

CIEM-514

April 27, 2008

Group Members: Susan Carney, Grace Lepore, Teresa Raimo

### Unit Lesson Plan for Probability

Needs Assessment:

Students will use a variety of tools to gain an understanding of probability and how the outcome of probability affects our everyday life.

Goals:

1. An understanding of probability
2. A working knowledge of Excel.
3. Ability to create a spreadsheet and a pie chart
4. Ability to analyze data

Learner Analysis:

This is a third grade class with 20 students. Two students in the class are mainstreamed; there is a teacher's aid to help the classroom teacher with these students.

Instructional Objectives:

Assessment of Student Performance:

**Title for Lesson Plan Number 1:** Understanding Probability

**Grade Level:** 3

**Number of Students:** 18

**Number of Extra Compensation Students:** 2

**Subject/theme/concept/topic:** Math, Probability

**Standards:**

**NJCCCS—Mathematics:**

Standard 4.4—All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.

A. Data Analysis

1. Collect, generate, organize, and display data in response to questions, claims, or curiosity.
2. Read, interpret, construct, analyze, generate questions about, and draw inferences from displays of data.

B. Probability

3. Predict probabilities in a variety of situations (e.g., given the number of items of each color in a bag, what is the probability that an item picked will have a particular color).

Standard 4.5—All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

B. Communication

1. Use communication to organize and clarify mathematical thinking.
3. Analyze and evaluate the mathematical thinking and strategies of others.
4. Use the language of mathematics to express mathematical ideas precisely.

C. Connections

3. Recognize that mathematics is used in a variety of contexts outside of mathematics.

E. Representations

1. Create and use representations to organize, record, and communicate mathematical ideas.

**ALA Information Literacy Standards:**

- 1—The student who is information literate accesses information efficiently and effectively.
- 2—The student who is information literate evaluates information critically and competently.
- 3—The student who is information literate uses information accurately and creatively.

6—The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.

9—the student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.

**Specific Goals:**

1. To predict, record, and discuss outcomes using random drawing experiment.
2. To identify the most likely and least likely outcomes from random drawing experiment.

**Objectives:**

1. The student will be able to define probability
2. The student will be able to predict, record and discuss outcomes from a random drawing
3. The student will be able to identify the most likely and least likely outcomes
4. The student will create a graph and analyze the data

**Required Materials:** Smart Board, weather forecast for the week, sample charts, paper bags for each group of four students, colored blocks (red, yellow, blue) for each group of students, lined paper and graph paper for each group of students.

**Anticipatory Set/Motivating Activity/Lead In:**

1. Define “probability” as the chance that something will happen.
2. Class discussion on real life cases of probability and what decisions are made based upon the chance of the outcome. One example is the weather—what is the probability that it will rain? Should you wear a raincoat and take an umbrella to school?
3. Review data collection and how to graph data. Show sample graphs on Smartboard.

**Step-by-step procedure:**

1. Review the definition of probability
2. Use the weather forecast as an everyday example of probability. Discuss the term “likely,” “most likely,” and “less likely.”
3. Display the weekly weather forecast on the Smartboard. Using the terms “likely,” “most likely,” and “less likely,” discuss the probability that it will rain on each day of the week.
4. Students will be working in groups of 4. Each group will be given a paper bag with 5 colored blocks (two red, two yellow and one blue).
5. Each student will take a block out of the bag five times and record the outcome.
6. Each group will then graph their outcome.

**Closure/Reflect Anticipatory Set:**

1. Class discussion to compare the results of each group.
2. Have students think about different ways they use probability at home.

**Adaptation for students needing compensation:** These students will receive help from their group members.

**Extensions for the gifted:** These students may add extra blocks to their bags.

**Assessment based upon objectives/Evaluation/Rubrics:** The assessment for this lesson will be teacher observation. Throughout the lesson, the teacher will circulate from group to group and observe the activity.

**Title for Lesson Plan Number 2:** Introduction to Excel

**Grade Level:** 3

**Number of Students:** 18

**Number of Extra Compensation Students:** 2

**Subject/theme/concept/topic:** Math, Technology

**Standards:**

**NJCCCS for Mathematics:**

Standard 4.4—All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.

