

hey

Mendelian Genetics

Mendel suggested heredity resulted in:

discontinuous variation

(dominance and recessiveness)

Darwin and Wallace subscribed to theory of:

continuous variation

- offspring are a blend of their parents

What is the chromosomal theory of inheritance?

- genetic material is contained in chromosomes
- segregation leads to variation

How is diploid organisms DNA formed?

- in gamete formation = n
- when gametes combine = $n + n = 2n$

Brain dump the correlation between chromosomes and Mendel's 3 postulates.

unit factors $\rightarrow$ first meiotic prophase

segregation $\rightarrow$ chromosome split

Independent assortment $\rightarrow$ genetic variation is from
non-identical homologous chromosomes

What are the criteria for homologous pairs of chromosomes?

Same size and centromere location

can synapse & same gene loci

one from mom, one from dad (biparental inheritance)

What is the sum law?

Used to find probabilities independent of each other

$$1/4 + 1/4 = 1/2$$

What is a chi square analysis? What is chance deviation?

- evaluates the effect of chance deviation
- chance events subject to random fluctuations

List the two factors that can predict gene outcomes:

- sample size
- independent assortment

What is a null hypothesis? What is an alternative hypothesis?

Null = H_0 = No difference/deviation

Alternative = H_a = There is a difference

How do we calculate degrees of freedom? If you were given 4 possible outcomes, what would be the degree of freedom?

$$n - 1$$

$$4 - 1 = 3 \text{ df}$$

Using the degrees of freedom calculated above, what is the chi value if you calculated a P value of 0.598? (need chart)

$$0.90$$

Complete a chi square analysis using the following information:

A scientist completed an experiment and concluded that 345 of her plants were tall and yellow, 110 were tall and green, 99 were dwarf and yellow, and 37 were dwarf and green. Does this fit Mendel's 9:3:3:1 ratio?

9	345	$9/16 \cdot 591 = 332.44$
3	110	$3/16 \cdot 591 = 110.81$
3	99	$3/16 \cdot 591 = 110.81$
1	37	$1/16 \cdot 591 = 36.94$
	591	

$$\frac{(345 - 332.44)^2}{332.44} = 0.47$$

$$\frac{(110 - 110.81)^2}{110.81} = 0.0059$$

$$\frac{(99 - 110.81)^2}{110.81} = 1.26$$

$$\frac{(37 - 36.94)^2}{36.94} = 0.000$$

$$\begin{array}{r}
 + 0.47 \\
 0.0059 \\
 1.26 \\
 \hline
 1.73
 \end{array}$$

$$df = 4 - 1 = 3$$

(use chart)

$$0.75 \text{ to } 0.50$$

$$= 0.025$$

$$p > 0.025$$

fail to reject null