT

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- The reproduce sexually
- They have two distinct, male and female, sex cell called gametes.
- Their traits are easy to isolate.
- These plant is found easily.
- And these plant's life cycle is very short.

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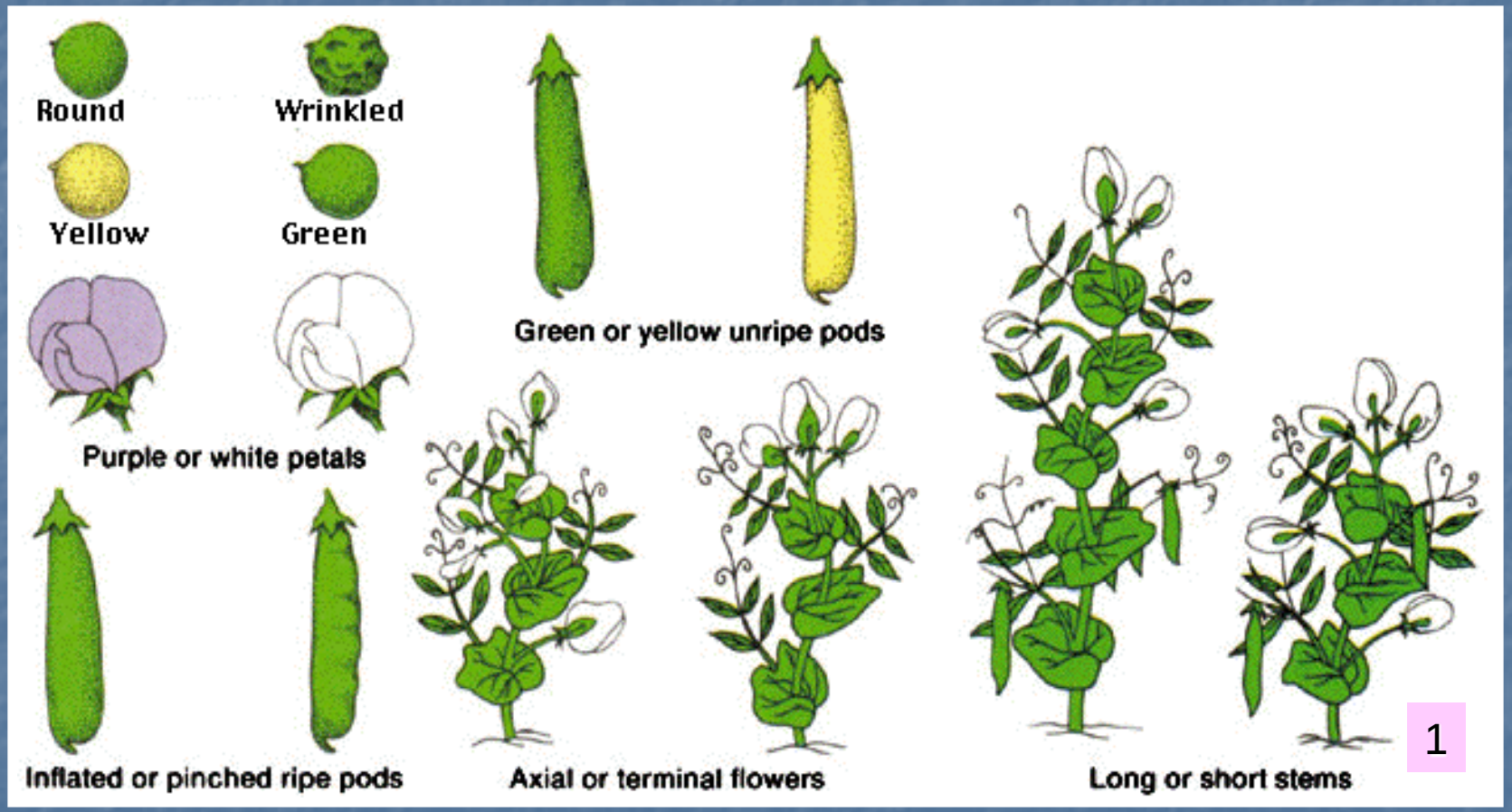
Pea Characteristics



Trait on the left is dominant. Trait on the right is recessive.

