

Name: \_\_\_\_\_

Start Date: \_\_\_/\_\_\_/\_\_\_

# Unit 3: Cell Functions

**NY State Science Standards:** 1.2h, 4.1a, 5.1a, 5.1b, 5.1c, 5.1d, 5.1e, 5.1f, 5.1g

**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, W.9.3, WHST.9.9, WHST.9.2

**\*\*Links to all web activities are available at [www.bellino.weebly.com](http://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:** When I complete layer C, I will be able to:

1. Compare and contrast organic molecules (carbohydrates, lipids, proteins, nucleic acids) based upon building blocks, roles in the cell, sources, ways they enter the cell, and examples of each. (1.2h, 5.1c)
2. Explain the role of shape in the functioning of macromolecules including enzymes and substrates. (5.1f, 5.1g)
3. Conduct experiments to explore the actions of enzymes in different conditions, e.g. varying pH and temperature. (5.1f)
4. Describe the process of photosynthesis including reactants, products, energy transfer, location, chemical equation and purpose. (5.1a, 5.1b, 5.1c)
5. Describe the process of cellular respiration including reactants, products, energy transfer, location, chemical equation and purpose. (5.1c, 5.1d, 5.1e, 5.1f)
6. Track the movement of cell structures as cells divide during mitosis (4.1a)

**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. **50pts each**

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|---------------------------------------|------------|--------------|
| • Mini-Lesson 1: Organic Molecules    | DATE _____ | POINTS _____ |
| • Mini-Lesson 2: Enzymes              | DATE _____ | POINTS _____ |
| • Mini-Lesson 3: Photosynthesis       | DATE _____ | POINTS _____ |
| • Mini-Lesson 4: Cellular Respiration | DATE _____ | POINTS _____ |
| • Mini-Lesson 5: Mitosis              | DATE _____ | POINTS _____ |

## OBJECTIVE 1: ORGANIC MOLECULES

### **2. ORGANIC MOLECULES MINI-POSTER (PRODUCT & ORAL DEFENSE)**

**75pts**

Create a mini-poster comparing and contrasting carbohydrates, lipids, proteins, nucleic acids) based on the following characteristics: building blocks, roles in the cell, sources, ways they enter the cell, and examples. Use pages 46-49 for help. On the back of your poster, attach and answer two Regents questions about levels of organization. (CCLS RST.9.1)

### **3. ORGANIC MOLECULES WANT ADS (PRODUCT & ORAL DEFENSE)**

**75pts**

You are a cell and need organic molecules. Write 4 want ads (one for carbohydrates, lipids, proteins, nucleic acids) so that the correct molecule will apply for your job based upon building blocks, roles in the cell, sources, ways they enter the cell and examples. (CCLS RST.9.5)

### **4. ORGANIC MOLECULES PRACTICE (PRODUCT & ORAL DEFENSE)**

**50pts**

Complete the Types of Molecules and Organic Molecules worksheet. (CCLS RST.9.2)

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**5. CASTLE LEARNING: ORGANIC MOLECULES REGENTS QUESTIONS (PRODUCT & ORAL DEFENSE)****100pts**

Go to [www.castlearning.com](http://www.castlearning.com) and login. Complete the assignment titled "OBJECTIVE 1: ORGANIC MOLECULES". Complete the castle learning reflection. (CCLS RST.9.4)

**OBJECTIVE 2: ENZYMES → SHAPE DETERMINES FUNCTION**

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**6. MOLECULE SHAPE CARTOON (PRODUCT & ORAL DEFENSE)****100pts**

Draw a cartoon that illustrates the role of shape in the function of macromolecules. Your cartoon should have a minimum of 4 cells and include dialogue between the enzyme or receptor and its substrate. (CCLS RST.9.5)

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**7. ENZYME PRACTICE (PRODUCT, REFLECTION, & ORAL DEFENSE)****50pts**

Complete the Enzyme worksheets. (CCLS RST.9.2)

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**8. MOLECULE SHAPE SIMULATION (PRODUCT & ORAL DEFENSE)****50pts**

Create sets of enzymes and substrates that you can use to demonstrate different chemical reactions (synthesis and digestion). You may use paper of 3-dimensional materials. Do a demonstration of your reactions for your table, explaining the reactants, products, and enzymes in each. (CCLS RST.9.7)

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**9. CASTLE LEARNING: ENZYMES REGENTS QUESTIONS (PRODUCT & ORAL DEFENSE)****100pts**

Go to [www.castlearning.com](http://www.castlearning.com) and login. Complete the assignment titled "OBJECTIVE 2: ENZYMES". Complete the castle learning reflection. (CCLS RST.9.4)

**OBJECTIVE 3: PHOTOSYNTHESIS**

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**10. PHOTOSYNTHESIS VIDEO (PRODUCT & ORAL DEFENSE)****75pts**

Watch the Photosynthesis video at <http://www.pbslearningmedia.org/resource/tdc02.sci.life.stru.photosynth/photosynthesis/> and read the background essay. Answer the discussion questions. (CCLS RST.9.1)

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**11. PHOTOSYNTHESIS WEBQUEST (PRODUCT & ORAL DEFENSE)****75pts**

Complete the webquest (Click on Launch Interactive) at <http://www.pbs.org/wgbh/nova/nature/photosynthesis.html> and complete the handout. (CCLS RST.9.1)

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**12. PHOTOSYNTHESIS PRACTICE (PRODUCT & ORAL DEFENSE)****50pts**

Complete the Photosynthesis worksheets. (CCLS RST.9.2)

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**13. BRAINPOP: PHOTOSYNTHESIS QUIZ (PRODUCT & ORAL DEFENSE)****50pts**

Go to [www.brainpop.com](http://www.brainpop.com) and login (Username: **environhs** Password: **brainpop**). Watch the "Photosynthesis" video and take the **GRADED QUIZ**. E-mail the results ([msbellinohses@gmail.com](mailto:msbellinohses@gmail.com)). (CCLS RST.9.5)

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**14. CASTLE LEARNING: PHOTOSYNTHESIS REGENTS QUESTIONS (PRODUCT & ORAL DEFENSE)****100pts**

Go to [www.castlearning.com](http://www.castlearning.com) and login. Complete the assignment titled "OBJECTIVE 3: PHOTOSYNTHESIS". Complete the castle learning reflection. (CCLS RST.9.4)

**OBJECTIVE 4: CELLULAR RESPIRATION**

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**15. CELLULAR RESPIRATION PRACTICE (PRODUCT & ORAL DEFENSE)****50pts**

Complete the Cellular Respiration worksheets. (CCLS RST.9.2)

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**16. BRAINPOP: CELLULAR RESPIRATION QUIZ (PRODUCT & ORAL DEFENSE)****50pts**

Go to [www.brainpop.com](http://www.brainpop.com) and login (Username: **environhs** Password: **brainpop**). Watch the "Cellular Respiration" video and take the **GRADED QUIZ**. E-mail the results ([msbellinohses@gmail.com](mailto:msbellinohses@gmail.com)). (CCLS RST.9.5)

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**17. CASTLE LEARNING: CELLULAR RESPIRATION REGENTS QUESTIONS (PRODUCT & ORAL DEFENSE)****100pts**

Go to [www.castlearning.com](http://www.castlearning.com) and login. Complete the assignment titled "OBJECTIVE 4: CELLULAR RESPIRATION". Complete the castle learning reflection. (CCLS RST.9.4)

## OBJECTIVE 5: MITOSIS

### **18. MITOSIS VIDEO NARRATIVE (PRODUCT & ORAL DEFENSE)**

100pts

Watch the two videos of mitosis at <http://www.cellimagelibrary.org/images/35617> and <http://www.cellsalive.com/mitosis.htm> . Write a narrative for the video describing the major events and their role in the cell cycle. (CCLS RST.9.1, CCLS W.9.3)

### **19. MITOSIS PRACTICE (PRODUCT & ORAL DEFENSE)**

50pts

Complete the Mitosis worksheets. (CCLS RST.9.2)

