**Lesson Plan**

**Grade 12-Data Management**

GRADE LEVEL: 12 DATE:
STRAND: Counting and Probability

TOPIC: Solving Probability Problems TIME: 75 Minutes

**1.Instructional Expectations**
**Expectations- Overall and Specific Expectations- 1-3 specific expectations from the Ontario curriculum that could be assessed.**

Overall Expectations:
Solve Problems involving the probability of an event or a combination of events for discrete sample spaces

Specific Expectations:
Recognize and describe how probabilities are used to represent the likelihood of a result of an experiment, and the likelihood of a real-world event

**b) Other objectives: (approx. 1 0r 2 other learning opportunities such learning skills that won’t be assessed formally- group listening, working in groups, independent learning etc.)**
Discover different forms of probability (ie conditional probability), and terminology of probability (ie sample space), exposure to concepts, save in depth lessons for later in the course

**c) Learning Goals- These will be placed on the board**
Discover what probability means in real life terms

**2- Prior Knowledge and Accommodations/Modifications**
**a) Students- consider the students that you will be teaching and anything that would affect their learning or your teaching strategies- how will you differentiate learning?**

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| **Prior Learning** | **Accommodations/Modifications** |
| Previous life experiences with probabilityPrevious class experiences with probability, for example rolling dice | Cooperative play for students struggling, as opposed to the competitive play, pair them up with students who are stronger with math and probability |

**b) Learning Environment**
**Describe the learning environment such as the set up/location of desks, where audio-visual equipment will be, where the teacher stands and where the students are working etc. You may wish to include a map/layout of the classroom on a separate sheet and reference it with modifications if lesson changes**
Students will be placed in to groups, roughly about four to five groups with each group having four to six members. They will all be separated into different parts of the room. If necessary, students will join desks so as to sit in a circle while playing. The instructor will supervise each of the groups, ensuring they are playing correctly and to see how they are grasping the content being taught through the game. Also, have a timer on the board for each round (1 minute each round). For a classroom layout, move desks into groups based on how many of them are in the class.

**3- Required Resources**
**(List all resources to conduct this lesson with detailed specifics such as textbook titles, chapters, page numbers, website URLs, handouts, lab materials etc.**

Notepads

Dice

Game Instructions

Game Cards

Summary handout

Timer

**4- Content and Teaching Strategies**
**a) Overview/Agenda/Review**
**(consider a quick overview of the lesson and/or list key elements in the lesson which may be written on board as an agenda for students and you to follow-you may also choose to review previous day’s work.**

Since we are starting a new unit with completely new material, there is no need for any review prior to the lesson past a short minds-on about probability concepts learned from the elementary school level.

15 mins- Brief overview of Probability

15 mins- Explanation of Game

30 mins-Game Play

15 mins- debrief and discussion, handout summarizing today’s lesson

Should any of these parts of the lesson not reach their intended length, more time can be given to playing the game and/or the handout at the end. If the handouts are not completed by the end of the class, it can be assigned as homework to be finished by the next class.

 **b) Introduction-hook etc.**
(describe how you will motivate students, get their attention, and relate the lesson to their lives, such as a hook or something that will pull learners into the lesson.

**STARTER ACTIVITY (HOOK) ASSIGNMENT (10-15 Minutes)**

**Subject**: Probability Concepts

**Overall Expectations:**

Discuss previous knowledge & experiences with probability

**Overall goals of hook:**

To grab attention of students and get them interested for the game

**Specific goals for the hook:**

Engage students

Prepare them for the game

Warm up their minds and get the students thinking about probability

**Description of activity:**

Includes motivation strategies: Promise of game activity today should they behave during the minds on

Method: Minds on questions for students as they come in. Questions tackling identifying probabilities of events occurring, and stating scenarios which have a specific probability of occurring

**c) Subject Content and Teaching Strategies**

Include the subject content-what you are teaching; detail the instructional strategies/teaching strategies-how you are teaching it, with some guiding questions-bloom’s taxonomy with suggested and anticipated answers-possibly include approximate timelines such as 10:00- 10:30 or 30 minutes and include anticipated activities/components-how the content will be applied such as an activity, problems to solve, worksheets etc.

**Lesson Item 1: Brief overview of Probability (15 mins)**

**Instructional / Teaching Strategies:**

Gauge what the students already know about probability from past courses and grade levels. Engage students and open up discussion on probability and their real life experiences of it. Give basic explanation of what probability is, how to find it, and how we use it in real life for making certain decisions.

