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### **SIOP Lesson Plan**

**Date:** March 23, 2019

**Grade/Class/Subject:** 9<sup>th</sup> Grade Statistics

**ELL English Proficiency Level:** Level 4

**Unit/Theme:** Probability and Outcome

**Standards:** 9th Grade Common Core Mathematics Standards of Pennsylvania

CC.2.4.HS.B.4- Recognize and evaluate random processes underlying statistical experiments.

CC.2.4.HS.B.7- Apply the rules of probability to compute probabilities of compound events in a uniform probability model.

#### **Content Objectives:**

- Students will use probability to estimate the amount of times each color of an M&M will be pulled out of a bag
- Students will collect and display data during the M&M experiment

#### **Language Objectives:**

- Students will use correct vocabulary when discussing the possible outcomes of the M&M experiment.
- When working with a partner, students will be able to explain their hypotheses of the outcome of the M&M experiment.
- Students will correctly record data from the experiment.
- Students will make associations/connections with key vocabulary words by using a “Verbal and Visual Word Association” chart (Students separate their vocabulary words into 4 boxes consisting of the word, a visual representation, definition/equation, and a personal association)
- Students will listen to their classmate’s experiment results.
- Students will construct a written summary of the use of vocabulary words in probability

#### **Key Vocabulary:**

##### **Content Vocabulary**

- Event
- Outcome
- Certain
- Likely
- Unlikely
- Impossible
- Probability
- Percentage
- Fraction

### **Functional/Language Vocabulary (ELL)**

- Dice- The teacher will use a cube to demonstrate how vocabulary plays into probability (event, outcome, probability, percentage)
- Circle Graph- The teacher will use a circle graph to help students develop an understanding of what a percentage is. When talking about percentages, the teacher will refer to the circle graph. Students will eventually be asked to construct their own circle graph of their collected data.
- Word Wall- Key vocabulary words throughout the unit will be displayed in the classroom on the “Word Wall” and will be referred to when they are used in the classroom. The teachers and students will be asked to point to it when they use it to stress the importance of the words.
- Vocabulary Flashcards- The teacher will construct flash cards of definitions and of the vocabulary words. Half of the students will get the words and the other half will get the definitions. They will have to match up with a partner that has their matching word or definition.
- Hypothesis- Students will be asked to Hypothesize about outcomes.
- Experiment- The teacher will refer to the classroom activity as an experiment so students must understand what an experiment is.
- “Verbal and Visual Word Association” Chart- Students will be using this to separate their vocabulary words into 4 boxes consisting of the word, a visual representation, definition/equation, and a personal association so that they make connections between the words and their life

### **Supplementary Materials:**

- Dice
- M&M’s
- Verbal and Visual Word Association Charts
- Circle Graph

<b>SIOP Features</b>		
<b>Preparation</b>	<b>Scaffolding</b>	<b>Grouping Options</b>
X Adaptation of Content	X Modeling	X Whole Class
X Links to Background	__ Guided Practice	__ Small Groups
X Links to Past Learning	X Independent Practice	X Partners
X Strategies Incorporated	X Comprehensible Input	X Independent
<b>Integration of Process</b>	<b>Application</b>	<b>Assessment</b>
__ Reading	X Hands-On	X Individual
X Writing	X Meaningful	__ Group
X Speaking	X Linked to Objectives	X Written
X Listening	X Promotes Engagement	X Oral

### **Lesson Sequence:**

**Anticipatory Set:** The teacher will test the prior knowledge of the students in the classroom through the use of a knowns/unknown's chart. Students will identify what words they know, which words they are familiar with, and which words they have not heard. These words will include math vocabulary as well as words that the teacher will use throughout the lesson that an ELL student may not be familiar with. As a vocabulary strategy, students will be given a Verbal and Visual Word Association Chart. The definition of the word will be provided. However, students will be asked to construct their own visual and association of the word.

**Model:** The teacher will use a dice to demonstrate how probability works. The teacher will refer to vocabulary words throughout the demonstration so students can see how the words play into probability. An outcome will first be predicted for the amount of times the dice will land on 4

when it is thrown 15 times. The actual results will be recorded and compared to hypotheses and the process will be explained. Then a circle graph of the data will be displayed on the board to provide a visual of the percentage that each number was rolled on the dice. The students will be given time to work on their Visual Word Association Charts.

**Partner Independent Practice:** Students will be paired up with a partner to perform a similar experiment, but with M&M's. The activity will ask them to predict the number that each color of an M&M will be pulled out of a bag after 50 pulls. The students will be asked to write/discuss their hypotheses of the outcome, perform and record data from the experiment, and construct a circle graph to serve as a visual of the collected data. This activity is hands-on and will help the students better understand how probability is used. The teacher will facilitate by monitoring and assessing the students on the use of their math key vocabulary and help clear up any misconceptions or misunderstandings that may occur. The teacher will also ask questions to check for understanding while the groups are completing their experiments.

**Closure:** Students will be asked to write a brief summary on which vocabulary words were used throughout the experiment. Students may talk with their partner before completing their summary. These will be collected to evaluate student understanding.

**Reflection:**

The teacher will have to have a good understanding of the level at which each student is at. Students that are ELL's should be placed together when paired into groups so that they are working at a similar pace and helping each other understand. Students that struggle with vocabulary, may require more facilitating done by the teacher. For example, the teacher may ask questions to check for understanding more often than students that show a good understanding/usage of the key vocabulary words. The more the students work, speak, and listen to these words, the more comfortable it will become for them.

**Motivation (Building Background):**

The teacher will stress the importance of vocabulary in math as well as the relevancy it has in every-day life. The teacher will link to students' cultural backgrounds by asking: "When does probability take place in your own lives?". The teacher will relate prior knowledge to this lesson by explaining how fractions are used in probability.

**Presentation:**

The teacher should talk with appropriate speech by talking at a slow pace, using selective vocabulary, and incorporating repetition. Academic tasks should be explained clearly by having objectives written on the board, reading the objectives out loud, written and spoken directions, having students repeat back directions, and modeling of activities. Clarification of content

concepts as well as vocabulary are also very important. This may be done through the use of asking follow up questions, referring to the word wall, and using visuals.

### **Practice/Application:**

The students will be provided with hands on activities to practice new concepts. This consists of the dice, M&M'S, circle graphs, flash cards, and verbal and visual word association charts. The students will practice writing by recording data and writing a summary. The students will practice speaking and listening by working with a partner.

### **Review/Assessment:**

A review of vocabulary will be done through a flash card activity. Some students will be provided with definitions of words and other students will be provided with words. The students will have to find the match to their flash card to complete the definition. This will be a fun way to incorporate social interaction as well as a good review of vocabulary. There will also frequent feedback provided to students regarding language production and the application of new content concepts. This will be done through questioning and clarification in both the whole-class setting as well as small groups or individual settings. The teacher will also be observing during partner work. The work done in class will be collected to evaluate student understanding.

### **Extension:**

The teacher could extend this activity by having students present the outcomes of the experiments to the class. They would be asked to present their circle graph to serve as a visual, compare their results to their original hypothesis, and discuss which vocabulary words they used throughout the experiment.

### **Strategies:**

- Following oral and written directions
- Asking/answering questions
- Participating in individual, partner, and whole class discussions
- Explaining actions
- Listening, speaking, and writing about math
- Using visuals
- Hands-on activities (dice and m&m's)
- Collecting information orally and written
- Responding to the work of peers
- Social interactions through flash card activity
- Word wall

- Visual and verbal association chart
- Hypothesizing/predicting
- Comprehensible Input: appropriate speech, academic tasks explained clearly, and techniques to clarify content concepts