Topic 1.2: How is hereditary information passed from one generation to the next?

- _____ pass on inherited traits from parent to offspring.
- _____ squares show the _____ of offspring inheriting specific traits.
- Both _____are expressed in _____.
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- In _____ dominance, alleles are _____ dominant nor recessive.
- Some _____ traits are due to alleles on the _____.

Concept 1: _____ pass on inherited traits from parent to offspring.

_____**:** field of biology that studies heredity, or the passing of traits from parents to offspring

Trait: an _____characteristic, such as _____ or _____

_____ discovered how traits are inherited by experimenting with pea plants.

- Mendel used _____ pea plants that produce offspring with _____ form of a trait.
- Parent plants produced new plants called _____ in the _____(F_1).
- Plants from the first generation were allowed to _____ to produce offspring in the _____ (F_2).
- When two different true-breeding pea plants are crossed, one trait _____ in the F_1 offspring, but _____ in the F_2 offspring.

  Based on this observation, Mendel proposed:

  - Each plant has _____ factors for a trait.
  - Each parent gives _____ factor for each trait.
  - _____ factor dominates over the other if present.
  -

The “factors” Mendel referred to in his conclusions are what we now call_____.

_____ may carry different alleles.

During _____formation, pairs of _____ chromosomes separate.

Each gamete receives _____ member of each pair, so it receives only ___ allele of each pair.

During fertilization when the male and female gametes meet, _____ chromosomes

and _____ are paired again.

Law of_____ **:** states that alleles for a trait separate during _____

Each _____carries one allele for each trait.

During fertilization, each gamete contributes an _____for each trait.

- Alleles that are _____will always be expressed if present.
- Alleles that are _____will be expressed only if there are two _____ alleles.
- _____ alleles are represented with a _____letter.
- _____ alleles are represented with a _____letter.
- _____ flower colour = *BB* or *Bb*
- White flower colour = _____
- **Phenotype:** the _____ of an organism’s trait
- _____**:** the specific combination of alleles an organism has for a trait
- _____**:** an organism with two of the same alleles for a particular trait
- **Heterozygous:** an organism with two _____ alleles for a particular trait
- There are _____ possible genotypes:

1) _____ *dominant*: two dominant alleles

2) _____ *recessive*: two recessive alleles

3) _____: one dominant allele and one recessive allele

1. Write a definition for genetics in your own words.
2. Seed shape in pea plants can either be round or wrinkled. The allele for round shape is indicated by *R*. Is round seed shape dominant or recessive?
3. The allele for freckles is indicated by *F*.
   What is the genotype of a person who is heterozygous for freckles?

Concept 2: Punnett squares show the _____ of offspring inheriting specific traits.

- _____ is a deliberate mating between a genetic male and a genetic female.
- _____ considers one trait.
- _____ is an offspring that has _____ traits from its parents.
- A _____ is a tool used to help determine the _____ of
- inheriting traits in a _____ cross.
- It shows the _____ of the parents and the offspring.
- _____ *ratio* shows the frequency of the phenotypes in offspring.
    - Example: __ purple flowers: __ white flower
- _____ *ratio* shows the frequency of the genotypes in offspring.
    - Example: __ *BB*:__ *Bb*:__ *bb*

1. A monohybrid cross produces half the offspring with one genotype and half the offspring with another genotype. Express this in the form of a ratio.
2. What do the alleles that are written along the top and beside a Punnett square represent?

Concept 3: Both alleles are expressed in _____.

- _____**:** the condition in which both alleles for a trait are equally expressed
- in a heterozygote; both alleles are _____

- _____ alleles are represented by _____ letters with a superscript for each allele
    - Example: _____
- _____ is a genetic disorder where the red blood cell is C-shaped
- (_____) and therefore cannot transport oxygen effectively.
- People who are _____ with the sickle cell trait are resistant to the life-threatening disease malaria.

1. What is codominance? Give three examples of codominance.
2. Hypothesize why the frequency of the sickle cell allele is much higher in Africa than in other areas of the world.

Concept 4: In _____ dominance, alleles are neither dominant nor recessive.

- _____ **dominance:** a condition in which _____ allele for a gene
- completely conceals the presence of the other; it results in _____expression of a trait
- Example: Four o'clock flowers can be red, _____, or white.
- Use _____ letters with superscripts to represent _____ dominance.

1. What is the difference between incomplete dominance and codominance?
2. A plant that produces white flowers is crossed with a plant that produces purple flowers. Describe the phenotype of the offspring if the inheritance pattern for flower colour is
    a) incomplete dominance
    b) codominance

Concept 5: Some inherited traits are due to alleles on the _____.

- _____**-linked trait:** a trait controlled by genes on _____ chromosomes
- **_____-linked trait:** a trait controlled by genes on the _____ chromosome
- Males are affected by recessive _____ traits more often because they have only

- one _____.

- Red-green colour vision deficiency is a _____ trait.

- _____ is a female that has one recessive allele on one of her X chromosomes.

1. What are sex-linked traits?
2. Use vocabulary terms to describe the genotype of a male who is red-green colour vision deficient.

Topic 1.2 Summary: How is _____ information passed from one generation to the next?

- _____ pass on inherited traits from parent to offspring.

- _____ show the probability of offspring inheriting specific traits.

- Both alleles are expressed in _____.

- In _____ alleles are neither dominant nor recessive.

- Some inherited traits are due to alleles on the_____.