

## Science Lesson Design Sample Day 3

### Planning

<b>Name:</b>	<b>Subject Area:</b> Biology	<b>Lesson Date:</b>
<b>Unit Title:</b> Genetics - Day 3	<b>Lesson Plan Title:</b> Analyzing My Traits	<b>Grade Level:</b> 9th and 10th
<b>Time Required:</b> One 50 minute class period	<b>Materials and Media:</b> (texts, visuals, computer, projector, markers, websites) Computer, Projector, Document Camera, presentation with lesson information -tickets out the door from yesterday with my comments -interactive notebooks -memory game cards -vocabulary quiz -textbooks -Human Genetics Survey Handout: <a href="http://www.biologycorner.com/worksheets/geneticsurvey.htm">http://www.biologycorner.com/worksheets/geneticsurvey.htm</a>	
<p><b>Aligned Standards:</b> (Common Core/Content Area Standards)</p> <p><b>Aligned Standards:</b> (Common Core/Content Area Standards)</p> <p>Arizona Science Standards:</p> <p>Concept 2: Molecular Basis of Heredity Understand the molecular basis of heredity and resulting genetic diversity.</p> <p>PO 1. Analyze the relationships among nucleic acids (DNA, RNA), genes, and chromosomes.</p> <p>PO 2. Describe the molecular basis of heredity, in viruses and living things, including DNA replication and protein synthesis.</p> <p>PO 3. Explain how genotypic variation occurs and results in phenotypic diversity.</p> <p>PO 4. Describe how meiosis and fertilization maintain genetic variation.</p> <p>Common Core English Language Arts - Writing Standards:</p> <p>CCSS.ELA-LITERACY.W.9-10.2</p> <p>Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.</p> <p>CCSS.ELA-LITERACY.W.9-10.2.B</p> <p>Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.</p> <p>CCSS.ELA-LITERACY.W.9-10.2.D</p> <p>Use precise language and domain-specific vocabulary to manage the complexity of the topic.</p>		

CCSS.ELA-LITERACY.W.9-10.2.E

Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

CCSS.ELA-LITERACY.W.9-10.2.F

Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).

**Measurable Objectives:** *Ensure that learning is focused clearly enough that both students and teacher know the intended result of instruction.*

1. The students will be able to create a written list of at least 10 genetic traits with 100% accuracy.
2. The students will be able to match the 8 key vocabulary words with their definitions with 100% accuracy.
3. The students will be able to identify the main idea from a selected passage in the textbook with 80% accuracy.
4. The students will be able to use the results of a genetics survey to create a bar graph to represent the results of the survey with 90% accuracy.

**Criteria (Quantitative):**

Students will demonstrate proficiency in identifying genetic traits with 100% accuracy.

Students will demonstrate proficiency in matching key vocabulary words with their definitions with 100% accuracy.

Students will demonstrate proficiency in identifying the main idea from a selected passage with 80% accuracy.

Students will demonstrate proficiency in graphing the results of the genetics survey with 100% accuracy.

**Assessment Tool:** The students will take the vocabulary quiz as a formal assessment. The students' homework (bar graph) will be graded for accuracy as an informal assessment. Teacher observation of the students' work, questions and answers and the Parking Lot activity will all be used as informal assessments during the class period. The summative assessment for this lesson will be a lesson quiz with multiple choice, short answer and essay response questions that will be given at the end of the genetics unit.

**Purpose & Application:** *Access prior knowledge and building background, making connections of what they know to what they'll learn. Include examples of how people use this information in the real world.*

The purpose and application for this lesson will be covered during the first part of the instruction, right after the students read the lesson objectives. The teacher will guide the students to recognize the value of identifying different genetic traits and considering how common/rare those traits are. Students need to understand that recognizing these traits is a core component of studying biology and this knowledge will help them explain how common or rare the genetic traits that were passed to them (or that they

will pass to their children) are.

**Differentiation:** *How will you meet the needs of all your students (variables could include readiness, rate of learning, interest, learning styles, flexible groups, products demonstrating mastery).*

1. Course content will be presented visually and verbally to meet the needs of both visual and auditory learners.
2. Students will have the opportunity to match the vocabulary words with their definitions using the memory game cards, which will be beneficial for the tactile learners.
3. Students who need additional support with identifying the main idea will be provided with a cloze sheet that they will use to fill in the main ideas from the reading passage.

