LESSON PLAN

Level : Senior High School
Lesson : Mathematics
Grade/Semester : XI/1
Duration Time : 30 Minutes

A. Standard Competence

Using statistics rules, counting rules, and characteristics of probability in problem solving.

B. Basic Competence

Determining probability of an event.

C. **Indicators**

1. Determining experimental probability of an event.
2. Determining theoretical probability of an event.

Learning Objectives

1. Students are able to determine experimental probability of an event.
2. Students are able to determine theoretical probability of an event.

Lesson Subject

Probability

Learning Model

Learning model : Cooperative Learning

Type : Students Team Achievement Division (STAD)

Learning Steps

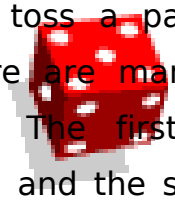
a. Introduction

1st phase: Clarify the learning goals and motivate students.

1. Clarify the learning goals.
2. Facilitate students to remember the last lesson about counting rules, permutation, and combination.
3. Motivate students by relating this lesson to their daily activity.

   Example:

   When you toss a pair of dice in a game, there are many possibility of the result. The first die could be appeared 5 and the second die could be appeared 3, or the other possibility. Then, give an example in tossing a die. But, before tossing a die, ask one of students to predict what number will be appear?



b. Main activities

2nd phase: Clarify the information.

1. Inform the students about probability of an event and how to determine probability.
2. Inform to students about the learning that will be done, that is Students Team Achievement Division. They will be organized in groups and the score of groups is based on the quiz score of each member in the group.

3rd phase: Organizing students in groups.

3. Organize the students into some group consists of 3-5 person.
4. Distribute a worksheet to each group.

4th phase: Guiding the groups

5. Ask students to do their worksheet in their group.
6. Give chance to each group to ask if they don't understand about the worksheet.
7. Analyze students' works and give motivation to them.
8. Ask students to write and conclude the result of their group discussion.

5th phase: Evaluation

9. Choose some groups to present their group's result in a class discussion.
10. Give opportunity to the other group to comment or ask questions about the presentation.
11. Teacher and students evaluate the presentation and teacher give right answer if there is mistake in students' presentation.

Giving Individual test (Quiz)

12. Ask students to back in their own chair.
13. Give quiz to the students and ask them to solve individually.
14. Collect the quiz.

c. Closing

1. Summarize the lesson.

6th phase: Giving rewards

2. Give rewards to the best group based on the score group.
3. Give homework.

Materials and source

Sources:

- Urban, Paul. 2004. Mathematics for the International Students. Mathematics HL (Core). Australia : Haese and Harris Publication
- http://illuminations.nctm.org/Lessons/ProbExplorations/WhatAreMyChances-AS.pdf
- http://nrich.maths.org/583
- http://www.mathgoodies.com/lessons/vol6/intro_probability.html

Materials:

- A pair of dice
- 2 packs of cards
- 2 coins

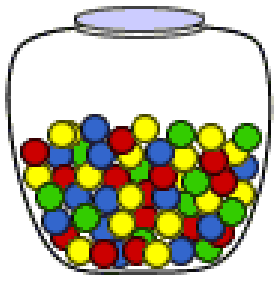
Assessment

Technique : Written Test

Instrument model : Quiz

D. Instrument (Quiz)

1. A glass jar contains 6 red, 5 green, 8 blue and 3 yellow marbles. If a single marble is chosen at random from the jar, what is the probability of



choosing a red marble? A green marble? A blue marble? A yellow marble?

2. A pair of dice is rolled. Determine the probability of getting :
   a) A sum of 7 or 11
   b) A sum greater than 8
3. A ticket is randomly from a basket containing 3 green, 4 yellow, and 5 blue tickets. Determine the probability of getting :
   a. A green ticket
   b. An orange ticket
   c. A green or yellow ticket
   d. A green, yellow, or blue ticket

E. Scoring Rubric

No.	Answer	Score
1.	The possible outcomes of this experiment are red, green, blue and yellow. There are 22 outcomes : 6 red, 5 green, 8 blue and 3 yellow marbles 6 + 5 + 8 + 3 = 22	2
	Probabilities: $P\ (red) = \frac{the\ number\ of\ ways\ to\ choose\ red}{the\ total\ number\ of\ marbles}$ $= \frac{6}{22}$ $= \frac{3}{11}$	7
	$P\ (green) = \frac{the\ number\ of\ ways\ to\ choose\ green}{the\ total\ number\ of\ marbles}$ $= \frac{5}{22}$	7