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PHENOMENON OF CROSS

1. MONOHYBRID CROSS

2. DIHYBRID CROSS

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MONOHYDRID CROSS -

The cross between in pea plant in the single pair 'or' cell of contrasting characters is known as monohybrid cross .

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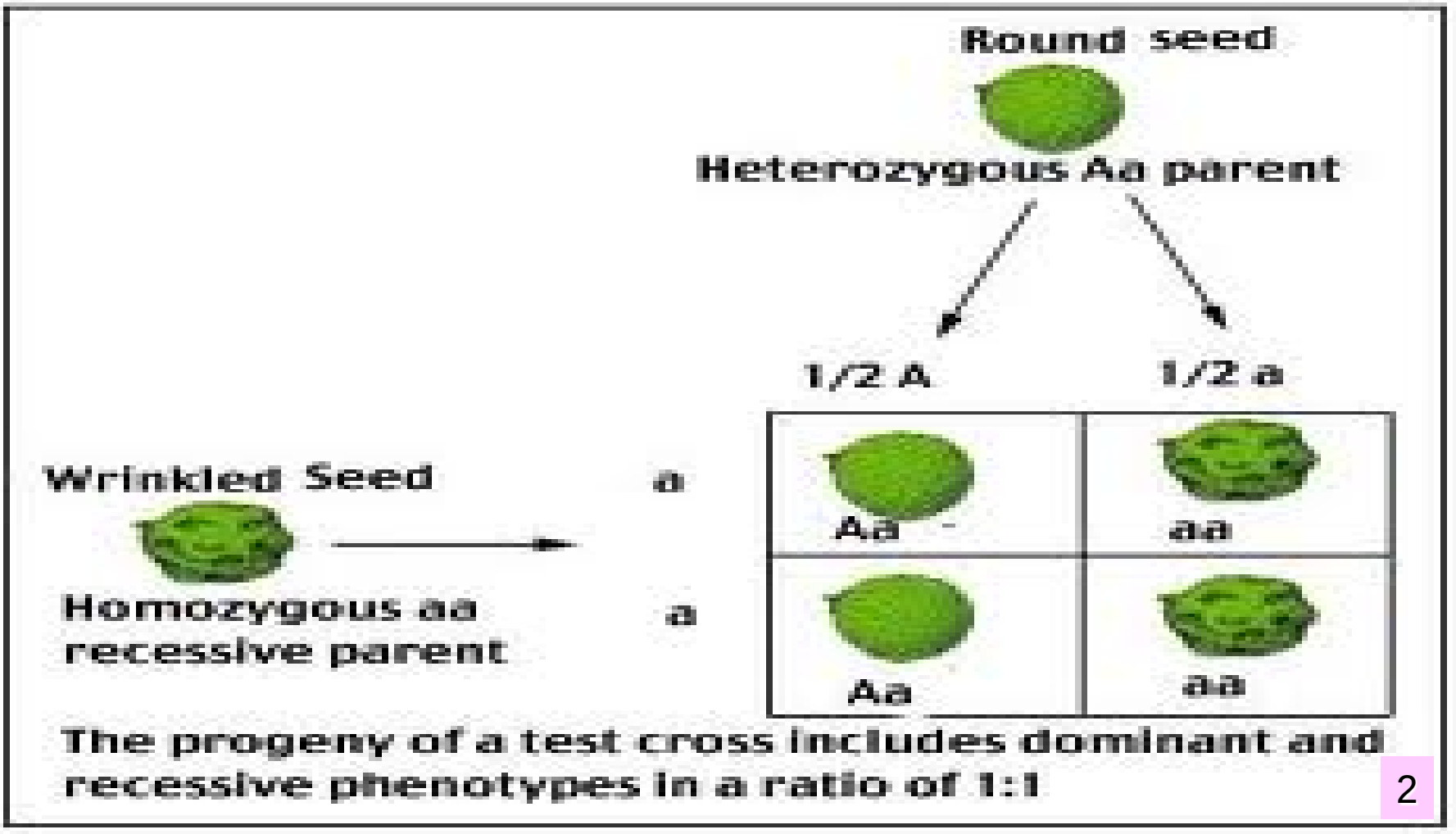

