Lesson Plan #4

Review Stations

Grade: 7th grade

Subject: Mathematics

About the class:
- 20 students- 11 boys, 9 girls
- 7 students are special education students
- One-teach, one-assist format used with special education teacher

Standards:

7.SP.5. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

7.SP.6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.

7.SP.8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

7.SP.8.a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

7.SP.8.b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.

7.SP.8.c Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

Objectives:

- Students will define simple and compound events.
- Students will construct a tree diagram to represent all outcomes of a compound event.
Students will create a sample space to list all possible outcomes based upon a tree diagram.

Students will formulate events with a probability of 0, \( \frac{1}{2} \), and 1 based upon a given situation.

Students will compare and contrast theoretical and experimental probability.

Students will design a simulation for a given situation.

**Vocabulary:**

- Simple Event
- Compound Event
- Tree Diagram
- Sample Space
- Theoretical Probability
- Experimental Probability
- Simulation

**Orientation/Engagement/Motivation:**

This lesson is designed to assess students understanding of probability thus far in the unit. Prior to this lesson students have learned about the probability of simple events and compound events, tree diagrams, sample spaces, and simulations. This lesson will incorporate stations into the learning environment giving students an opportunity to move around the classroom as they get a chance to sincerely practice the material they have learned in real world situations.

Students generally enjoy station work because they are able to move at their own pace and choose problems to complete. This also gives me, the teacher, a great opportunity to give struggling students further assistance that they would not be able to receive if I kept the class in a large group setting. Students tend to be good at helping each other complete the problems at hand.

**Presentation/Explicit Instruction:**

When students walk into the classroom I will have them take out the previous night’s homework assignment so that they are ready to discuss it when the bell rings. I will then allow students to compare their answers with their learning partner’s while I quickly walk around the room to check for completion. As soon as I have finished checking the homework, I will post possible answers on the board for students to compare their answers to. I will ask one or two students to share their answer with the class for each of the four questions on the homework. It is important students understand how choosing a particular simulation “tool” can be more useful than another and that there is always more than one choice when choosing a simulator tool.

Once all questions about simulations have been covered I will distribute a sheet of paper that has outlined areas for students to answer each station. I will alert students that they must
complete at least four stations prior to the end of the period and that this will count as their graded assignment for the week.

Students will then have the remainder of the period to complete the stations. As I finish up passing worksheets out and putting the stations around the room I will ask the class what they should do if they do not remember a word, definition, or how to do something. This will serve as their reminder to look back in their notes if they get stuck at a station.

**Closure:**

When there are two minutes left in the period I will have all students return to their seat so that I can collect all station work from them. I will then ask if anyone has any further questions about anything we have talked about thus far to keep the class focused until the bell rings.

**Assessment:**

This entire lesson serves as the formal formative assessment for this learning segment. It is designed to cover each of the objectives covered in the previous three lessons. Although students may not be able to complete all six stations, by covering four and showing they have mastered the material is enough to show just how much of the content taught they have learned, understood, and are able to apply successfully.

Throughout the period I will also be informally assessing students as I observe them completing stations and as they talk to each other about the material. Through these observations I will be able to tell who understands what material and where major misconceptions lie so that I know we need to cover these again in a future lesson.

**Differentiation:**

Each of the six stations are designed at different levels for students. Therefore if I know a student is struggling with the content I may be able to tell them to try one of the less challenging stations to begin. One of the stations I may tell a struggling student to begin at may be the first station where it reviews vocabulary. This would be a good starting point as it allows the student to look back in their notes for the definitions of the vocabulary. This vocabulary is something they will certainly need to know to complete future stations.

Another way this lesson uses differentiation is if a student has been absent for the entire or at least part of the three previous three lessons I can pair them up with a pair of stronger students in order to help them learn the material. These stronger students can explain the material to the student who has missed a few days of class in order to catch them up.

**Materials:**

- 6 folders with one station question in each
- Outlined probability station answer sheet
Outline of the lesson:

1. Have students take out the previous night’s homework as their warm up and compare their answers with their learning partner. The teacher will come around and check for completion while students compare answers. (2 minutes)

2. Show possible answers to the homework questions on simulations on the Smartboard. Have students provide their examples as other alternatives to the question. They should explain why the “tool” they chose would be a good match for the situation. When finished answer any lingering questions about simulations. (4 minutes)

3. Distribute the outlined probability station answer sheets and place the six stations around the room. Explain to students that they must complete a minimum of four stations prior to the end of class for full credit and that this will count as their graded assignment for the week. As always if they complete more than four stations correctly they will be granted extra credit points. Remind students to check their notes for help if they get stuck on a problem. As students complete the stations, walk around and give them a stamp for any fully correct answers. (about 30 minutes)

4. When two minutes remain in the period bring all students back to their desks. Collect their completed answer keys. Ask if there are any questions about anything learned thus far with probability. (2 minutes)

**Listed below are the six stations students were to answer as well as their answer sheet they were expected to write the answers on**
Station #1

1. Define:
   a. Simple Event
   b. Compound Event

2. Give an example of a:
   a. Simple Event
   b. Compound Event

Station #2

The two coins shown below are tossed and the spinner is spun.

Draw a tree diagram to show all possible outcomes.
Station #3
You are at a carnival. One of the carnival games asks you to pick a door and then pick a curtain behind the door. There are 3 doors and 4 curtains behind each door.

a. Create a sample space to show all possible outcomes for choosing one door and one curtain at the carnival.
   b. Find the probability that curtain c will be chosen.

Station #4
Sara has a box that holds 7 blue marbles, 5 purple marbles, 3 white marbles, and 15 red marbles. She pulls one marble out of the box without looking.

a. Create an event that would have a probability of 0.

b. Create an event that would have a probability of \( \frac{1}{5} \).

c. Create an event that would have a probability of 1.
Station #5

Explain the difference between theoretical and experimental probability using pictures and/or words.

Station #6

The questions on a multiple choice test each have four answer choices. Describe a model that you could use to simulate the outcome of guessing the correct answers to a 50-question test.
Probability Stations

Station #1

1. a. Simple Event: ____________________________________________________  
   ________________________________________________________________

   b. Compound Event: _______________________________________________  
   ________________________________________________________________

2. a. Simple Event ___________________________________________________  

   b. Compound Event _______________________________________________  

Station #2 Tree Diagram

Station #3 Sample Space

b. $P(\text{Curtain C}) = \_\_\_$