Assignment No. 2: Lesson Plan

Statistics & Probability

Students will already have had a number of lessons dealing with probability and statistics, and students should know what probability is. Students should understand what mean, median and mode are as well as how to find them. Fractions and ratios would also have been taught in the ear already so prior knowledge should be there for all students. Today they will learn about the difference between theoretical and experimental probability first hand using M & M's to demonstrate.

Duration: 1 hour

Intended Learning Outcome(s):

• use numbers to communicate the probability of single events from experiments and models
• distinguish between the experimental and theoretical probability of single events
• demonstrate that different outcomes may occur when the same experiment is repeated
• compare experimental results with theoretical results

Assessment Strategies:
Math journal reflection at the end of class.

Materials/Preparation:
-Smartboard
-Notebook file: M & M Math
-Computers/Tablets with access to the internet
-Google Docs links
-M & M Statistics Math packet
-Calculators for each student

Orientation: (5 min)
Holding the bag of M & M's ask students if they think every bag of M & M's have the same number of candy in them? Is this fair? Why or Why not?
Do you think every one has the same chance of drawing out their favorite colour of M & M?
Holding a bag of M & M's explain to the class that we will be using candy to determine the difference between experimental and theoretical probability.

Have students predict how this can be done. (Write this in their math notes, then share with their seated partner and 1 partner will share out with the entire class).

Questions:
How does this relate to what we learned last class?
Task: Today we will look at how M & M's relate to theoretical and experimental probability. (Students write down task in their Math Notes)
Tomorrow we will practice applying theoretical and experimental probability.

Elicitation: (5-10 min)
Using Smart learning students will be guided through a series of questions probing their prior knowledge.
Partner Discussion: (Write down what you and your partner agree to be the answer to the following questions.)
  Tell your partner what probability is.
  Tell your partner what theoretical probability is
  Tell your partner what experimental probability is
  What is the difference between theoretical and experimental probability?
  How can we discover what theoretical and experimental probability are?
While students are discussing teacher walks around listening to discussions, stepping in when groups start to get off task, and helping clarify ideas.

Share with class:
   Write down ideas from the entire class on the board, students
   expected to write them down in their math notes as well

Restructuring:
- M & M Activity (Experimental Probability)
  Students open their bags of M & M's and without eating any record the numbers and colours of the bag's contents.
  Each student will now enter data into the google doc form. *(Students may need to be reminded how to log on to computers etc.)*
  Have students compare with their neighbour.
  Answer the following questions:
  Do you and your neighbour have the same probability of picking a blue M & M? What about a brown one? A red one? An orange one? A yellow one? A green one? Why or why not?
- Have students go through the calculations on Part 2 Actual Percentages. Remind students how to find percent, how to represent each number as a fraction and as a ratio. Students will also need to be able to find the mean of each colour. Review this with students.
    Enter this data into the google docs form (teacher will use this data
    to display to the entire class data set to the class)
     While students are working teacher will walk around and
     help students who are struggling, answer questions for those
     students who may have them and ensure that students
     remain on task.
- Have students go through the 3 probability activities in their M & M's packet. This is Part 3 Section A & B including trial 1 & 2.

Was this experimental probability or theoretical probability? Why do you think so?

While students are working teacher will walk around and help students who are struggling, answer questions for those students who may have them and ensure that students remain on task.

Application:

- According to the M & M's website we should find the following:
  Blue – 24%
  Green – 20%
  Orange – 16%
  Yellow – 14%
  Red – 13%
  Brown – 13%

Looking at the class data set:
Did anyone have the same percentages the website showed?
Is the class average (mean) the same as the percentage on the website?
(*Students may need to be reminded how to find mean.*)

Students will then answer the following questions in jot notes in their M & M Math package:
Were the percentages of your M & M package the same as the percentages on the M & M website?
How do you think they came up with these numbers?
What does this do to the probability of your experiments?
Is the probability of your package the same as the probability of your groups package?
Do you think the information from the website is experimental probability or theoretical probability? Why?

Discuss these questions with your group members.

Reflection:
In their math notes have students answer the following questions:
Tell me the most important thing you have learned about experimental and theoretical probability. Why is this the most important?
How does this relate to what we learned about probability yesterday? How do you think this will relate to what we will learn about probability tomorrow?
Journal is the assessment piece today. It will be students ticket out the door.