

**Teacher: Mr. Brandon Debert & Catlyn Todorovich**

**Subject: Math**

**Grade: 7/8**

**Lesson Length: 45 Minutes**

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**Outcome:**

**SP8.2 - Demonstrate understanding of the probability of independent events concretely, pictorially, orally, and symbolically. [C, CN, PS, T]**

**Indicator:**

- Explore and explain the relationship between the probabilities of two independent events.

**Purpose:**

**Materials/ Equipment:**

- Tasks for Dices rolls
- Dice
- Whiteboard Markers

**Preconceptions:**

**Lesson:**

Break the students into groups, hand out two dice to each group and explain the following:

1. *Contextual Features:* Make sure students understand the rules of the game by introducing the tasks for each number rolled, Write these instructions on the board for visual cues (*Reinforce continually rolling the dice so that the students can get a number of chances to perform tasks – from this it will allow students to see patterns and recognize theoretical probability*):

- a. **2- Jump**
- b. **3- Spin in circle**
- c. **4- Touch your toes**
- d. **5- Wave to your partners**
- e. **6- Clap**
- f. **7- Jumping Jack**
- g. **8- Fist Pump**

- h. 9- Beat your chest like a gorilla**
- i. 10- YMCA**
- j. 11- Gallop**
- k. 12- Elephant noise**

2. *Mathematical Ideas:* Students are looking for patterns, relationships for this they should keep in mind what numbers are being commonly rolled. They should keep track of the outcomes of rolling a specific number.
3. *Common Language:* As a group the students should start seeing common patterns. (*This would be a good time to introduce the term of probability*)

As the students play the game, we will walk around the classroom and monitor the conversations and actions that are being done as a result of rolling the dice. Once they have explored the task for some time we will bring the classroom back for some discussion:

- *What do you notice happening the most?*
- *I noticed you were doing (Task), why is that?*
- *Is rolling a 6 & 2 = 8 same as rolling a 2 & 6 = 8? (Works with any number)*
- *How are you organizing what you know for sure?*
- *Keep track of the different approaches, correct/incorrect forms.*

If students do not notice the patterns/relationships of the two independent events then they will go back to playing the game. This time they will be conscious of what they are seeing/doing while rolling the dice.

After they play the game a second time we will make a chart of the probability of rolling a certain number and discuss their understanding of the events:

- *Describe the patterns you found for me. Can we write them out in some sort of chart? Better way of understanding?*
- *How many different ways can we roll a dice?*
- *How come there are less ways to roll a two but more to roll a 7?*
- *What patterns do you notice? How many times did you do a task?*
- *Can you get a six anyway other than rolling a '1&4'/'4&1'/'2'&3'/'3&2'?*
- *What do you think that chart would look like? Why do you think that?*
- *What will happen if we introduce three dice? Or different color dice?*

## Theoretical Probability for Sum of Two Dice Tossed

	1	2	3	4	5	6	7	8	9	10	11	12
Theoretical probability for the sum of two six-sided dice.	0	1/36	2/36	3/36	4/36	5/36	6/36	5/36	4/36	3/36	2/36	1/36

Taken from: <http://staff.argyll.epsb.ca/jreed/math8/strand4/4203.htm>

Roll						
2	1/1					
3	1/2	2/1				
4	2/2	1/3	3/1	2/2		
5	2/3	1/4	3/2	4/1		
6	2/4	1/5	3/3	4/2	5/1	3/3
7	2/5	3/4	1/6	6/1	4/3	5/2
8	2/6	4/4	3/5	6/2	4/4	5/3
9	5/4	3/6	6/3	4/5		
10	5/5	6/4	4/6	5/5		
11	6/5	5/6				
12	6/6					

- This chart would help a student notice the patterns and further define probability
- From the same chart it would also show a student the different ways of rolling a certain number. (Ex. 2/3 or 3/2 both equal "5")
- Students may use other means of getting to the number six, other than by adding the two dice together. (Ex. They may roll a "6", and a "1" – from this they may see that they have rolled a six without adding the other dice)

**What difficulties might students encounter?**

- Students may have errors in adding.
- Students may not recognize the patterns easily.
- Take too much time focusing on smaller numbers that have less probability
- Students may not have background knowledge of probability. May need to scaffold them to this understanding.

**Final Task/ Assessment:**

**Exit Slip: What do you think you know about probability?**