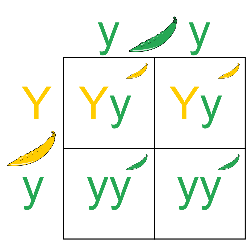
Unit 6 : Mendel and Genetics

Daily Warm Ups

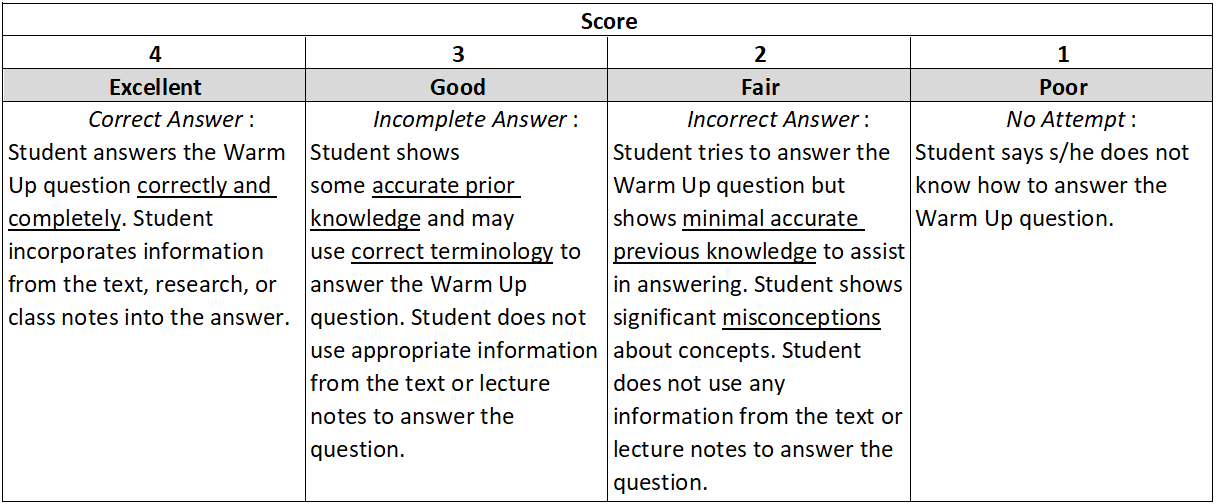


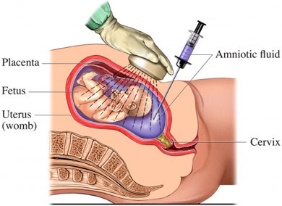


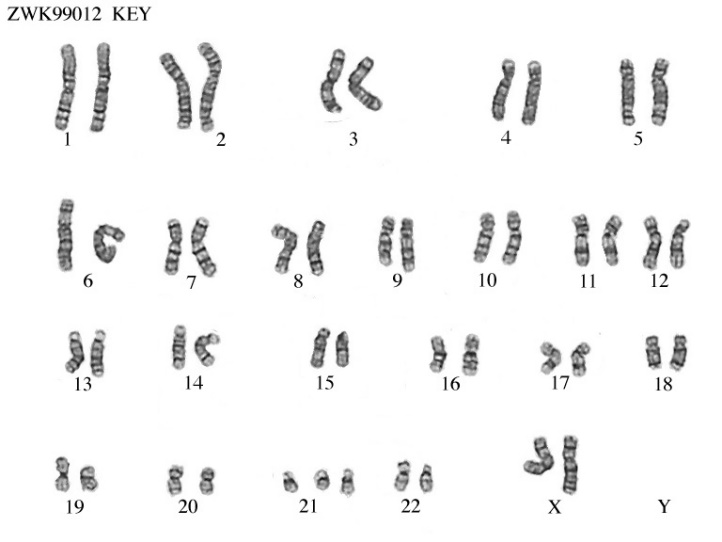
The very first thing that you will do every day when you walk into class is a science warm up. This will usually be a question that will either get you thinking about what we will be learning that day or will help you think about what we learned during the day before. You should first try to answer the question from your own memory and using your own thoughts but, if you are having difficulty, you may look for the answer outside the class (book, internet, etc).

*At the end of the week you will hand them in.  This booklet will be glued into your BILL on test day.* You can change your answers at any time prior to when it is graded (in fact, it is **encouraged!**Learning is a process). If you ever miss a day, it is your responsibility to make-up the warm ups for the day you missed.