**Lesson Item 2: Game Introduction (15 mins)**

**Instructional / Teaching Strategies:**

What the game is, and its instructions will be explained. Then the materials for the game will be distributed to the students, so their attention is not lost during the explanation. Give examples of what students may run into in the game and ask students what they should do to ensure they know the rules and were attentive during the instruction. Place students into their groups appropriately. If certain students are found to be struggling, they can be placed with a stronger student and take part in a cooperative game.

**Lesson Item 3: Game play (30 mins)**

**Instructional / Teaching Strategies:**

The game will be played. (for running the game see instructions attached).

Supervise students as they play through to see how they find the game and if they are grasping the material of the game.

**Lesson Item 4: Debrief/Summary (15 mins)**

**Instructional / Teaching Strategies:**

Have students clean up the games and return the materials into the boxes and return to their original seats. Hand out the worksheet that details and summarizes what we have learned from the game in today’s lesson. Students can complete the few questions on the worksheet to apply what they have learned. If they have not finished by the end of class, they can finish the questions for homework.

**d) Consolidation/Practice/Check for Understanding**

Indicate how you will review concepts taught, wrap up lesson, confirm students know what next tasks are- eg-having class give you feedback on what was taught-exit pass-review key application of concepts-this is important in terms of assessing the effectiveness of the lesson-remember to have an end of period activity to ensure that students are actively working to end of period.

Students will clean up the games and return all materials into their boxes and return to their seats. For consolidation, they will receive a worksheet to summarize some of what they have learned today. It will include helpful definitions of probability terms, an example question they may see in their homework or on a test, and a question they will attempt to complete on their own to see how much they took away from the game.

**5. Assessment Strategies**
**What assessment and/or evaluation strategies do you need to have to ensure you are accountable for students’ learning and addressing the Ontario curriculum expectations? What formative and summative assessment should include?-eg-sample questions, activities, tests, rubrics, evaluation schemes, answer keys etc.**

The worksheets can be submitted to the teacher to see the usefulness of the pedagogical tool and how well the students are grasping the material at hand. Formative assessment could be an assignment or worksheet the students may use midway through the unit. The summative assessment will include a test covering the material in said unit the pedagogical tool was introduced in.

**6-Follow -up**
**Outline the content of the next few lessons**

The next topics covered would include content on the following topics:

* Basic probability terms
* Explain sample spaces, events, etc.
* Unions and intersections

**7-Reflections**
a) **Effectiveness of Lesson**
**What was effective/ineffective in your lesson?** Include at least three elements there were ineffective/ineffective. What went well in your lesson-what did not go well? What did the students enjoy? How did your planning or
delivery turn out? Did your teaching/learning strategies work effectively or not for the subject content and class. Consider the entire lesson and the reaction of the students.
**How do you know?** Provide evidence from student work, student questions asked and informal assessment. Think about examples of how the lesson progressed, engagement of students, flow of delivery, time management.
**Next Steps?** Indicate what steps you are going to take to continue to work on your three elements identified.

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| What was effective/ineffective in your lesson? | How do you know? | Next steps for improvement |
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**b) Effectiveness as a Teacher**

**What was effective/ineffective about you as a teacher?**- include at least 3 teacher elements that did that were effective or ineffective. Did you ask good questions? Did you motivate students? What did YOU do well? This would be a section describing your strengths and areas for improvement-volume, eye contact, body language, questioning skills, responding to questions, comfort with the material, confidence, delivery, board writing, and vocabulary.

**How did you know?** What evidence do you have that you, as a teacher, were or were not effective? Think about examples of what you said, did, reacted to,

**Next steps?** Indicate what steps you are going to take to continue to work on your three elements identified

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| What was effective/ineffective about you as a teacher? | How do you know? | Next steps for improvement |
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Some basic definitions about Probability-MDM4U

Experiment - an action where the result is uncertain ( ie flipping a coin)

Sample Space- all the possible outcomes of an experiment

Sample Point-One of the possible outcomes

Event- a single result of an experiment

Union- The probability where Event A **or** B happens

Intersection-The probability where Event A **and** B happens

Mutually Exclusive –Two events that **cannot** occur at the same time

Probability is defined as number of ways it can happen Total number of outcomes

Example 1

John has a 6-sided die. He wants to determine the probability of rolling a 4. Determine the experiment, the sample space, a sample point, and an event from this scenario. Also determine the probability

Solution:

The experiment is the rolling of the die. The sample space is {1-6} as these are the only possible outcomes. A sample point would be {1} as that is a possible outcome. An event would be, you roll a 3. The probability of rolling a 4 would be 1/6, as you can only roll a 4 one way, and there are 6 possible outcomes.

Problem

Jenny has a deck of cards and a die. She wants to pull two cards from the deck, first card a heart and second a spade. Then she wants to roll a number on the die that is three or less. Determine the probability of this scenario.

Solution: