This unit spans approximately 20 class periods of 40 minutes each.  The unit is divided into 8 lessons:  The first six lessons focus on Mendelian genetics; the last two lessons touch on molecular genetics.

Previously, students had learned in the Organelles Unit that the function of the nucleus is to house the genetic instructions to build proteins; the last two lessons build on this knowledge.

At the start of the unit, students begin by developing an understanding of inherited and non-inherited traits.  Then they develop their initial models, prior to seeing any evidence to explain how traits are inherited.  After learning to use pedigrees as evidence, they rule out some of the most common models developed by class members, arriving at an intermediate model that will be revised later--this is the “strong gene” model that says that children inherit traits from the parent with the “stronger gene.”  As the students work with additional sets of evidence presented again as family pedigrees, they develop new models, with most classes developing normative Mendelian models on their own through a series of carefully scaffolded activities.  Students then learn the formal method of Punnett Squares; now that they have developed a deep appreciation for the need for a model of inheritance that involves two genetics from each parent, they can readily make sense of Punnett Squares.

The last two lessons integrate students new understanding of Mendelian genetics with their understanding of the function of the nucleus is to house the genetic instructions to build proteins.  In the first of these lessons, students use evidence to work out whether there are some humans who are genetically resistant to HIV.  In the second lesson, once they have concluded in the previous lesson that some humans are indeed genetically resistant, they use evidence to decide which of two different models better explains the genetic mechanism by which these individuals are resistant. In these lessons, students solidify their understanding of basic ideas of molecular genetics and also gain experience in complex scientific practices of model selection, argumentation, evidence evaluation, and coordinating models with evidence.

NOTE: The genetic unit has as a prerequisite one (not all) of the lessons in the Organelles unit: the lesson on the nucleus.

Here are the materials for this unit:

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| **Lesson** | **Days** | **Materials** |
| 1- What are heritable traits | 1 Day | **Student Packet** - PRACCIS Genetics Lesson 1 What are heritable traits Student Packet  **Teacher Guide** - PRACCIS Genetics Lesson 1 What are heritable traits Teacher Packet |
| 2- Testing Student Models of Inheritance | 2 Days | **Student Packet** - PRACCIS Genetics Lesson 2 Testing inheritance models Student Packet  **Teacher Guide** - PRACCIS Genetics Lesson 2 Testing inheritance models Teacher Packet  **PowerPoint Class Slides** - PRACCIS Genetics Lesson 2 Testing inheritance models Class |
| 3- Strong Gene Model | 3 Days | **Student Packets** - PRACCIS Genetics Lesson 3 Evidence 1 Student Packet  - PRACCIS Genetics Lesson 3 Evidence 2 Student Packet  - PRACCIS Genetics Lesson 3 Evidence 3 Student Packet  **Teacher Guide** - PRACCIS Genetics Lesson 3 Teacher Packet  **PowerPoint Student Slides** - PRACCIS Genetics Lesson 3 Introduction to Pedigrees |
| 4- Terminology and Labs | 4 Days | **Student Packets** - PRACCIS Genetics Lesson 4 - Day 1 Terminology Homework Student Packet  - PRACCIS Genetics Lesson 4 - Day 2 & 3 Chromosomes Lab Worksheets Student Packet  - PRACCIS Genetics Lesson 4 - Day 4\* Strawberry DNA Extraction Student Packet  **Teacher Guides** - PRACCIS Genetics Lesson 4 - Terminology and Labs Teacher Packet  - PRACCIS Genetics Lesson 4 - Day 1 Terminology Answer Key Teacher Packet  **PowerPoint Class Slides** - PRACCIS Genetics Lesson 4 - Day 1 Terminology Class  - PRACCIS Genetics Lesson 4 - Day 2 & 3 Chromosome Lab Instructions Class  - PRACCIS Genetics Lesson 4 - Day 4\* Strawberry Lab Do Now and Closure Class |
| 5- Punnett Squares | 3 Days | **Student Packets** - PRACCIS Genetics Lesson 5 - Day 1 Terms and Line Diagrams Student Packet  - PRACCIS Genetics Lesson 5 - Day 2 & 3 Punnett Square Class Packet Student Packet  - PRACCIS Genetics Lesson 5 - Day 2 & 3 Punnett Square Practice Part 2 Student Packet  **Teacher Guide** - PRACCIS Genetics lesson 5 - Terms Diagrams and Punnett Squares Teacher Packet  **PowerPoint Class Slides** - PRACCIS Genetics Lesson 5 - Day 1 Terms Concept Lesson Class  - PRACCIS Genetics Lesson 5 - Day 2 & 3 Punnett Squares Introduction Class |
| 6- Genetics Jeopardy | 1 Day | **Teacher Guide** - PRACCIS Genetics Lesson 6 - Genetics jeopardy - Teacher Packet  **PowerPoint Class Slides** - PRACCIS Genetics Lesson 6 - Genetics jeopardy - Class |
| 7- Existence of HIV Resistance | 3 Days | **Student Packet** - PRACCIS Genetics Lesson 7 HIV Resistance Existance Student Packet  **Teacher Guide** - PRACCIS Genetics Lesson 7 HIV Teacher Packet  - PRACCIS Genetics Lesson 7 ARGUMENTATION ACTIVITY TEACHER'S NOTES  - PRACCIS Genetics Lesson 7 Writing Rubric  **PowerPoint Class Slides** - PRACCIS Genetics Lesson 7 HIV Introduction Class  **Supplementary Handouts** - PRACCIS Genetics Lesson 7 Argumentation Activity Part 1 SHORTENED  - PRACCIS Genetics Lesson 7 Argumentation Activity Part 2 |
| 8- Mechanism of HIV Resistance | 3 Days | **Student Packets** - PRACCIS Genetics Lesson 8 HIV Mechanism Models Student Packet  - PRACCIS Genetics Lesson 8 HIV Mechanism Student Packet  **Teacher Guides** - PRACCIS Genetics Lesson 8 HIV Mechanism Teacher Packet  - PRACCIS Genetics Lesson 8 Writing Rubric  **PowerPoint Class Slides** - PRACCIS Genetics Lesson 8 Evidence 1 Burke Family  - PRACCIS Genetics Lesson 8 Evidence 2 Protein Comparison  - PRACCIS Genetics Lesson 8 Evidence 3 Interferon BlogSim  - PRACCIS Genetics Lesson 8 Evidence 4 Receptor Comparison  - PRACCIS Genetics Lesson 8 HIV Mechanism Models Class |

\*requires preparation in advance