Warm Up questions are worth 4 points each. I will be looking for any misconceptions you might have, how thoroughly you answer a question, how much you used resources available to you, and even how well a particular Warm Up question is constructed.

**Scoring Rubric:**  


**Da**t**e \_\_\_\_\_\_\_\_\_\_**

**Concept covered: Karyotpyes**

A. How many chromosomes does this person have? \_\_\_\_\_\_\_\_\_

B. What is the normal human chromosome number? \_\_\_\_\_\_\_\_\_

C. Is this karyotype showing a monosomy or trisomy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

D. What is this disorder? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

E. Is this person male or female? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Nondisjunction**

Watch the following animation: <https://www.youtube.com/watch?v=EA0qxhR2oOk>

1. Describe how nondisjunction happens? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. During which phase of Meiosis did the nondisjunction happen in the video? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

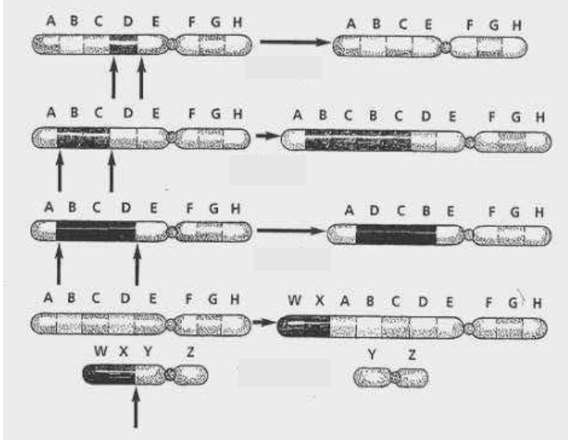
3. Which other phase of Meiosis could the nondisjunction happen? Sketch how it happens in the space below.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Chromosome Mutations**

The normal chromosome is shown on the left. The mutated chromosome on the right. Letters A-H are genes. Identify which mutated chromosome shows ***Translocation, Inversion, Deletion, and Duplication***

A. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

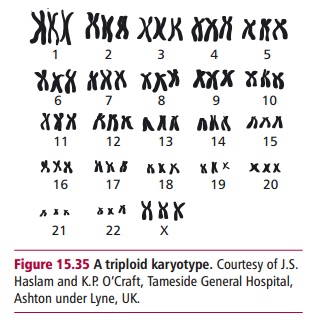
C. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

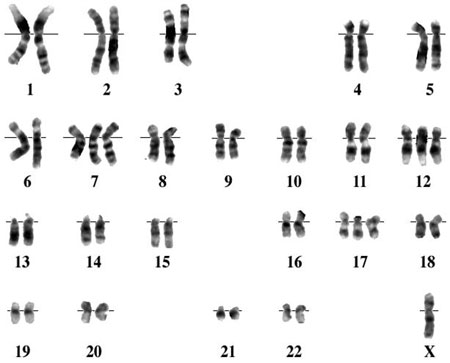
D. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

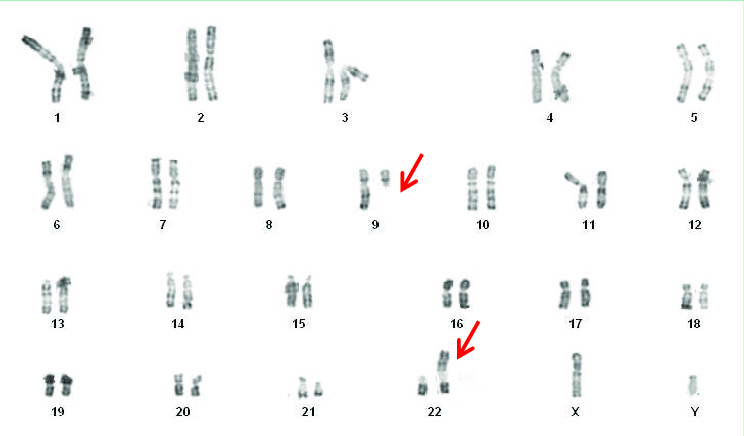
Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Chromosome Mutations#2**