	$P\ (blue) = \frac{the\ number\ of\ ways\ to\ choose\ blue}{the\ total\ number\ of\ marbles}$ $= \frac{8}{22}$ $= \frac{4}{11}$ $P\ (yellow) = \frac{the\ number\ of\ ways\ to\ choose\ yellow}{the\ total\ number\ of\ marbles}$ $= \frac{3}{22}$	7 7
	Subtotal scores = 30	
2.	The sample space is : {(1,1), (1,2), (1,3), (1,4), (1,5), (1,6), (2,1), (2,2), (2,3), (2,4), (2,5), (2,6), (3,1), (3,2), (3,3), (3,4), (3,5), (3,6), (4,1), (4,2), (4,3), (4,4), (4,5), (4,6), (5,1), (5,2), (5,3), (5,4), (5,5), (5,6), (6,1), (6,2), (6,3), (6,4), (6,5), (6,6)} a. The event of getting a sum of 7 or 11 : {(1,6), (2,5), (3,4), (6,1), (5,2), (4,3), (5,6), (6,5)} So, the probability of getting a sum of 7 or 11 is : $P\ (1\ sum\ of\ 7\ or\ 11) = \frac{8}{36} = \frac{2}{9}$ b. The event of getting a sum greater than 8 : {(3,6), (4,5), (4,6), (5,4), (5,5), (5,6), (6,3), (6,4), (6,5), (6,6)} So, the probability of getting a sum	11 12 12

	greater than 8 is: $P\ (1\ sum\ greater\ than\ 8) = \frac{10}{36} = \frac{5}{18}$	
	Subtotal scores = 35	
3.	The sample space is : {G, G, G, Y, Y, Y, Y, B, B, B, B, B} Which has 3 + 4 + 5 = 12 outcomes a. $P\ (G) = \frac{3}{12} = \frac{1}{4}$ b. $P\ (G\ or\ Y) = \frac{3+4}{12} = \frac{7}{4}$ c. $P\ (O) = \frac{0}{12} = 0$ d. $P\ (G\ or\ Y\ or\ B) = \frac{3+4+5}{12} = \frac{12}{12} = 1$	3 4 7 7 7 7
	Subtotal scores = 35	
	Total scores = 30 + 35 + 35 = 100	

Worksheet

Group :
Member of the group :
.....
.....
.....
.....

Date:

Main Material : Probability

Learning Objectives :

1. Students are able to determine experimental probability of an event.
2. Students are able to determine theoretical probability of an event.

What Are My Chances?

You will be evaluating games of chance to help you understand probability. For each game of chance, predict what will be the most frequent outcome. Then run the experiment 10 times. For each trial, record the actual outcome in the Result row. If this matches your predicted outcome, put a check mark in the Prediction row.

1. Flip a Coin

Prediction for most frequent outcome: Heads Tails

Result										
Prediction										

2. Roll 1 Die

Prediction for most frequent outcome: 1 2 3 4 5 6

Result										
Prediction										

3. Pick a Card Color

Prediction for most frequent outcome: Red Black

Result										
Prediction										

4. Pick a Card Suit

Prediction for most frequent outcome: Clubs (♣) Spades (♠) Diamonds (♦) Hearts (♥)

Result										
Prediction										

5. Pick an Exact Card

Prediction for most frequent outcome: _____ (e.g., 3♥)

Result										
Prediction										

6. In which game of chance were your predictions most accurate?

7. Complete the table below with the probability for each event. Use the results from your experiments above to calculate the experimental probabilities.

Game of	Event	Experimenta	Theoretical

Chance		l Probability	Probability
Flip a Coin	Heads		
Roll 1 die	6		
Pick a Card Color	Red		
Pick a Card Suit	Diamonds		
Pick an Exact Card	5 of diamonds		

8. Compare the theoretical and experimental probabilities for each game of chance.

9. Collect data from the entire class for the probability of an event matching the predicted event (**Note:** This works even if different groups predicted different outcomes.) Record the number of correctly predicted trials and the experimental probability of each. Since each group performed 10 trials for each game, the number of trials will be 10 × the number of groups.

Game of Chance	The Number of Correct Predictions	Experimental Probability
Flip a Coin		
Roll 1 die		
Pick a Card Color		
Pick a Card Suit		
Pick an Exact Card		

10. Are the experimental probabilities different in Questions 7 and 9? Why or why not?

11. How do the theoretical probabilities in Question 7 compare to the experimental probabilities in Question 9? What do you think would happen if even more trials were added?

Assessment Rubric

Group:

Member of The Group							Total
Total Score of Group							
Average Score of Group							
Reward							

Name of the Students	Date : 10 Mei 2010			Date :		
	Quiz : Probability			Quiz :		
	Basic Score	Quiz Score	Development Score	Basic Score	Quiz Score	Development Score

Criteria of Development Score

Criteria of The Score	Development Point

Perfect Score	30 points
If the score more than 10 point of basic score	30 points 20 points
If the score is same as the basic score until 10 point more than basic score	10 points
1-10 point less than the basic score	5 points
>10 points under the basic score	