A. Data Analysis

3. Collect, generate, organize, and display data in response to questions, claims, or curiosity.
4. Read, interpret, construct, analyze, generate questions about, and draw inferences from displays of data.

Standard 4.5—All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

B. Communication

1. Use communication to organize and clarify mathematical thinking.
3. Analyze and evaluate the mathematical thinking and strategies of others.
4. Use the language of mathematics to express mathematical ideas precisely.

C. Connections

3. Recognize that mathematics is used in a variety of contexts outside of mathematics.

E. Representations

1. Create and use representations to organize, record, and communicate mathematical ideas.

F. Technology

1. Use technology to gather, analyze, and communicate mathematical information
2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information

**NJCCCS for Technological Literacy**

Standard 8.1—All students will use computer applications to gather and organize information and to solve problems.

A. Basic Computer Skills and Tools

1. Use basic technology vocabulary
2. Use basic feature of an operating system

3. Input and access text and data, using appropriate keyboarding techniques or their input devices.
5. Produce and interpret a simple graph or chart by entering and editing data on a prepared spreadsheet template.
9. Use basic computer icons.

**NETS Standards:**

- 1—Creativity and Innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
- 3—Research and Information Fluency: Student apply digital tools to gather, evaluate, and use information.
- 4—Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems and make informed decisions using appropriate digital tools and resources.
- 6—Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems, and operations.

**ALA Information Literacy Standards:**

- 1—The student who is information literate accesses information efficiently and effectively.
- 2—The student who is information literate evaluates information critically and competently.
- 3—The student who is information literate uses information accurately and creatively.
- 6—The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.
- 8—The student who contributes positively to the learning community and to society is information literate and practices ethical behavior in regard to information and information technology.
- 9—the student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.

**General Goals:** To assist a third grade teacher in designing and using a lesson on creating a spreadsheet and graphing using Excel.

**Specific Objectives:**

1. Students will be able to create a spreadsheet in Excel.
2. Students will be able to create a graph in Excel.
3. Students will be able analyze a graph and form an opinion based upon data.

**Required Materials:** Smart Board, PowerPoint presentation for lesson 2, student computers, large bag of M&M's.

**Anticipatory Set/Motivating Activity/Lead In:** Students will have knowledge of creating graphs on paper and the ability to use the keyboard and mouse to enter data into a computer.

**Step-by-step procedure:**

1. Review the concept of graphing.
2. Discuss the benefits of using technology to organize data and create graphs.
3. The SLMS will use a PowerPoint presentation on the Smart Board to assist teaching the class about Excel.
4. A large size bag of M&M's will be sorted by color.
5. Students will follow along at individual computers and create a class spreadsheet and pie graph based upon the colors and amounts of M&M's found in the bag.

**Closure/Reflect Anticipatory Set:** Students will discuss the benefits of using technology in the creation of graphs.

**Adaptation for students needing compensation:** These students will receive individualized attention during the lesson from classroom aides. If extra time is still needed, these students may come to the media center for extra help.

**Extensions for the gifted:** After creating their spreadsheet and pie graph, these students can start brainstorming new ideas for topics that could be graphed and analyzed in Excel.

**Assessment based upon objectives/Evaluation/Rubrics:** Rubric for Lesson 2

**Title for Lesson Plan Number 3:** Creating a Spreadsheet and Graph in Excel

**Grade Level:** 3

**Number of Students:** 18

**Number of Extra Compensation Students:** 2

**Subject/theme/concept/topic:** Math, Technology

**Standards:**

**NJCCCS for Mathematics:**

Standard 4.4—All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.

A. Data Analysis

5. Collect, generate, organize, and display data in response to questions, claims, or curiosity.
6. Read, interpret, construct, analyze, generate questions about, and draw inferences from displays of data.

Standard 4.5—All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

B. Communication

1. Use communication to organize and clarify mathematical thinking.
3. Analyze and evaluate the mathematical thinking and strategies of others.
4. Use the language of mathematics to express mathematical ideas precisely.

