Name: _____ Start Date: ___/___/___

Unit 7: Genetics & the Central Dogma

Standards: 2.1a, 2.1b, 2.1f, 2.1g, 2.1h, 2.1i

Common Core Learning Standards: RST 9.1, RST 9.2, RST 9.3, RST 9.4, RST 9.5, RST 9.6, RST 9.7, WHST 9.1, 9.2, 9.4, 9.6,9.8, 9.9

Unit Big Ideas:
1. How does biological information pass from one generation on another?
2. What is the structure of DNA, and how does it function in genetic inheritance?
3. How does information flow from DNA to RNA to direct the synthesis of proteins?

*****Links to all web activities are available at www.bellino.weebly.com*****

Layer C – Basic Understanding (650 PTS)

- You must earn 650 points to complete Layer C and move on to Layer B
- You can earn the remaining points you need in each category using any combination of assignments including lecture notes, videos, textbook reading, graphic organizers, handouts, and internet activities
- All assignments will be graded based on an **ORAL QUIZ**.
- Depending on the assignment you will be graded on both the assignment and/or *an oral or reflection quiz*
- Any work that is not completed in class can be completed at home for homework.

Objectives: *By the end of this unit, I should be able to:*

1. Describe the overall structure of the DNA molecule as a double helix of the four nucleotides (A, T, C, G) and a sugar-phosphate backbone. (2.1f)
2. Explain the Central Dogma and the relationship between DNA, RNA, genes, and proteins. (2.1g)
3. Summarize the events of DNA replication, transcription, and translation, as well as the roles of enzymes and ribosomes in the process. (2.1b, 2.1i)
4. Explain how gene expression can be modified by interactions with the environment. (2.1a)
5. Analyze how mutations (changes in the genetic code) affect protein structure and therefore, physical traits. (2.1h)

1. MINI-LESSON – FLIP CLASSROOM: **You will watch the videos and look through the PowerPoint presentations the night before class, take notes and be prepared with questions and to participate in discussions. (CCLS RST.9.1, CCLS RST.9.2, CCLS RST.9.6)** **50pts each**

- Mini-Lesson 1: DNA Structure DATE_____ POINTS_____
- Mini-Lesson 2: Transcription: DNA→RNA DATE_____ POINTS_____
- Mini-Lesson 3: Translation: RNA→Protein DATE_____ POINTS_____
- Mini-Lesson 4: Gene Expression and Mutation DATE_____ POINTS_____

OBJECTIVE 1: DNA STRUCTURE

_____ ***2. ANLYZING DNA DATA*** **50 pts**

Complete the "Analyzing Data" activity on page 345. Redraw the data and the questions (CCLS RST.9.7)

_____ ***3. GIST SECTION 12.2: THE STRUCUTRE OF DNA (pp.344-348)*** **50 pts**

Read and GIST section 12.2. (CCLS RST.9.1)

_____ ***4. BRAINPOP: DNA*** **25 pts**

Go to www.brainpop.com and login (Username: **environhs** Password: **brainpop**). Watch the "DNA" video and take the **CLASSIC QUIZ**. E-mail the results (msbellinohses@gmail.com). (CCLS RST.9.5)

_____ ***5. CASTLE LEARNING: DNA STRUCTURE REGENTS QUESTIONS*** **50 pts**

Go to www.castlelearning.com and login. Complete the assignment titled "U7.OB1.DNA STRUCTURE". Fill out the Castle Learning Reflection to get credit. (CCLS RST.9.4, CCLS RST.9.5)

OBJECTIVE 2: TRANSCRIPTION: DNA→RNA

6. MINI-POSTER: THE CENTRAL DOGMA OF BIOLOGY **50 pts**

Design a poster that models the Central Dogma of Biology and diagrams how information from DNA is used to create proteins for the cell. Use figures from the textbook and other websites. Be sure to use the following vocabulary: DNA, RNA, Transcription, Translation, Replication, Single-stranded, Double-stranded, Ribosome, Codon, Protein, Amino Acids, and Nucleus. (CCLS RST.9.4, CCLS RST.9.5)

7. GIST SECTION 13.1: RNA (pp.362-365) **50 pts**

Read and GIST section 13.1. (CCLS RST.9.1)

8. BRAINPOP: RNA **25 pts**

Go to www.brainpop.com and login (Username: **environhs** Password: **brainpop**). Watch the "RNA" video and take the **CLASSIC QUIZ**. E-mail the results (msbellinohses@gmail.com). (CCLS RST.9.5)