EXAMPLE OF MONOHYBRID CROSS

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DIHYBRID CROSS -

In this cross technique cross between two pair of contrasting characters.

Mendel took the two different contrasting characters. There for this cross is known as Dihybrid cross.

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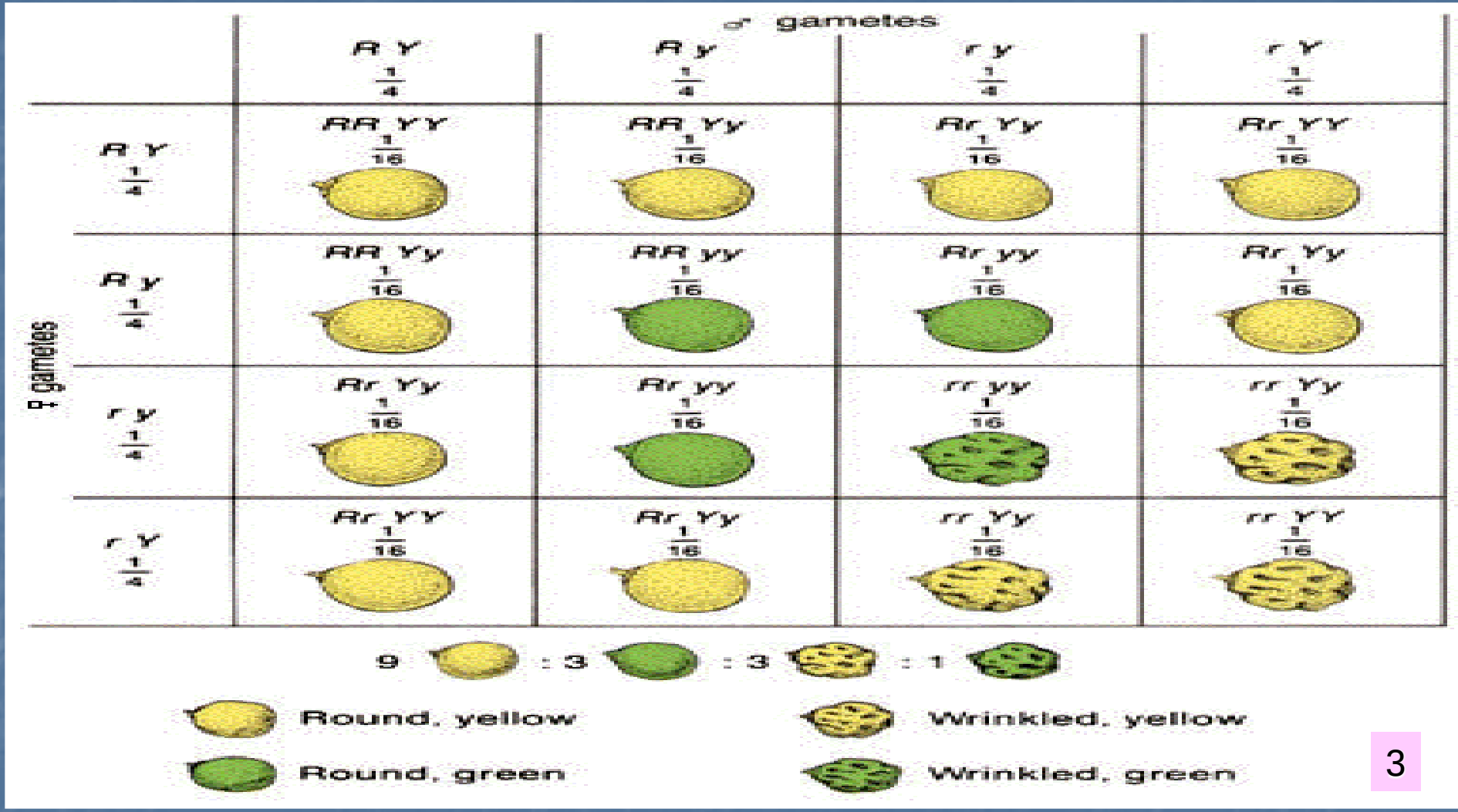

