BTR ( ): CF

1) Use your notes to explain the differences between the following terms:

- gene vs. allele: _____

  _____

- genotype vs. phenotype: _____

  _____

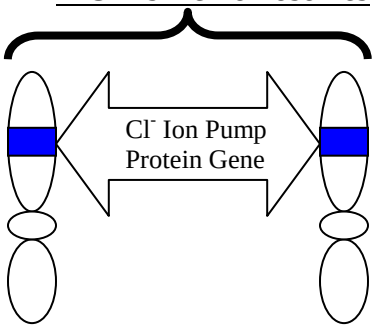
- homozygous vs. heterozygous: _____

  _____

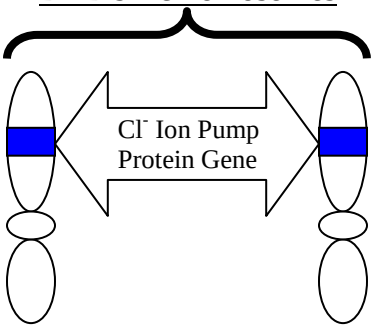
CF Gene Notation _____ = _____

Symbols Used: _____ = _____

MOM's 2 chromosomes



DAD's 2 chromosomes



Parent **Genotypes**: MOM = ___ ___ Dad = ___ ___

Mom's Egg Varieties

Dad's Sperm varieties

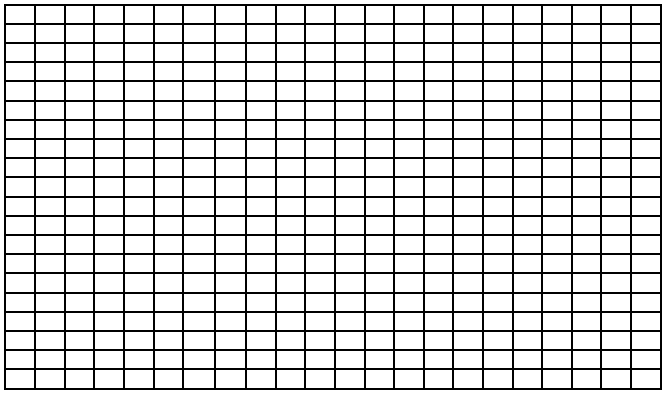
Mom's Egg Varieties

Dad's Sperm varieties

UV n Mutation Graph

A student wanted to study the relationship between UV light exposure and bacterial mutation rate. She placed one colony of bacteria under each of the following experimental conditions (sunlight, 100W, 200W, 300W & 400 Watt UV tanning bulbs) and then recorded the number of mutations after three days in the data table below.

Mutation Rate Data	
Light Conditions	# of Mutations
Sunlight	15
100 W UV	13
200 W UV	17
300 W UV	25
400 W UV	40



Create a **graph** of the data above. Be sure to include a proper title, label axes with units, appropriate number scales, and correctly plotted data including a key if needed.

1. Identify the **Independent** variables from this experiment _____
2. Identify the **Dependent** variables from this experiment _____
3. Identify 2 variables that should be held **constant** for this to be a valid experiment

4. Identify the **Control Group** in this experiment, or suggest an appropriate control group if one was not part of the experimental design.

5. Based on the student's results, provide a **conclusion** for the student's question: how does UV light exposure impact bacterial mutation rate?

6. Predict the # of mutations for a bacteria colony under a **350** watt UV tanning bulb? _____
7. Predict the # of mutations for a bacteria colony under a **450** watt UV tanning bulb? _____

8. Upon closer observations, the student noticed that sometimes the mutations crippled the bacteria to the point that they could not complete cell division. A few bacteria, however, began to produce a crusty, black pigment that protected them from UV mutation damage. The student also noticed that every once-in-a-while a mutation in the DNA did not change any of the proteins that the bacteria were making. Which of the following is the BEST conclusion about the IMPACT of mutations on bacteria cells?
   a. Mutations are harmful to bacteria
   b. Mutations are helpful to bacteria
   c. Mutations have no effect on bacteria
   d. Mutations can be helpful, harmful, or neutral to bacteria

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Stand Where You Believe

Circle → YES NO Maybe…it depends on:

1) Explain: _____

_____

_____

_____