Write the term that best matches the karyotype. Choose from the following: ***duplication, aneuploidy, haploid, euploidy, translocation, inversion.***









Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Genetics Terminology #1**

*Below each of the following words are choices.*

*Circle the choices that are examples of each of those words*

1. Dominant allele 4. Diploid

D e k L S Yy N RR f Gh GgHH

2. Recessive allele 5. Homozygous dominant

M n d F P AA Gg KK uu Rr

3. Haploid 6. Homozygous recessive

D Dd CC a aD Eeff ee Ff HH Oo qq

Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Genetic Terminology #2**

*Below each of the following words are choices. Circle the choices that are examples of each of those words.*

1. Genotype

Bb black rr long yellow FF Yy crooked

1. Phenotype

blue HH seedless Ss hairy striped ww

1. Genotypes in which dominant gene must show

AA Dd EE ff Jj RR Ss

1. Genotypes in which dominant gene must show

AA Dd EE ff Jj RR Ss

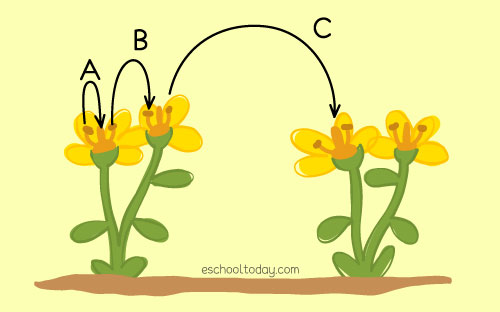
1. Genotypes in which recessive gene must show

Aa Gg Ff KK rr Oo Tt



Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Pollination**



1. Which letter(s) refer to self-pollination? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Which letter(s) refer to cross-pollination? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Differentiate between a plant that is true-breeding (purebred) and a hybrid. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

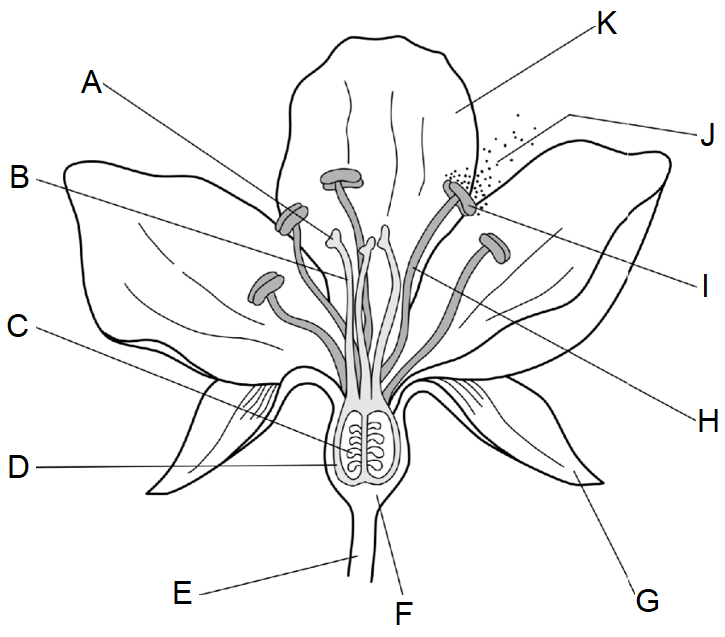
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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Flower Structures**



1. Which structures make up the **stamens** (male parts)? \_\_\_\_\_\_\_\_\_\_\_\_

\_\_

1. Which structures make up the **carpel** (female parts)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which parts are neither female nor male? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Inheritance of Traits**



1. Label the F1, P, and F2 generations on the

right of the image.

