Name:  
Lesson Title:  
SSI Topic:  
Lesson Length (class periods):  
Grade Level(s):  

Appropriateness for Middle/High School Students
Describe the teaching strategies used in this lesson that address the needs and interests of your students and how they build a cohesive science/mathematics experience for students.

Background
The concepts that will be covered in this lesson is on basic genetics and heredity. The students will learn about traits, which are inherited and which are learned/obtained as an organism develops. The lesson will prepare the students for more advanced genetics in high school biology by providing basic vocabulary and an understanding of genes and how they are expressed in an organism. The students will also learn and practice basic science skills such as predicting results, and collecting and analyzing data as well as writing a lab report and conclusion. Students will use the following vocabulary to describe the passing of genes as well as predicting and testing their predictions of genetic traits. Vocabulary:  Allele, Chromosomes, DNA, Dominant, Fertilization, Gene, Genotype, Heredity, Pedigree, Phenotype, Probability, Punnett square, Ratio, Recessive.

Provide a description (150-250 words) of the SSI-based science/mathematics concepts covered in this lesson.

Florida State Standards (NGSSS)
SC.7.L.16.1 Understand and explain that every organism requires a set of instructions that specifies its traits, that this hereditary information (DNA) contains genes located in the chromosomes of each cell, and that heredity is the passage of these instructions from one generation to another
SC.7.L.16.2 Determine the probabilities for genotype and phenotype combinations using Punnett Squares and pedigrees.

Performance Objectives
- The student will use vocabulary to explain how inheritable traits are passed down from parents to offspring.
- The students will use a punnett square to predict the percentage of genotypes and phenotypes of basic 2 allele traits in organisms.

Materials List and Student Handouts
- Paper, computer, projector, magazines, glue, poster paper, dirt, pea seeds, planter, plastic spoon.
- Students will be in groups of 3-4, each group will receive one of each item from material list.

5E Lesson Template
In the left column, list all activities you are planning. Also include information on how the class will be organized (grouping; individual work). The right column contains only probing questions you intend to ask of your students to guide their learning. For each phase, complete a brief (2-3 sentence) overview of what will occur in the space provided.
**Consider the following during the Engage:**
- Include an interesting attention grabber that focuses students’ interest and attention on the lesson content and activities.
- Introduce a **guiding question** that students should be able to answer at the end of the lesson.

**Probing Questions:**
- Elicit prior knowledge and students’ experiences.

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**ENGAGE**

**Overview**

Illicit background knowledge and establish basic knowledge through group activity and class discussion.

<table>
<thead>
<tr>
<th>Activities (Teacher or Student Actions)</th>
<th>Probing Questions</th>
</tr>
</thead>
</table>
| Show a picture of offspring (animals or people) and begin a discussion about traits and where they come from. The lesson will be directed towards differentiating between inherited genetic traits and learned/developed traits. Groups of 3-4 students will creat posters using pictures of organisms and short descriptions of physical and behavioral traits and where the organism obtained them. | What are traits?  
Where do living things get their traits?  
How do parents contribute their traits to offspring? |

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**Making A Poster : Traits**
Consider the following during the Explore:

- Explain how your students will explore the concept(s), relating specifically to SSI-LPAI elements when appropriate, including students’ interests shared during the Engage.

Probing Questions:

- Design questions that guide student explorations, evaluate student understanding, and facilitate student interaction and group collaboration.

### EXPLORE

**Overview**
Students will explore genetic traits and practice using punnett squares to predict traits of basic 2 allele phenotypes.

<table>
<thead>
<tr>
<th>Activities (Teacher or Student Actions)</th>
<th>Probing Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A digital lesson and digital lab will demonstrate how</td>
<td></td>
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</table>
Consider the following during the **Explain**:
- Have students share and explain the results of their investigation. Connect to relevant SSI-LPAI elements.
- Add additional content, including definitions, explanations, and new vocabulary in the context of concepts explored.

**Probing Questions:**
- Ask probing questions to deepen students’ conceptual understanding and skills of the concepts that the lesson is based upon.

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**EXPLAIN**

**Overview**

Students will learn and use the target vocabulary by explaining how traits are passed genetically and how a punnett square is used to predict probability ratios of simple 2 allele phenotypes.

<table>
<thead>
<tr>
<th>Activities (Teacher or Student Actions)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>The chapter of genetics and heredity will be pair read and each pair will use the chapter to complete frayer models of the listed vocabulary. Finally each pair will read a summative paragraph that utilizes each of the vocabulary words describing passing of genetic traits and use of punnett squares.</td>
<td></td>
</tr>
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Consider the following during the **Elaborate**:
- Opportunity to provide students with the chance to transfer and extend (apply) the concepts and skills they have just learned to their interests and new situations.

**Probing Questions:**
- Connect and apply the lesson to students' interests outside the classroom.

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**ELABORATE**

**Overview**

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Adapted from UFTeach
**Activities (Teacher or Student Actions)** | **Probing Questions**
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**Consider the following during the Evaluate:**
- Utilize the grading rubric you designed for the formative assessment tool *(during session 4)* to assess the students’ mastery of all benchmarks.