9. CASTLE LEARNING: TRANSCRIPTION REGENTS QUESTIONS **50 pts**

Go to www.castlelearning.com and login. Complete the assignment titled "U7.OB2.TRANSCRIPTION". Fill out the Castle Learning Reflection to get credit. (CCLS RST.9.4, CCLS RST.9.5)

OBJECTIVE 3: TRANSLATION/PROTEIN SYNTHESIS: RNA→ PROTEIN

10. QUICK LAB: HOW DOES A CELL INTERPRET CODONS? PAGE 367 **50 pts**

Complete the Quick Lab on Page 367. Answer all the questions. (CCLS RST.9.7)

11. GIST SECTION 13.2: RIBOSOMES AND PROETIN SYNTHESIS (pp.366-371) **50 pts**

Read and GIST section 13.2. (CCLS RST.9.1)

12. 13.2: ASSESSMENT QUESTIONS (pp.371) **50 pts**

Read and GIST section 13.2. (CCLS RST.9.1)

13. CASTLE LEARNING: TRANSLATION REGENTS QUESTIONS **50 pts**

Go to www.castlelearning.com and login. Complete the assignment titled "U7.OB3.TRANSLATION". Fill out the Castle Learning Reflection to get credit. (CCLS RST.9.4, CCLS RST.9.5)

OBJECTIVE 4: GENE EXPRESSION AND MUTATIONS

14. GENE EXPRESSION WORKSHEET **50 pts**

Read through the scenarios on the worksheet and identify the sources of variation in each. (CCLS RST.9.7)

15. GENE MUTATIONS & PROTEINS **50 pts**

Use a codon table to complete the worksheet on mutations. Make sure you understand the difference between the different types of mutations discussed. (CCLS RST.9.7)

16. GIST SECTION 13.3: MUTATIONS (pp.372-376) **50 pts**

Read and GIST section 13.3. (CCLS RST.9.1)

17. BRAINPOP: GENETIC MUTATIONS **50 pts**

Go to www.brainpop.com and login (Username: **environhs** Password: **brainpop**). Watch the "Genetic Mutations" video and take the **CLASSIC QUIZ**. E-mail the results (msbellinohses@gmail.com). (CCLS RST.9.5)

18. CASTLE LEARNING: GENE EXPRESSION AND MUTATIONS REGENTS QUESTIONS **50 pts**

Go to www.castlelearning.com and login. Complete the assignment titled "U7.OB4.GENE EXPRESSION AND MUTATION". Fill out the Castle Learning Reflection to get credit. (CCLS RST.9.4, CCLS RST.9.5)

VOCABULARY ASSIGNMENTS (100 PTS MAX)

Nucleotide	Base Pairing	Mutation	Gene	Transfer RNA (tRNA)
Replication	Transcription	Anticodon	Messenger RNA (mRNA)	Codon
Translation	Protein Synthesis			

ACTIVITY: VOCABULARY **50 pts**

Create a crossword puzzle using graph paper with definitions or other clues (CCLS RST.9.4)

UNIT EXAM **200 pts**

Take a Unit Exam on Castle Learning (Part 1) and paper (Part 2). (CCLS RST.9.4, CCLS RST.9.5)

Layer B – Analysis & Application

- You must earn 150 points to complete Layer B and move on to Layer A
- You can earn points by completing the following assignment:

DIRTY DNA EXTRACTION **150 pts**

Extract DNA from a strawberry and make a video of what you did and how it worked.

Layer A – Evaluation & Synthesis

CURRENT EVENT **200 pts**

Find a current events article about anything we have discussed during the reproduction/meiosis unit. Read your article, complete a SOAPSTONE and article reflection.

CREATE YOUR OWN LAYER A **200 pts**

Layer A assignments are designed as open-ended, research based assignments that contribute to a deeper and more expansive understanding of how the content fits into the larger scientific and social world. Make up your own layer A assignment that does this, let me know, and get to work.

PACING CALENDAR

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
2/24 Go over unit 7 syllabus	**2/25** Mini-Lesson 1	**2/26** Mini-Lesson 2	**2/27** Mini-Lesson 3	**2/28** Mini-Lesson 4
3/3 LAYER C ACTIVITIES	**3/4** LAYER C ACTIVITIES	**3/5** LAYER C ACTIVITIES	**3/6** LAYER B ACTIVITIES	**3/7** LAYER B ACTIVITIES
3/10 LAYER A Activity	**3/11** LAYER A Activity	**3/12** LAYER A Activity	**3/13** LAYER A Activity	**3/14** UNIT 7 ALL LAYERS DUE