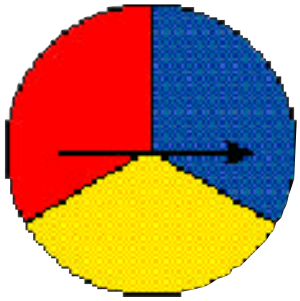
Probability Activities

Third Grade

2001-2002



Andy Clark

Grade Level: **Third** Weeks **1** Unit: **3- Probability (Supplemental Unit** **Feb. or March**

PPS Daily Math Plans

Day 01	Day 02	Day 03	Day 04	Day 05
Calendar Update All Discuss: Comp & Con, Depositor, Measurement See Sample Disc. for Comp & Con	**Calendar** Update All Discuss: Counting Tape, Coin Ctr Practice counting by 4's using the Counting Tape.	**Calendar** Update All Discuss: Comp & Con, Depositor Use the depositor for practice with rounding and place value.	**Calendar** Update All Discuss: Calendar, Coin Counter, Measurement Discuss patterns on the calendar	**Calendar** Update All Discuss: Calendar, Coin Counter, Measurement Discuss patterns on the calendar
Lessons Probability Lesson 1 1-2 and 1-2-3 Spinner. Students work with a partner to answer the question: is any number more likely to occur and why?	**Lessons** Probability Lesson 2 1-2 and 1-2-3 Spinner. Students finish collecting data for two spinners and create class chart of results. How close is each individual chart to the class total?	**Lessons** Probability Lesson 3 Roll a number cube. Partners roll a 1-6 number cube 20 times and record results to answer the question: Are you more likely to roll an even number or an odd?	**Lessons** Probability Lesson 4 Half the class plays Two Dice Sum and the other half plays Red Tile in a Bag. After 20 minutes switch. Leave 10 minutes at the end to discuss what students learned.	**Lessons** Probability Lesson 5 Catch-up or Collect the data from each pair of students and make a class chart of the data from Red Tile in Bag and Two Dice Sum. Discuss idea of chances. Try some other combinations of colored tiles.
10 Minute Math Estimate $5.13 + $6.50 + $3.15	**10 Minute Math** Calculate mentally 300 - 159 = $5.00 - $2.35 =	**10 Minute Math** Which of these would round to 400, if rounding to the nearest 10? 391 395 404 405	**10 Minute Math** Calculate: 10 x 5, 10 x 50, 100 x 5, 100 x 50, 10 x 15, 10 x 150, 10 x 1500	**10 Minute Math** Calculate: 10 x 5, 10 x 50, 100 x 5, 100 x 50, 10 x 15, 10 x 150, 10 x 1500
Homework Daily Cumulative Review p. 55 Encourage students to find 4 they can do mentally.	**Homework** Daily Cumulative Review p. 56 Review rounding.	**Homework** Extend Your Thinking p. 51 (patterns: perhaps do #9 in class)	**Homework**	**Homework**
Support Material **Probability Support Packet**	**Support Material** Probability Packet	**Support Material** Again collect the class data and discuss the results	**Support Material** Probability Packet	**Support Material** Probability Packet
Notes: This week is a good time to include some activities in probability and to check for student skills.	**Notes:** As students finish their experiments, have them include the data on a class chart. Discuss the difference between one trial, 10 trials, and many trials.	**Notes:** Use the Every Day Counts counting tape to review rounding.	**Notes:** Review probability concepts: probability of an event, experimental probability chances, likelihood, likely	**Notes:** Review probability concepts: probability of an event, experimental probability chances, likelihood

1-2 SPINNER ACTIVITY

OVERVIEW

In this activity, students will:

- predict possible outcomes
- collect and record data
- organize, describe and interpret data
- compare data with larger class samples
- explore concepts of more likely/less likely

MATERIALS

Spinners, (with paper clip), and recording sheets.

OPENING

Ask: "When you spin the spinner, which number is more likely to come up?" "Why do you think so?" If you spin it ten times, how many times will "1" come up? Always?

Explain how to keep track of spins on a graph recording sheet that is 2 squares by 12 squares. Demonstrate for the class how to spin and record on the graph.(Use a pencil with a paper clip for the spinner.) After 3 or 4 spins, ask: "What do you think the graph will look like when one number reaches the top of the graph?"

QUESTIONS:

Which number came up more often?
How much more often? Was there a big difference?
Did everyone in the class get the same results?

SEQUENCE OF LESSONS

Each pair of students needs to complete the experiment, stopping when one of the numbers reaches the top of the graph. Students should post their results on a chart with sections labeled 1 and 2.

SHARING OF THINKING

1. Discuss the class results. What affects the outcome of the results? What would happen if we repeated this experiment?

2. Did every pair of students get the same result? Why?

3. In general, when you collect everyone's data, how many times does "1" come up and how many times does "2 "come up?

4. What is the probability of getting a 1 or 2? What does "probability" mean? (The theoretical probability is 1 out of 2 for either number, but the experimental results may not be exactly 1/2.) Help students record the probability as 1 out of 2, 50/50, 50 percent chance, even chance of 1 or 2, equal chance of 1 or 2, a 1/2 chance of either 1 or 2.

