

NOTES: Unit 5A (Mutations)

Topic 1: Sometimes genetic codes _____

- Changing the letter codes of a gene code = _____

A) Mutation _____: DNA blueprints can acquire mutations in various ways

1) During DNA _____

- Base pairing mistakes can happen but most are _____ but an army of repair enzymes (i.e., _____)

2) Exposure to powerful _____

- _____ smoke, smokeless tobacco, exhaust from burning petroleum fuels & coal, pesticides, herbicides, alcohol, gasoline, sawdust from CCA “outdoor” lumber, paints, asbestos

3) Exposure to powerful _____

- _____ (nuclear fuel and bombs)
- _____ (at hospitals and dental offices)
- _____ (from sunlight and tanning beds)

4) Exposure to _____

- Some viruses _____ their DNA into the middle of the host cell’s DNA

5) Exposure to _____ from metabolizing food and oxygen called reactive _____

B) Mutation _____

Original gene → **mutated** gene

1) _____ = add 1+ letters Ex. TAGACAT → TAGACCAT

2) _____ = lose 1+ letters Ex. TAGACAT → TGACAT

3) _____ = switch 1+ letters Ex. TAGACAT → TAGAGAT

C) Mutation _____: Did the mutation change any of the protein’s _____?

1) _____ effect = NO Amino Acids Changed → _____ shape

2) _____ effect = FEW Amino Acids Changed → _____ shape change

3) _____ effect = MANY Amino Acids Changed → _____ shape change

*** KEY IDEA: Any changes to the protein’s _____ usually results in a _____ in the protein’s _____

Mutations Conclusions:

- Any protein _____ than the original probably will NOT fold into the same 3-D _____ = NOT FUNCTION = cause a _____ problem

- Most mutations have a _____ (-) effect that lowers an organism's chance for survival

EXAMPLES:

- Some mutations have a _____ (+) effect for an organism in a certain environment that helps them better survive the challenges of life

EXAMPLES:

- Accumulating DNA mutations often leads to diseases like _____
- Only DNA mutations in _____ or _____ cells can be inherited
 - These inherited mutations often cause a variety of genetic _____
- Some viruses mutate in _____ because mistakes during _____ of their genetic material are NOT fixed by proofreading repair enzymes
- This leads to new _____ of disease-causing viruses that sometimes emerge to cause major health _____
- This happens because people have little immunity to the viruses' newly-shaped _____

Mutation Analogy: Translating mRNA into a protein can be like understanding an English sentence

English Sentence: **THE ONE BIG FLY HAD ONE RED EYE**

English Sentence #	Mutation Type?			# of letters <u>different</u> from the original sentence	Mutation Effect on sentence meaning?		
	addition	deletion	substitution		NONE	SMALL	BIG
1							
2							
3							
4							
5							
6							
7							