### **20. MITOSIS MINI-POSTER (PRODUCT & ORAL DEFENSE)**

75pts

Create a mini-poster showing the steps of the cell cycle. Make sure to label the phases and what the structures are doing in each phases. (CCLS RST.9.4)

### **21. CASTLE LEARNING: MITOSIS REGENTS QUESTIONS (PRODUCT & ORAL DEFENSE)**

100pts

Go to [www.castlearning.com](http://www.castlearning.com) and login. Complete the assignment titled "OBJECTIVE 5: MITOSIS". Complete the castle learning reflection. (CCLS RST.9.4)

## VOCABULARY ASSIGNMENT

Carbohydrate	Lipids	Proteins	Nucleic Acids	Monomer
Polymer	Simple Sugar	Amino Acids	Fatty acids/glycerol	Nucleotides
Photosynthesis	Cellular Respiration	Glucose	ATP	Enzyme
Reactants	Products	Substrate	Mitosis	Chromosome

### **15. \*ACTIVITY: VOCABULARY (PRODUCT, REFLECTION, & ORAL DEFENSE)**

100pts

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

## Layer B – Analysis & Application (150 PTS)

### **LAB: ENZYMES**

75pts

(CCLS RST.9.3)

### **LAB: PHOTOSYNTHESIS AND CELLULAR RESPIRATION**

75pts

(CCLS RST.9.3)

## Layer A – Evaluation & Synthesis (200 PTS)

### **ANGRY RED PLANET (CCLS RST.9.1, CCLS RST.9.6, WHST.9.9)**

200pts

Complete the Angry Red Planet mystery activity on the website <http://www.accessexcellence.org/AE/mspot/arp/> . Keep a mystery log as you work to figure out what is going on. You must:

- Have a pen and notebook at your side to take notes as you go through the story.
- Organize and label your notes as you go. Use broad categories such as "possible causes", "what the graph says", "sequence of events" and so on.
- Evaluate your information. Is this a fact or an opinion?
- Be observant! The mystery has visual clues.

### **ANAEROBIC RESPIRATION AND FERMENTATION**

200pts

The cellular respiration we studies in this unit uses oxygen, making it 'aerobic respiration'. However, some organisms live in environments without much oxygen and sometimes our bodies run low on oxygen, such as when we exercise for a long time. Under these conditions, organisms get energy from food molecules through anaerobic respiration or fermentation. Research how organisms such as yeast, bacteria, or muscle cells get energy without oxygen. Write a one-page essay explaining what you learned. (CCLS RST.9.1, CCLS RST.9.2, WHST.9.2)

## PACING CALENDAR

<b>10/28</b> Go over unit 3 syllabus	<b>10/29</b> Mini-Lesson 1 Discussion LAYER C – Objective 1 Activity	<b>10/30</b> Mini-Lesson 2 Discussion Layer C – Objective 2 Activity	<b>10/31</b> Mini-Lesson 3 Discussion Layer C – Objective 3 Activity	<b>11/1</b> Mini-Lesson 4 Discussion Layer C – Objective 4 Activity
<b>11/4</b> Mini-Lesson 5 Discussion Layer C – Objective 5 Activity	<b>11/5</b> NO SCHOOL – ELECTION DAY	<b>11/6</b> LAB: ENZYMES	<b>11/7</b> Layer Activities	<b>11/8</b> Layer Activities
<b>11/11</b> NO SCHOOL – VETERANS DAY	<b>11/12</b> LAB: PHOTOSYNTHESIS & CELLULAR RESPIRATION	<b>11/13</b> LAB: PHOTOSYNTHESIS & CELLULAR RESPIRATION	<b>11/14</b> Layer Activities	<b>11/15</b> Layer Activities
<b>11/18</b> Layer Activities	<b>11/19</b> Unit 3 Exam Review	<b>11/20</b> Unit 3 Exam	<b>11/21</b> Unit 3 Exam Test Corrections	<b>11/22</b> UNIT 3 ALL LAYERS DUE