

Teacher: J. Haut
Class: AP Biology
Period: 3
Assignments: Week 4 & 5

The Week 4 assignments in this packet are due 5/15/2020. If working online, you may turn in work digitally before the deadline. I encourage you to turn work in as you complete it. I have broken the work down into daily tasks to help you manage your time. Week 5 assignment is to prepare for your other AP exams. Good luck!

My office hours are 10AM-12PM, M-F. You can email me at jhaut@tusd.net, post a question in Teams, or call me at (209) 625-9540 with questions. Please continue to check your email and Teams Classroom regularly. College Board will be reaching out to you via email!!

Wk4/Day 1: Unit 5 Heredity Review: Meiosis & Genetic Diversity

Unit 5 encompasses a lot of material. From meiosis, to Mendelian and Non-Mendelian genetics, to chromosomal inheritance, there are many topics covered. The use of probability for both Mendelian and Non-Mendelian genetics is an important understanding, and this concept can be applied to chi-square analysis.

- Review Meiosis**—you choose method to review from below
 - Review Ch. 13 in your textbook-take notes as needed
 - Khan Academy Review of Meiosis and Genetic Diversity
<https://www.khanacademy.org/science/ap-biology/heredity/meiosis-and-genetic-diversity/v/fertilization-haploid-diploid-gamete-zygote-homologous>
 - Work through videos, resources, and practice questions
 - Take notes as needed
 - College Board AP Review Videos: AP Biology: Meiosis, Meiosis & Genetic Diversity
<https://www.youtube.com/watch?v=iKkijneOUhk&list=PLoGqvigg4847VchRdUdvbDPzsp9ResrjD&index=21>
 - Watch and take notes as needed.
 - Pay close attention to the Guided Practice for FRQs at the end of each video.
- By the end of this review lesson you should be able to answer the following questions.
 - Explain how meiosis results in the transmission of chromosomes from one generation to the next.
 - Describe similarities and/differences between the phases and outcomes of mitosis and meiosis.
 - Explain how the process of meiosis generates genetic diversity.
- Free Response Question (due 5/15/20):** Go to Assignments in TEAMS and complete the Assignment called **Wk4/Day1 FRQ** and submit in Teams.
- Optional: Take the Personal Progress Checks for Unit 5 in AP Classroom.

Wk4/Day 2: Unit 5 Heredity Review: Mendelian Genetics

- Review Mendelian Genetics**—you choose method to review from below
 - Review Ch. 15 in your textbook-take notes as needed
 - Khan Academy Review <https://www.khanacademy.org/science/ap-biology/heredity/mendelian-genetics-ap/v/introduction-to-heredity>
<https://www.khanacademy.org/science/ap-biology/heredity/mendelian-genetics-ap/v/introduction-to-heredity>
 - Work through videos, resources, and practice questions
 - Take notes as needed
 - College Board AP Review Video: AP Biology: Mendelian Genetics
<https://www.youtube.com/watch?v=SKsmJ6PxOcY&list=PLoGqvigg4847VchRdUdvbDPzsp9ResrjD&index=22>

UNIT 5 Heredity	
~9-11	Class Periods
8-11%	AP Exam Weighting
IST 1	5.1 Meiosis
IST 3	5.2 Meiosis and Genetic Diversity
EVO IST 6 5	5.3 Mendelian Genetics
IST 5	5.4 Non-Mendelian Genetics
SYI 1	5.5 Environmental Effects on Phenotype
SYI 6	5.6 Chromosomal Inheritance

- Watch and take notes as needed
 - Pay close attention to the Guided Practice for FRQs at the end of each video
 - Pay close attention to the practice with Chi-Square
2. By the end of this review lesson you should be able to answer the following questions.
 - Explain how shared, conserved, fundamental processes and features support the concept of common ancestry for all organisms.
 - Explain the inheritance of genes and traits as described by Mendel's laws.
 - Work out Punnett squares for mono- and di-hybrid crosses.
 3. **Free Response Question (due 5/15/20):** Go to Assignments in the AP Classroom and complete the Assignment called **Wk4/Day2 FRQ** and submit in AP Classroom.
 4. Optional: Take the Personal Progress Checks for Unit 5 in AP Classroom.

Wk4/Day 3: Unit 5 Heredity Review: Non-Mendelian Genetics

1. **Review Non-Mendelian Genetics**—you choose method to review from below
 - Review Ch. 15 in your textbook—take notes as needed
 - Khan Academy Review 2 Sections
 - Environmental Effects on Phenotype <https://www.khanacademy.org/science/ap-biology/heredity/environmental-effects-on-phenotype/v/phenotype-plasticity>
 - Chromosomal Inheritance <https://www.khanacademy.org/science/ap-biology/heredity/chromosomal-inheritance-ap/v/boveri-sutton-chromosome-theory>
 - Work through videos, resources, and practice questions
 - Take notes as needed
 - **College Board AP Review Video:** AP Biology: Non-Mendelian Genetics
<https://www.youtube.com/watch?v=X6uwX0dDNNw&list=PLoGgviqq4847VchRdUdvbDPzsp9ResrjD&index=24>
 - Watch and take notes as needed
 - Pay close attention to the Guided Practice for FRQs at the end of each video
2. By the end of this review lesson you should be able to answer the following questions.
 - Explain how the same genotype can result in multiple phenotypes under different conditions.
 - Explain how chromosomal inheritance generates genetic variation in sexual reproduction.
3. **Free Response Question (due 5/15/20):** Go to Assignments in the AP Classroom and complete the Assignment called **Wk4/Day3 FRQ** and submit in AP Classroom.
4. Optional: Take the Personal Progress Checks for Unit 5 in AP Classroom.

