CG Classical Genetics at a Glance (approximately 12-14 traditional class days):

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| Seg | Model Move | Est Time  (min) | Overview | Resources | What did we figure out? |
| 1 | **P->Q** | 15 | We observe the variations of several human traits, realize that trait expression is not so simple as receiving ½ from each parent so we then ask: How do the instructions we get from our parents work together to make us to look the way we do? | * 01 CG Doodle Sheet * 01 Left and Right Cards | We observed variations of several human traits. We know that we receive ½ of our information from our mother and ½ from our father but we are still wondering, how does the DNA from 2 parents work together to make us to look the way we do? |
| 2 | **Q🡪M** | 10 | We asked: How does the DNA from 2 parents work together to determine an offspring’s traits? | * 01 CG Doodle Sheet | We have several initial ideas about how the DNA from 2 parents come together and make us look the way we do. |
| 3 | **M🡪P** | 130 | Now we have an initial set of ideas to explain how traits are expressed, but before we explore those ideas we look at more phenomena from 5 family pedigrees. | * 01 CG Doodle Sheet * 03 Practice Pedigree Instructions * 03 Practice Pedigree Handout * 03 Family Histories for 5 families | We have made and analyzed pedigrees and have seen 5 different patterns of inheritance in 5 different families |
| 4 | **P🡪M** | 55 | Next, we look Mendel’s data to see if it will help us explain the patterns we saw in the 5 families. | * 01 CG Doodle Sheet | We have added to our model: When there are 2 different versions for a trait and when one version is dominant over the other, the dominant version of the trait is expressed. We also figured out Mendel’s 3:1 ratio. |
| 5 | **M🡪P** | 55 | We now use our model to explain how the trait of albinism is inherited in the Kendrick family. Once we have a better understanding of how our model works to explain the phenomenon, we introduce science terminology. | * 01 CG Doodle Sheet * 05 Kendrick Family Handout | We have successfully used our model to explain how the grandma and the grandson are the only family members with albinism. We have also added science terminology to our model statements. |
| 6 | **M** | 15 | In this learning segment we read about Mendel and his laws from a Biology Text or other sourced reading on Mendel. We use a reading guide to help us look for connections between Mendel’s ideas and our own. | * 01 CG Doodle Sheet * 06 Mendel Reading Guide * Classroom Biology Textbook or other sourced reading on Mendel’s Laws * 06 Pocket Mendel | We figured out that out model ideas are very similar to Mendel’s ideas. |
| 7 | **M->P** | 55 | We now use our model to make sense of simple dominance in the fictitious Dragonbug. With the help of a VGL simulation and a set of MBER problem sets we breed several generations of Dragonbugs to help us determine which trait variation is dominant. We keep track of our observations, findings and explanations in our field notebook. | * VGL Website * 07 VGL program files * 07 VGL MBER Problem Set I * 06 Pocket Mendel * 07 Dragonbug Field Notebook Handout * 07 Simple Dominance Formative Assessment | We can use our model and data from several crosses of Dragonbugs to determine which variation of a trait is dominant. |
| 8 | **M->P** | 55 | We return to our pedigrees to see if we can use our model to explain the pattern of inheritance for each family. For the pattern that we can explain we assign alleles and then genotypes to make sense of who has the trait variation and why. For those patterns that we can’t explain, we think about how we could extend our model. | * 06 Pocket Mendel * Family Pedigree Posters | We figured out that we can only explain what is happening with the Summers family. Our simple dominance model does not explain what is happening with the other 3 families. |
| 9 | **M->Q** | 25 | We take the role of a genetic counselor and write a formal letter to the Summers family explaining why their daughter has PKU, but neither parent not her brother is affected. | * 09 Letter to Summers Family Handout | Students have written a letter to the Summers Family which entails a complete explanation of how Jane has PKU when neither her parents nor her brother has the disease. We have used our model statements to support our claims. We may have also practiced how to write a formal letter. |
| 10 | **M->P** | 55-180 | We return to the Marcus, McCann, and Medeiros family pedigrees. We work with data form the VGL simulator and MBER Problem set II, to figure out similar patterns in the Dragonbugs and then apply those ideas to the family patterns. We extend our model beyond simple dominance. | * Family Pedigree Posters * VGL Website * 10 VGL MBER Problem Set II * 10 Pocket Mendel extensions * Dragonbug Field Notebook | We figured out that simple dominance is not the only explanation for patterns of inheritance. The ideas of co-dominance, multiple alleles, and sex-linked traits can be used to explain other patterns of inheritance |
| 11 | **M->P** | 25 | Finally, we write a letter to Gregor Mendel explaining how we have extended the model of simple dominance to help explain other inheritance patterns | * 11 Letter to Mendel Assessment | Students have written a letter to Mendel to explain how we extended his model to explain different patterns of inheritance beyond simple dominance. |