**Remediation:** *Re-teaching of the content using a multi-sensory approach or different method. Adapting and modifying instructional practices to deliver appropriate, responsive instruction for students.*

Students who need some additional support with the concepts in the lesson will be pulled together for small group instruction. Rather than simply reading the passage and selecting the main idea, the students will be guided by the teacher to consider ways that we can identify a main idea. The students will be asked to look at the title of the passage, any pictures, any sub-headings and predict what the main idea might be before they even begin reading. The teacher will also use the cloze sheet to help the students identify main ideas as they are reading. Depending on the group, the teacher might have the students take turns reading aloud. Finally, the teacher might ask the students to place a star next to the most important idea on the cloze sheet before transferring the idea(s) to the post it note(s).

**Extensions:** *Enhancement of the content (Bloom's Taxonomy/Webb's Depth of Knowledge) that will go above and beyond the measurable goals.*

Students who quickly grasp the concepts and need an additional challenge will be provided the opportunity to compare the results of our classroom Human Genetics Survey with the results of other studies that have been conducted in the scientific community. Students would need to locate the results of the study online and then present those results in their bar graphs next to our class results.

## Delivery

**Anticipatory Set:** *More than just words and discussion with your students. You can also engage in a brief activity or question-and-answer session to start the lesson plan off in a participatory and active manner which encourages engagement. (Lead-in \*written in Narrative Form):*

The teacher will tell the students, "Today, we are going to elaborate on what we learned about genetics yesterday. We are going to learn about how commonly certain traits are passed on from parents to their children. We are going to focus on our own classroom to conduct some research. Think about what you were working on at the end of the period yesterday." The teacher will return the students' exit tickets to them with her comments at this time.

Please re-read what you wrote yesterday and review my comments. Now, please answer the following

questions on the same paper:

1. What information did you consider when answering the first question?
2. If you added your grandparents and their eye colors to your list, would that help you respond more accurately to these questions. Explain your answer.

The teacher will ask the students to share their responses in their groups of four. The students will have approximately 4 minutes to share their ideas. The students will already be numbered off in their groups. The teacher will use the student selector spinner to call on one student per group (2-3 groups depending on time) to share the ideas generated by the group.

The teacher will call on 3 students to read the lesson objectives using the class set of index cards.

**Instructional Sequence:** *Numbered steps which detail teacher facilitated instruction with evidence of modeling, guided practice, active engagement strategies and checking for understanding (throughout the lesson) and differentiation of instruction.*

1. Following the Anticipatory Set, the students will review the 8 key vocabulary words for this unit by playing “memory” using cards provided by the teacher. Students will have 7 - 9 minutes to play the game.
2. Following the review time, the students will take a vocabulary quiz that requires them to match the vocabulary words with the correct definitions.
3. After the quiz, the students will read a passage from the text about types of traits that are genetic. Each student will read the assigned passage on his/her own. While the students are reading, they will take notes in their interactive notebooks.
4. When the students have finished reading the passage, each student will identify the most important idea from the reading and write it on a post it note. The students will then place their notes on the side board under the heading “Parking Lot” and group like ideas together. The teacher will summarize the main ideas the students identified.
5. In their interactive notebooks, each student will brainstorm a list of at least 10 genetic traits to get them focused on the traits that can be passed genetically.
6. The teacher will explain to the students that they are going to complete a survey of human traits. Each student will receive a copy of the Human Genetics handout.
7. Each student will complete the column titled “Yourself” on the handout.
8. The teacher will guide the students to complete the column titled “Class Numbers”. The teacher will need to use a variety of techniques to maintain the students’ interest. For example, the teacher could have all students who ear points raise their hands. Then, all students who can roll their tongues would stand. As students are identifying the traits they have, class totals need to be recorded on each individual student’s handout.
9. The teacher will explain that the students are going to create a bar graph showing the results of the Human Genetics handout for their class for homework. The teacher will remind the students that the graph needs to have a title. The graph should also be neat and easy to read. Finally, the graph needs to contain a key for those who are reading the results.

**Closure:** *Revisit/reflect on Anticipatory set and help students organize the information into a meaningful context in their minds. (\*written in Narrative Form)*

The teacher will tell the students to look at the results of the Human Genetics handout and identify 2 things that surprised them about how common or uncommon certain traits were. The teacher will then ask the students to turn to their shoulder partners. Partner A will have 1 ½ minutes to share his/her ideas. Then, Partner B will have 1 ½ minutes to share his/her ideas. The teacher will call on 3-4

students (using the index cards with the students' names on them) and ask each student to share 1-2 of his/her partner's ideas with the class.