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True Breeding = A parent reliably produces offspring that look like the parent when breed to a similarly true breeding parent

Later, this term will be replaced with "Homozygous"

Then Mendel had a little fun

- What if he breed true breeding green peas with true breeding yellow peas?
- What would happen if the genetic material is particulate?
- What would happen if the genetic material blends?











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Character:Trait

- A Character is a feature of an organism
 "Eye Color"
- Trait is a specific form of a character
 - "Green Eyes"

Gene:Allele

- A Gene is the fundamental unit of inheritance. • A "Gene for Eye Color"
- An Allele is a specific sequence of DNA from a
- gene

• An "Allele for Green Eyes"



Vocabulary Check

- Character: A general feature of an organism hair color
- Trait: A specific state of a character brown hair
- Gene: A fundamental unit of inheritance gene for hair color • This will be expanded on as we learn more
- Allele: a specific version of a gene the allele for brown hair
- Dominant trait: The state of a trait that is expressed (observable) even when other alleles are present
- Recessive trait : The state of a trait that can only be expressed when a the allele for a dominant trait is absent









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A note on symbols • Often a capital letter of the dominant phenotype is used • Experiment If Yellow is dominant: • Y (capital) would be the Yellow allele • y (lowercase) would be the Green allele • Modern molecular techniques (DNA sequencing) have Green) changed how genes and alleles are symbolically represented • What matters is you know the difference between gene, allele and that a variety of symbolic conventions can be used

Mendel's First Law

- Parental Generation: true breeding Green and true breeding yellow peas are crossed.
- The F1 generation are all Yellow (Yellow dominant to
- Cross the F1 Yellow peas with themselves to the the F2 (Second Filial Generation)
- Look at the F2 peas







































YR

Yr

уR



YyRR YyRr yyRR

уR yr YyRr Yyrr yyR yyrr

yyRr









YYRR YYRr

YYRr

YyRR

We know from the F1 generation that: Yellow is dominant to Green Round is dominant to Wrinkled

YR Yr

YYrr

YyRr yyRR

уR yr

YyRR YyRr

YyRr

yyRr yyrr

Yyrr

yyRr



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	уR	YyRR	YyRr	yyRR	yyRr				
	yr	YyRr	Yyrr	yyRr	yyrr				
These possible progeny all have the dominant gene from at least one parent for Shape BUT both recessive genes for Color									































lf dc pr pf	we hypo b have th redict if v eas?	thesize th e genoty ve self cro	at the F1 pe YyRr, w pss the F1	progeny r /hat do w yellow ro	eally e und	
	F1 progeny: VyRr	YR	Yr	уR	yr	
	YR	YYRR	YYRr	YyRR		
	Yr					
-	уR					
	yr		?			
-						
						58







Yyrr

yyRr

YyRr

YyRr yyRR

Yr YYrr

yr YyRr Yyrr yyR yyrr

YyRR уR







Yellow is Round is	dominar dominar	nt to Gre it to Wri	en nkled		
F1 progeny: VyRr	YR	Yr	уR	yr	
YR	YYRR	YYRr	YyRR	YyRr	
Yr	YYRr	YYrr	YyRr	Yyrr	
уR	YyRR	YyRr	yyRR	yyRr	
yr	YyRr	Yyrr	yyRr	yyrr	
	This poss	ible prog	eny has		







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Mendel's Laws

- The First Law (Law of Segregation)
 - Mendel's Experiment revealed the particulate nature of genes • We will focus on this
- The Second Law (Law of Independent Assortment) • Mendel's Experiment revealed that in general, each character has its own gene and alleles and they are passed down to offspring without regard to any other gene or allele
 - The results anticipate the role chromosomes play in genetics We can discuss this if you want