C. Connections

3. Recognize that mathematics is used in a variety of contexts outside of mathematics.

E. Representations

1. Create and use representations to organize, record, and communicate mathematical ideas.

F. Technology

1. Use technology to gather, analyze, and communicate mathematical information
2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information

**NJCCCS for Technological Literacy**

Standard 8.1—All students will use computer applications to gather and organize information and to solve problems.

A. Basic Computer Skills and Tools

1. Use basic technology vocabulary

2. Use basic feature of an operating system
3. Input and access text and data, using appropriate keyboarding techniques or their input devices.
5. Produce and interpret a simple graph or chart by entering and editing data on a prepared spreadsheet template.
9. Use basic computer icons.

**NETS Standards:**

- 1—Creativity and Innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
- 3—Research and Information Fluency: Student apply digital tools to gather, evaluate, and use information.
- 4—Critical Thinking, Problem Solving, and Decision Making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems and make informed decisions using appropriate digital tools and resources.
- 6—Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems, and operations.

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**General Goals:** To assist a third grade teacher in designing and using a lesson on creating a spreadsheet and graphing using Excel.

**Specific Objectives:**

1. Students will be able to create a spreadsheet in Excel.
2. Students will be able to create a graph in Excel.
3. Students will be able analyze a graph and form an opinion based upon data.

**Required Materials:** Smart Board, PowerPoint presentation for lesson 3, student computers, fun size bag of M&M's for each student.

**Anticipatory Set/Motivating Activity/Lead In:** Students will have knowledge of creating spreadsheets and graphs in Excel.

**Step-by-step procedure:**

1. Review the benefits of using technology to organize and analyze data.
2. The SLMS will use a PowerPoint presentation on the Smart Board to reinforce Excel concepts from the previous class and to model the assignment for this class.
3. Each student will receive a fun size bag of M&M's.
4. Students will sort M&M's by color.
5. Students will create individual spreadsheets and pie graphs based upon the colors and amounts of M&M's found in the bag.

**Closure/Reflect Anticipatory Set:** Students will discuss and compare graphs with classmates.

**Adaptation for students needing compensation:** These students will receive individualized attention during the lesson from the classroom teacher, SLMS, and classroom aides. If extra time is still needed, these students may come to the media center for extra help.

**Extensions for the gifted:** After creating their spreadsheet and pie graph, these students can start create another spreadsheet and graph from previously collected data.

**Assessment based upon objectives/Evaluation/Rubrics:** Rubric for Lesson 2

**Title for Lesson Plan Number 4:** Probability Follow Up

**Grade Level:** 3

**Number of Students:** 18

**Number of Extra Compensation Students:** 2

**Subject/theme/concept/topic:** Math, Probability

**Standards:**

**NJCCCS—Mathematics:**

Standard 4.4—All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.

A. Data Analysis

7. Read, interpret, construct, analyze, generate questions about, and draw inferences from displays of data.

B. Probability

3. Predict probabilities in a variety of situations (e.g., given the number of items of each color in a bag, what is the probability that an item picked will have a particular color).

Standard 4.5—All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

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1. Use communication to organize and clarify mathematical thinking.
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6—The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.

9—the student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.

**Specific Goals:**

1. To apply probability concepts
2. To discuss and analyze computer generated graphs.

**Objective:** The student will be able to apply the concept of probability to a real life situation.

**Required Materials:** Excel spreadsheet and graphs created in Lesson 3, fun size bag of M&M's, Smartboard.

**Anticipatory Set/Motivating Activity/Lead In:**

1. Review “probability” as the chance that something will happen.

**Step-by-step procedure:**

1. On a piece of paper, have students guess how many of each color M&M's will be in the fun size bag.
2. The teacher will open the bag and sort the colors.
3. A tally will be made on the Smartboard.
4. Class discussion on the probability of getting a certain outcome of colors in a bag of M&M's.

**Closure/Reflect Anticipatory Set:**

Use this time to introduce the terminology: mean, median and mode.

**Assessment based upon objectives/Evaluation/Rubrics:** Teacher observation