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5.3 FRUIT FLY INHERITANCE: PART B PREDICTING OFFSPRING INSTRUCTIONS

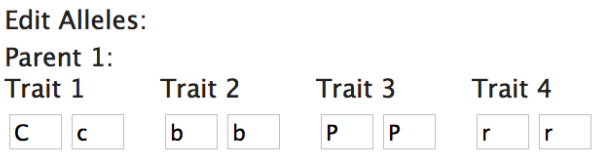
With your partner, complete the following to determine ALL possible offspring of two of your fruit flies.

Step 1: Determine your parent fruit flies

1. Roll a die until you roll either a 1, 2, or a 3 which will tell you whether you will use fruit fly 1, 2, or 3.
2. Then let your partner roll to determine which fly they will use.

Step 2: Create a four-gene Punnett square

1. Go to the following website: scienceprimer.com/punnett-square-calculator
   (Link also posted under daily agenda on our website)
2. On the webpage is the Punnett square calculator that you will use. First set up the calculator:
   a. First change the number of traits. The calculator defaults to two traits; use the slider to change it to four traits (eye color, body color, wing shape, and wing spots). The Punnett square should enlarge to be 16x16 boxes.
   b. Just below the slider is a button that says "Show Frequencies"; click on it. A black box should appear on the right with a variety of colors and percentages; the list will be long, but don't worry! Your list will be much shorter.
   c. Scroll down the page a bit to the "Edit Alleles" section.
      i. Decide between you and your partner which fruit fly will be "Parent 1" and which fruit fly will be "Parent 2"
      ii. For Parent 1, change the allele boxes to the same alleles as the fruit fly.
      Example: chromosomes show "Cc bb PP rr", enter these into the boxes to look like:



      iii. For Parent 2, do the same by changing the allele boxes to the same alleles as the second fruit fly.
   d. Next identify the dominant alleles by selecting the buttons that have the dominant allele (capital letter) so it looks like this:

      (*Note: your alleles may not be listed exactly the same and the dominant allele may not be listed first.)
   e. Lastly, select the buttons under the "Show" section. Select the "Phenotypes" and the "Percent" buttons
   f. Observe your Punnett square. It should have a variety of colors, where each color is a distinct phenotype.
   g. In order to use your Punnett square for the second portion of work (which may take you into the second day of this project), you can take a screen shot (using the keys shown below) and saving the image on your Google drive.

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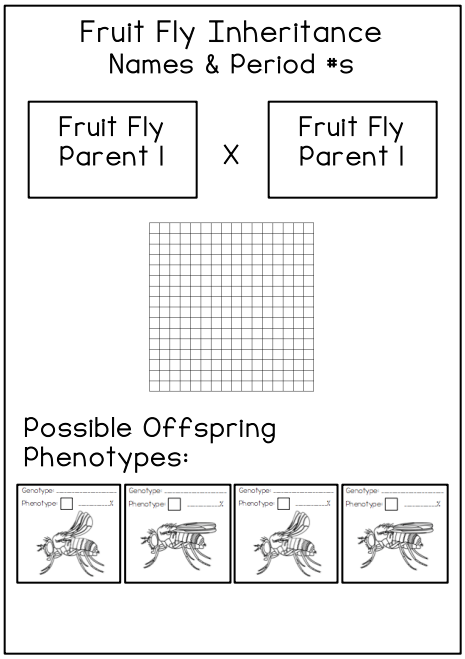
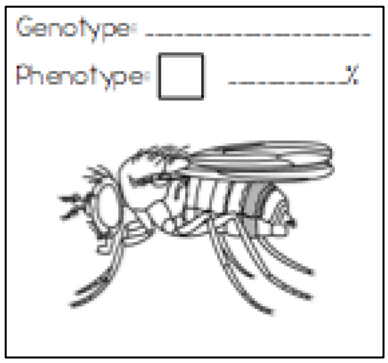
Step 3: Create your poster demonstrating possible offspring *Use the example on the board as a guide!*

1. Collect a large poster for you and your partner. At the top label it "FRUIT FLY INHERITANCE" with your names and period # below.
2. Set up your poster to look like this →
3. Paste the parent fruit fly pages on the poster
4. Next the fun coloring part! Color your Punnett square to match the Punnett square from the online calculator.
5. Because each color represents a different phenotype, you will also create an offspring fruit fly as seen below.
6. For each possible phenotype, create a card with a listed genotype, the color associated with its phenotype, and the percent chance (as seen on the Punnett square calculator).
   Note: it is possible to have more than one genotype for a given phenotype. If this is the case, choose whichever genotype to write on your offspring fruit fly.
7. Paste each offspring under the large Punnett square.





YOU HAVE UNTIL THE END OF THE CLASS PERIOD ON WEDNESDAY TO FINISH!