**Topic Review Guide**: Mendelian Genetics (5.3)

**To Think About**: How do conserved processes support the concept of common ancestry? Why are these processes considered fundamental for continuity of life? What is Mendel’s law of segregation and law of independent assortment? What are monohybrid and dihybrid crosses? How can the laws of probability be applied to genetic crosses? What is a pedigree and how do the patterns show types of inheritance? Why do scientists use hypothesis testing? What is the purpose of a chi-square goodness of fit test? What steps are necessary to perform chi-square goodness of fit tests?

**Watch:** AP Daily Video 5.3 “Mendelian Genetics” Video [1](https://apclassroom.collegeboard.org/d/gwt0tuft36?sui=6,5), [2](https://apclassroom.collegeboard.org/d/fu9u6qnati?sui=6,5), [3](https://apclassroom.collegeboard.org/d/il1bxoslyn?sui=6,5) (Video 3 is optional)

**Read:** Chapter 11, Biology in Focus, 1st edition.

**Supplementary Resources**: Click the links below for more information to help you learn more about this lesson.

* Guided Notes 5.3 ([Video 1](https://docs.google.com/document/d/1RVLwDl5z7EVveYYyGvJZKpo5ci8A2r4IQwB0Sg6FTio/edit?usp=sharing), [Video 2](https://docs.google.com/document/d/1fR4pKtGbESttS5HbO5kd-CApPi7I7X7A8wloRXe1ilk/edit?usp=sharing), [Video 3](https://docs.google.com/document/d/1fg3Q9frQBkKG0-IwP_oYdpMtKI97PAa6QMQwqPVNhH8/edit?usp=sharing))
* [Slideshow Presentation](https://docs.google.com/presentation/d/17bmgSoWtyoybjHVb1N2DFJYb_TJ-kltwaXk1XXsOOec/edit?usp=sharing)
* Bozeman Science: [Mendelian Genetics](http://www.bozemanscience.com/029-mendelian-genetics)
* Crash Course Biology: [Heredity](http://http/www.youtube.com/watch?v=CBezq1fFUEA)
* Hillis et al.: [Independent Assortment of Alleles Animation](http://bcs.whfreeman.com/hillis1e/#667501__674141__)
* Hillis et al.: [Test Cross](http://bcs.whfreeman.com/hillis1e/#667501__708812__)
* DNA From The Beginning: [Classical Genetics Tutorials and Animations](http://dnaftb.org/#classical)
* University of Arizona Biology Project: [Mendelian Genetics Monohybrid Problem Set](http://www.biology.arizona.edu/mendelian_genetics/problem_sets/monohybrid_cross/monohybrid_cross.html)
* University of Arizona Biology Project: [Mendelian Genetics Dihybrid Problem Set](http://www.biology.arizona.edu/mendelian_genetics/problem_sets/dihybrid_cross/dihybrid_cross.html)
* University of Arizona Biology Project: [Sex-Linked Problem Set](http://www.biology.arizona.edu/mendelian_genetics/problem_sets/sex_linked_inheritance/sex_linked_inheritance.html)
* Biocoach: [Mendelian Genetics](http://www.phschool.com/science/biology_place/biocoach/inheritance/intro.html)

**Recall and Review:** Use the lecture in the video and your textbook to help you answer these questions in your BILL. Before you start, mark your level of understanding. After you have completed the questions, then check to see what level of understanding you have achieved. If you’re still at a level N or level A, it is recommended that you stop in for office hours.

| **Essential Knowledge:**  What You Absolutely Must Know and Understand | | | | |
| --- | --- | --- | --- | --- |
| Levels of Mastery | | | | *I can explain how shared, conserved, fundamental processes and features support the concept of common ancestry for all organisms. (Topic 5.3)* |
| **N** | **A** | **E** | **M** | **Questions You Should Be Able to Answer** |
|  |  |  |  | 1. **Describe** the major features of the genetic code are shared by all modern living systems. |
|  |  |  |  | 1. **Explain** why cellular respiration is considered support for common ancestry for all organisms. |
| **Essential Knowledge:**  What You Absolutely Must Know and Understand | | | | |
| Levels of Mastery | | | | *I can explain the inheritance of genes and traits as described by Mendel’s laws. (Topic 5.3)* |
| **N** | **A** | **E** | **M** | **Questions You Should Be Able to Answer** |
|  |  |  |  | 1. **Explain** how a monohybrid cross demonstrates that segregation of alleles takes place during meiosis. |
|  |  |  |  | 1. **Explain** how a dihybrid cross demonstrates that independent assortment of chromosomes occurs during metaphase I of meiosis. |
|  |  |  |  | 1. **Describe** how a pedigree can be a model used to predict patterns of inheritance. |

| Learn More: For more information about inheritance of traits and production of gametes, follow the links below:   * [The Blue People of Troublesome Creek](http://www.indiana.edu/~oso/lessons/Blues/TheBlues.htm): interesting story about a family from Kentucky with methemoglobinemia * [Queen Victoria and Hemophilia](http://www.ualberta.ca/~pletendr/tm-modules/genetics/70gen-hemophil.html): Trace the passage of hemophilia through the royal families of Europe * [PBS’ The Evolution of Sex](http://www.pbs.org/wgbh/evolution/sex/advantage/index.html): learn why sexual reproduction is advantageous from an evolutionary standpoint |
| --- |