2. What is the dominant trait for height of these

Pea plants? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

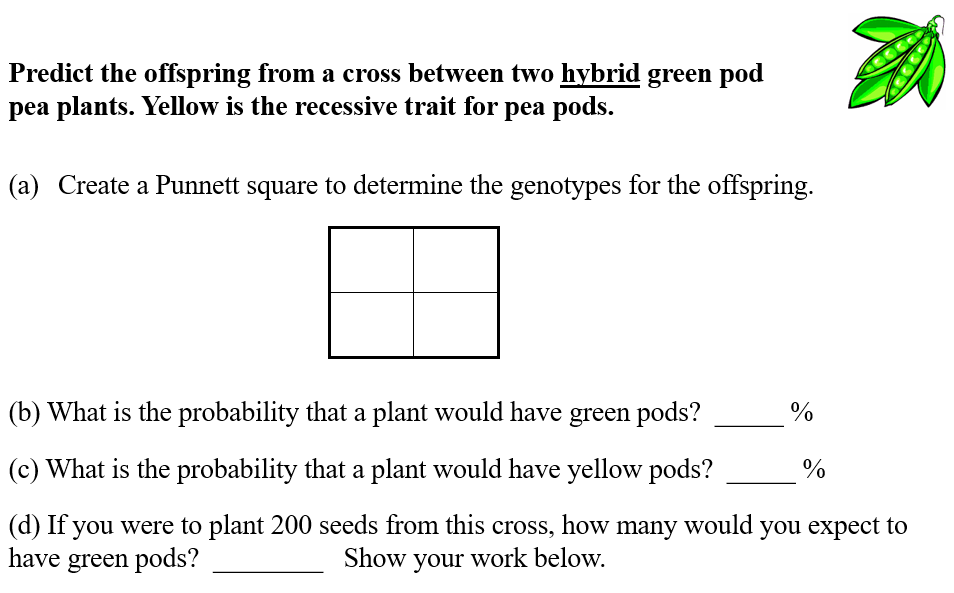
3. What would be the **genotype** of the “all tall”

plants in the 2nd generation assuming

their parents were true breeding. \_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Punnett Squares**

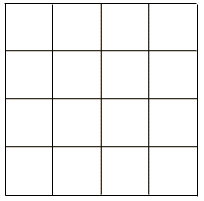


Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Dihybrid squares**

A. A watermelon is hybrid for both dominant traits green and short. It is crossed with a watermelon that is recessive for both traits and is striped and long. Complete the Punnett Square for this cross then answer the question below the square.

Parent 1 genotype: \_\_\_\_\_\_\_\_\_ Parent 2 genotype: \_\_\_\_\_\_\_\_\_\_\_\_



B. The grocery store has ordered only long, striped watermelons to sell. If the farmer gathered 320 seeds from this cross and planted them, how many long, striped watermelons will he be able to sell to the grocery store? Show your work. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Related image

Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Chi Square**

In peas, smooth seeds (R) are dominant over wrinkled seeds (r). In the P generation, a plant homozygous for smooth seeds is crossed with a plant with wrinkled seeds. The resulting F1 plants are crossed. The seeds of the observed F2 generation were 5474 smooth seeds and 1850 wrinkled seeds. Does the data fit the predicted phenotypic ratio?

A. Use 2 Punnett squares to represent the crosses.

B. What is the predicted phenotypic ratio in the F2 generation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C. Complete the data table and calculate the Chi-square value.

|  |  |  |  |
| --- | --- | --- | --- |
| **Phenotype** | **Expected Number** | **Observed Number** | **(O – E)2 ÷ E** |
|  |  |  |  |
|  |  |  |  |
|  |  | *X*2 value | |

\* Use the probability chart for the p-value and degrees of freedom from your M&Ms lab to answer D-F.

D. What are the degrees of freedom for this experiment? \_\_\_\_\_\_\_\_\_\_

E. Do you accept or reject the null hypothesis at 0.05 probability? \_\_\_\_\_\_\_\_\_

F. Does the data fit the predicted phenotypic ratio? \_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_

**Concept Covered: Testcross**

In pea plants, purple flowers (P) is dominant over white flowers (p). When we look at a purple flower, there is no way of knowing its genotype. We don’t know the flower’s parents, but we can cross pollinate it and look at the genotypes of the offspring.

1. What are the 2 possibilities for the purple flower’s genotype? \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_

2. Why are we always sure about the genotype of a white flowered pea plant?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Perform the Punnett squares for the following testcrosses: PP x pp and Pp x pp

\*Note, we don’t “testcross” humans, but we can determine the genotype of a parent using the same methodology. A 50-year old man had his gallbladder removed, and the doctor noted that he had a condition called *situs inversus*, where all of his digestive organs are on the opposite side of the body than is expected. His wife does not have *situs inversus*. One of their 4 children was discovered to also have *situs inversus* when he had an attack of appendicitis. What is the mother’s genotype? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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