

Checkpoint 6 LS3-2 Review

"I can use evidence to verify a claim that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) errors during replication, and/or (3) mutations caused by environmental factors."

For the following question, select **true or false**. If you answer true, explain why it is true citing evidence from class. If the answer is false, change the sentence to make it correct.

1. Many genes can be switched during a crossing over event.

True- When crossing over occurs, a section of a chromosome is swapped with that section of the homologous chromosome. These sections can contain many genes, so there are multiple genes switched during crossing over.

A trisomy 21, also known as Down Syndrome occurs when an individual has 3 copies of chromosome 21. Knowing this, answer questions 2 and 3.

2. In what stage(s) of meiosis could an event occur that would cause this disorder?

This can occur during anaphase I or anaphase II.

3. What is the process that created the error called?

Nondisjunction- when chromosomes fail to separate properly

4. Name and describe the 4 mutations discussed in class.

Insertion- one or more bases are inserted into the DNA sequence

Deletion- one or more bases are deleted from the DNA sequence

Duplication- one or more bases are duplicated and inserted into the DNA sequence (for example- ATGCG would become ATATGCG)

Substitution- one base is substituted for another base in the DNA sequence

5. Do mutations always result in a change in phenotype (phenotype are observable traits)?

No, sometimes mutations can occur and you may never know because the mutation is not expressed in a trait that is visible. These are called silent mutations.

6. Do mutations change genotype (genotype is the genetic makeup of a cell)?

Yes, when a mutation occurs there is a change in the DNA sequence, so there is a change in genotype.

7. Why do dentists put a lead jacket on you when they do x-rays? Justify your answer with evidence. (Hint: Look at the "I Can")

X-Rays are considered a mutagen, a physical or chemical agent that can cause mutations. The lead vest that dentists cover you with acts as a shield from the x-rays to prevent damage to your DNA.