Wk4/Day 4: Unit 6 Gene Expression & Regulation: DNA, protein synthesis, and gene expression

UNIT 6 Gene Expression and Regulation	
~18-21	Class Periods
12-16%	AP Exam Weight
IST 1	6.1 DNA and RNA Structure
IST 2	6.2 Replication
IST 2	6.3 Transcription and RNA Processing
IST 2	6.4 Translation
IST 6	6.5 Regulation of Gene Expression
IST 6	6.6 Gene Expression and Cell Specialization
IST 2	6.7 Mutations
IST 6	6.8 Biotechnology

This unit describes how a gene becomes a protein and the regulations that are in place for these processes. Transcription and translation are both discussed in detail. The regulation of genes is essential to the conservation of energy in all organisms, and the process can be quite complex. Lastly, mutations and biotechnology are discussed. This content should be fresh in your mind as it is the most recent content we covered before the pandemic.

1. **Review The Molecular Basis of Inheritance**—you choose method to review from below
 - Review Ch. 16-18 in your textbook—take notes as needed
 - Khan Academy Review <https://www.khanacademy.org/science/ap-biology/gene-expression-and-regulation> (first 6 topic boxes/sections)
 - Work through videos, resources, and practice questions
 - Take notes as needed
 - College Board AP Review 3 Videos:
 - DNA Structure
<https://www.youtube.com/watch?v=kgggP0Ygjom&list=PLoGgviqq4847VchRdUdvbDPzsp9ResrjD&index=25>
 - Protein Synthesis
<https://www.youtube.com/watch?v=IYdR7KYFVQU&list=PLoGgviqq4847VchRdUdvbDPzsp9ResrjD&index=26>
 - Gene Regulation
<https://www.youtube.com/watch?v=j0DCJUNdLNU&list=PLoGgviqq4847VchRdUdvbDPzsp9ResrjD&index=27>
 - Watch and take notes as needed
 - Pay close attention to the Guided Practice for FRQs at the end of each video

2. By the end of this review lesson you should be able to answer the following questions.
 - Describe the structures involved in passing hereditary information from one generation to the next.
 - Describe the characteristics of DNA that allow it to be used as the hereditary material.
 - Describe the mechanisms by which genetic information is copied for transmission between generations.
 - Describe the mechanisms by which genetic information flows from DNA to RNA to protein.
 - Describe how the phenotype of an organism is determined by its genotype.
 - Describe the types of interactions that regulate gene expression.
 - Explain how the location of regulatory sequences relates to their function.
 - Explain how the binding of transcription factors to promotor regions affects the gene expression and/or the phenotype of the organism.
 - Describe the various types of mutations and explain how changes in genotype may result in changes in phenotype.
 - Explain how alterations in DNA sequences contribute to variation that can be subject to natural selection.
3. **Free Response Question (due 5/15/20):** Go to Assignments in TEAMS and complete the Assignment called **Wk4/Day4 FRQ** and submit in Teams.
4. Optional: Take the Personal Progress Checks for Unit 6 in AP Classroom.

Wk4/Day 5 Unit 6 Gene Expression & Regulation: Biotechnology

1. **Review Biotechnology**—you choose method to review from below
 - Review Ch. 20 in your textbook—take notes as needed
 - Khan Academy Review <https://www.khanacademy.org/science/ap-biology/gene-expression-and-regulation/biotechnology/v/introduction-to-genetic-engineering>
 - Work through videos, resources, and practice questions
 - Take notes as needed
 - **College Board AP Review Video:** AP Biology: Biotechnology
https://www.youtube.com/watch?v=pgoyxfZ_EH4&list=PLoGgviqq4847VchRdUdvbDPzsp9ResrjD&index=28
 - Watch and take notes as needed
 - Pay close attention to the Guided Practice for FRQs at the end of each video
2. By the end of this review lesson you should be able to answer the following questions.
 - Explain the use of genetic engineering techniques in analyzing or manipulating DNA.
3. **Free Response Question (due 5/15/20):** Go to Assignments in TEAMS and complete the Assignment called **Wk4/Day5 FRQ** and submit in Teams.
4. Optional: Take the Personal Progress Checks for Unit 6 in AP Classroom.

Additional Review Recommendation to prepare for AP Exam on Monday, April 18th, at 11 am:

- Quantitative Skills in AP Biology (i.e. the math stuff):
<https://www.youtube.com/watch?v=8p3WvbKMKvA>
- Box and Whisker Plots—you could be presented with one on the test. Watch Kahn Academy,
<https://www.youtube.com/watch?v=09Cx7xulXig>.
 - When is a box and whisker plot used?
 - What info is provided with a box and whisker plot? What do the whiskers tell you?
 - How is this different from a bar graph with SEM bars?
- Review Standard Deviation and Error Bars:
 - Paul Andersen—Standard Error: <http://www.bozemanscience.com/standard-error>
 - Standard Deviation and Standard Error of the Mean:
<https://www.youtube.com/watch?v=3UPYpOLeRJg>
 - Helps with interpretation of graphs with ± 2 SEM! (start at 6:26) ← **Definitely check this out!!**