5. If the spinner came up 1 on the first spin, what is the probability that it will be a 1 on the next spin? (The spinner doesn't remember what happened the time before. It is always a 1 out of 2 chance. Remember this is a difficult concept that most adults don't fully understand.)

1-2-3 SPINNER ACTIVITY

Repeat the same sequence with the 1-2-3 spinner.

SHARING OF THINKING

1. Discuss the class results. How does it differ from the 1-2 spinner?

2. Did every pair of students get the same result? Why?

3. Which number occurred most often? Why? (While 3 was probably the number that occurred most frequently, there will be instances of 1 or 2 as most frequent. Discuss why this happens.) In how many experiments did 3 appear most often? Why?

4. What order did the numbers appear in? Did it go 3,1,3,2 or was it random? Was there any order? Why?

5. Based on the class results, how often do you predict the 3 will occur? What fraction of the times did 3 occur in the whole class? What fraction did 1 occur? 2?

The difference between theoretical probability – the fraction of desirable outcomes to total outcomes – and experimental probability is a very sophisticated concept. These experiments are designed to develop intuitions about the relationship.

Help students record the probability of spinning a 3 as 2 out of 4, 1 out of 2, 50%, 1/2 chance. You may want to show that the half circle marked as 3 can also be divided into 2 quarters, so there are 2 out of 4 chances of spinning a 3.

What is the probability of rolling a 1 or 2? (1/4 or 1 out of 4)
Help students understand why the probability is NOT 1 out of 3!

ROLL A NUMBER CUBE

OVERVIEW

In this activity, students will:

- predict possible outcomes
- collect and record data
- organize, describe and interpret data
- compare data with larger class samples
- explore concepts of more like/less likely
- compare theoretical probability with experimental probability

MATERIALS

Number cube and recording sheet.

OPENING

Ask: "When you roll a number cube or die, what number is most likely to occur?" Why? (Don't tell students yet, that each number is as likely as any other, and that each has a 1/6 chance of occurring.)

Explain that a pair of students will roll the number cube 20 times and record the number that appears. The question we are trying to answer is whether more even or more odd numbers will occur.
Ask students whether they think they can predict which numbers will appear most frequently and why.

QUESTIONS:

Did more evens or more odds occur?
Was there a big difference?
What number came up most often?
Did everyone in the class get the same results?
How many even numbers are there on the number cube and how many odd ones?

SEQUENCE OF LESSONS

Each pair of students needs to complete the experiment, stopping when they have rolled the die 20 times. Students should post their results on a chart with sections labeled even and odd.

SHARING OF THINKING

1. Discuss the class results. Did more even numbers occur or more odds? Since there are 3 odd numbers and 3 even numbers, what do you expect to occur? What affects the outcome of the results?

2. Did every pair of students get the same result? Why?

3. In general, when you collect everyone's data, how many times does even occur and how many times does odd occur?

4. What is the probability of getting an even? What does "probability" mean? (The theoretical probability is 1 out of 2, but the experimental results may not be exactly 1/2.) Help students record the probability as 1 out of 2, 3 out of 6
   3/6, 50/50, 50 percent chance, even chance, equal chance, a 1/2 chance.

5. If the number cube came up 3 evens in a row, what is the chance on the next roll that it will be even? (Still 1/2).

RED TILE IN A BAG

MATERIALS

Colored tiles, brown bag and recording sheet. Put 1 red and 3 blue tiles in a bag.

OPENING

Tell students you have four tiles in the bag, one red and three blue. Ask, if you shake the bag and don't look, what color are you more likely to draw, red or blue? Why?

Explain that each pair of students will put one red and three blue tiles in a bag, and then without looking will take a tile out and record if it is red or blue before returning it to the bag. Do this 20 times.

QUESTIONS:

Did you get more red or blue? Why?
Was there a big difference? How much more?
Did everyone in the class get the same results?
If you added up all the reds and all the blues in the class, about how many times more did you get blue?

SEQUENCE OF LESSONS

Each pair of students needs to complete the experiment, stopping when they have done the experiment 20 times. Students should post their results on a chart with sections labeled red and blue.

SHARING OF THINKING

1. Discuss the class results. How many more times did blue occur?

2. Did every pair of students get the same result? Why?

3. What is the probability of getting a red? What does “probability” mean? (The theoretical probability is 1 out of 4, but the experimental results may not be exactly 1/4.) Help students record the probability as 1 out of 4, 1/4, 25/100, 25 percent chance. What is the probability of getting a blue? (3/4, 3 out of 4, 75% etc.)

4. What if you didn't replace the tiles and drew 2 blues. On the next draw, what are the chances of getting a red? (1/2).

5. Try the same experiment with 2 red and 6 blue and see what the results are. Are they the same as 1/4? Why?

6. Try some different combinations of red and blue and record your results.

Odd or Even

Prediction: more odds or more evens? _____

odd	**even**

Odd or Even

Prediction: more odds or more evens? _____

odd	**even**

Odd or Even

Prediction: more odds or more evens? _____

odd	**even**

Odd or Even

Prediction: more odds or more evens? _____

odd	**even**