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EXAMPLE OF DIHYBRIDE CROSS

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Parents Genotype	RRYY	x	rryy
Parents Gametes	All RY		All ry
F1 Generation		All RrYy	
F1 Gametes, 2 of each		RY rY Ry ry	

Punnett Square of gametes produced

	RY	Ry	rY	ry
RY	RRYY	RRYy	RrYY	RrYy
Ry	RRyY	RRyy	RryY	Rryy
rY	rRYY	rRYy	rrYY	rrYy
ry	rRyY	rRyy	rryY	rryy

- Round and Yellow Phenotype
- Round and Green Phenotype
- Wrinkled and Yellow Phenotype
- Wrinkled and Green Phenotype

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The ratio of Dihybrid cross is 9:3:3:1

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- Law of dominance
- Law of segregation
- Law of independent assortment

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LAW OF DOMINANCE

- The trait that is observed in the offspring is the **dominant trait.**
- The trait that disappears in the offspring is the **recessive trait.**

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LAW OF SEGREGATION

- The two coexisting alleles of an individual for each trait segregate (separate) during gamete formation so that each gamete gets only one of the two alleles. Alleles again unite at random fertilization of gametes.

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PHYSICAL BASIS OF SEGREGATION

- Crossing over during prophase I
- Separation of sister chromatids during anaphase I followed by separation of homologous chromosomes during anaphase II
- The formation of chiasmata during the first meiotic division
- Separation of the two strands of DNA during DNA replication
- Separation of homologous chromosomes during anaphase I followed by separation of sister chromatids during anaphase II

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LAW OF INDEPENDENT ASSORTMENT

- The Law of Independent Assortment, also known as "Inheritance Law", states that separate genes for separate traits are passed independently of one another from parents to offspring.
- The genes for different traits are **inherited independently** of each other.

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LAW OF INDEPENDENT ASSORTMENT

- For each character, an organism inherits two genes, one from each parent. This means that when somatic cells are produced from two gametes, one allele comes from the mother, one from the father.

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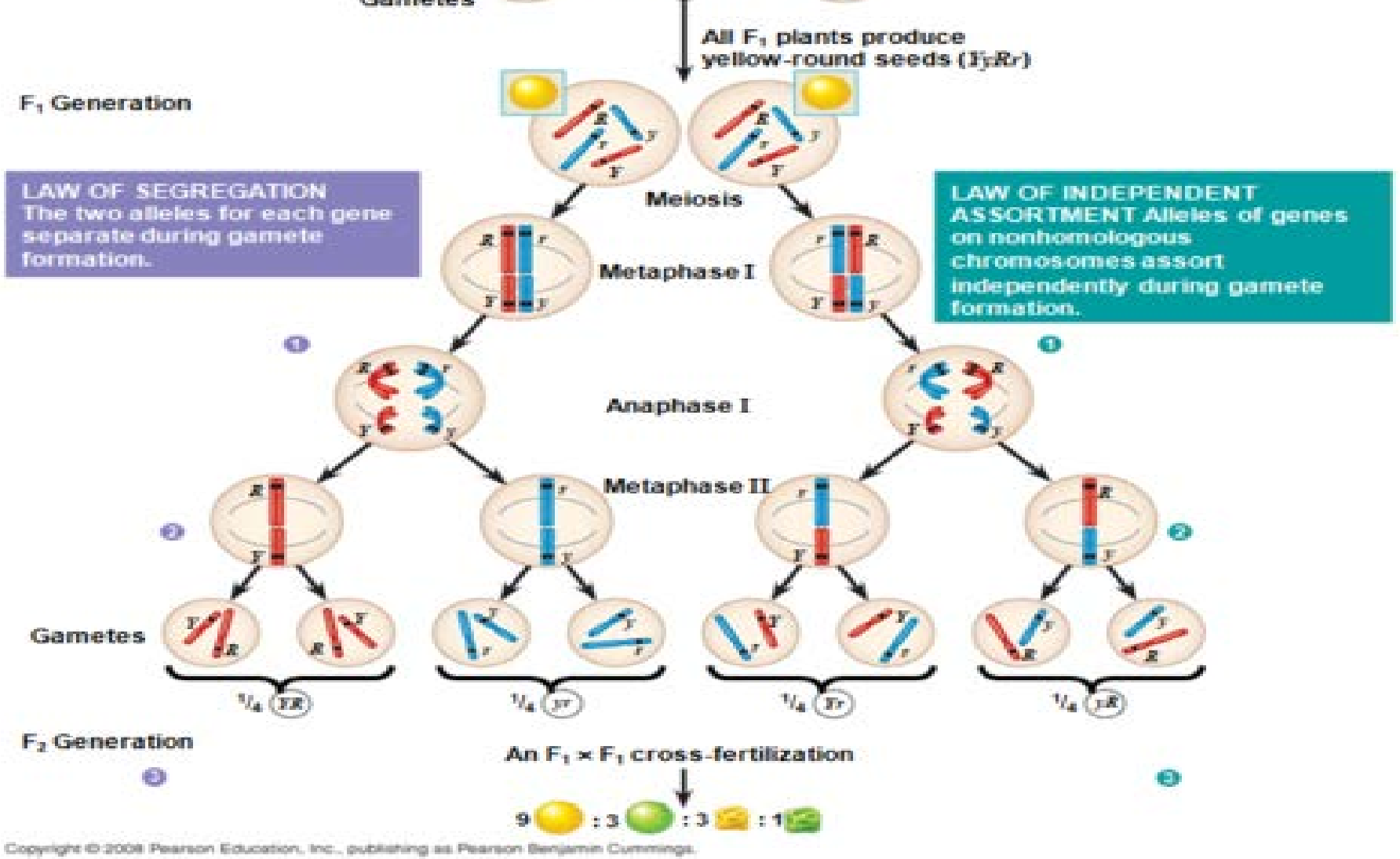
PHYSICAL BASIS OF INDEPENDENT ASSORTMENT

- Male and female gametes are produced in separate organs in separate individuals.
- There are two chromosome divisions in meiosis.
- Recombination (crossing over) occurs in mitosis.
- Pairs of homologous chromosomes are randomly separated during meiosis I.
- Sister chromatids do not separate until meiosis II.



DRAWBACK OF MANDELISM

- INCOMPLETE DOMINANCE
- CO- DOMINANCE
- PLEIOTROPHIC EFFECT
- EPISTASIS

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SUMMERY

- Mendel's law of genetics is use in genetics.
- Mendel use pisum sativum plant.
- The pisum sativum plant is found easily.
- These plant's life is short.
- Mendel was termed the 'factor' for gene.
- They would not apply to bacteria, for example, or to asexual reproduction.
- They do apply to the great majority of plants and animals.

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CONCLUSION

- Organisms inherit two copies of each gene, one from each parent.

- Organisms donate only one copy of each gene in their gametes. Thus, the two copies of each gene segregate, or separate, during gamete formation.

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REFRENCE

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CLASS NOTES 2012

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