

# Probability Sample Space – Fundamental Counting Principle – A Co-Teaching Lesson Plan

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## Co-Teaching Approaches

A “(Y)” in front of the following list items indicates the approach is outlined in the lesson. An “(N)” in front of the following list items indicates the approach is not outlined in the lesson.

- (Y) Parallel Teaching
- (N) Station Teaching
- (N) Alternative Teaching
- (Y) Team Teaching
- (N) One Teach/One Observe
- (N) One Teach/One Assist

## Subject

Grade 5 Mathematics

## Strand

Probability and Statistics

## Topic

Making predictions and determining the probability of outcomes

## SOL

5.15 The student will determine the probability of an outcome by constructing a sample space or using the Fundamental (Basic) Counting Principle.

## Outcomes

Students will be able to make predictions, create a sample space, determine the probability of an outcome based on the sample space, and figure the probability through the use of the Fundamental Counting Principle.

## Materials

- Paper bags
- colored tiles
- scissors and tape
- crayons or colored pencils

- Pencil activity sheet (attached; two sheets per student pair)
- Choices in Outfits activity sheet (attached)

## Vocabulary

*chance, data, experiment, outcome, prediction, sample space, tree diagram*

## Co-Teacher Actions

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
Anticipatory Set	Team Teaching	<p><b>Activating Prior Knowledge</b></p> <p>Generate class discussion by asking:</p> <ol style="list-style-type: none"> <li>1. “What is probability?” Lead a class discussion to find the answer.</li> <li>4. Display on the board a bag filled with colored square tiles or marbles: three red, four yellow, five blue, and one green. Ask students in pairs to discuss and answer:  “What is the probability of drawing a red tile/marble from this bag? A yellow tile/marble? A blue tile/marble? A green tile/marble? Be ready to explain your thinking to the class.”</li> </ol>	<ol style="list-style-type: none"> <li>2. Find the definition as, “The chance of an event occurring.”</li> <li>3. “Students will find their partners and think-pair-share to list situations that involve probability.</li> </ol> <p>Monitor the student discussions, listening for language used, misconceptions, and solution strategies. Select several students to share their thinking and solution strategy with the class.</p>

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		<p>Monitor the student discussions, listening for language used, misconceptions, and solution strategies. Select several students to share their thinking and solution strategy with the class.</p> <p>Ask the class to compare and contrast the different strategies and thinking processes.</p>	
<b>Lesson Activities/ Procedures</b>	Team Teaching	<p>Distribute the Pencil activity sheets and scissors.</p> <p>The scenario: Pencils come in a pack consisting of red, green, yellow, and maroon pencils with orange, pink, or blue erasers; and gold or silver bands.</p> <p>Your problem:</p> <p>If you reached into the pack without looking, what is the probability that you would get a red pencil with a silver band and orange eraser? What is the probability you would get a red pencil? What is the probability that you would get a red pencil with a pink eraser? Work together with your partner to determine these probabilities.</p>	
<b>Guided/ Independent Practice</b>	Parallel Teaching	Monitor the students as they work, listening for their strategies, asking the “Why?” and “How do you know?” questions and watching for	Same as GE.

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		misunderstandings. Select several students to share their thinking and solution strategies with the class.	
<b>Closure</b>	Team Teaching	<p>Have selected students share their thinking and solution strategies for figuring out how many possibilities there are – grouping strategies, drawings, tree diagram. If the tree diagram does not come from students, ask questions about organizing the information, and facilitate the construction of a tree diagram with students.</p> <p>Ask questions to help students to see the numbers that resulted in the tree diagram. Facilitate this discussion to assist students to see that the final number of possibilities is the product of the individual components: number of pencil colors x number of eraser colors x number of band colors.</p> <p><math>4 \times 3 \times 2 = 24</math> different possible pencils.</p>	Record the student reasoning. Ask students questions about what the student presenting is describing. Make sure all students follow the strategies.
<b>Formative Assessment Strategies</b>	Team Teaching	<p><b>Exit Slip</b></p> <p>Thoroughly explain through pictures and writing the probability of randomly getting a yellow pencil with a gold band and a blue eraser.</p>	<p><b>Exit Slip</b></p> <p>Read the exit slip to all students.</p>
<b>Homework</b>		Choices in Outfits activity sheet	

## **Specially Designed Instruction**

- The vocabulary LINCing routine could be used with students as a specialized instruction/review device. While not used directly in this lesson, it could be used with a small group of students during the lesson, or following the lesson for review and remediation.
- Begin the lesson with fewer pencils and choices
- Use actual pencils to manipulate rather than drawings.

## **Accommodations**

- Prompting of students during the whole-group process
- Vocabulary chart for reference on students' desks.
- Provide previously colored sections to tape together for the colored pencils, bands, and erasers
- Allow multiple ways of responding to exit ticket

## **Modifications**

- For those students who require a modified curriculum, the content could be modified to finding the probability of one event or identifying fractional parts of a set model.

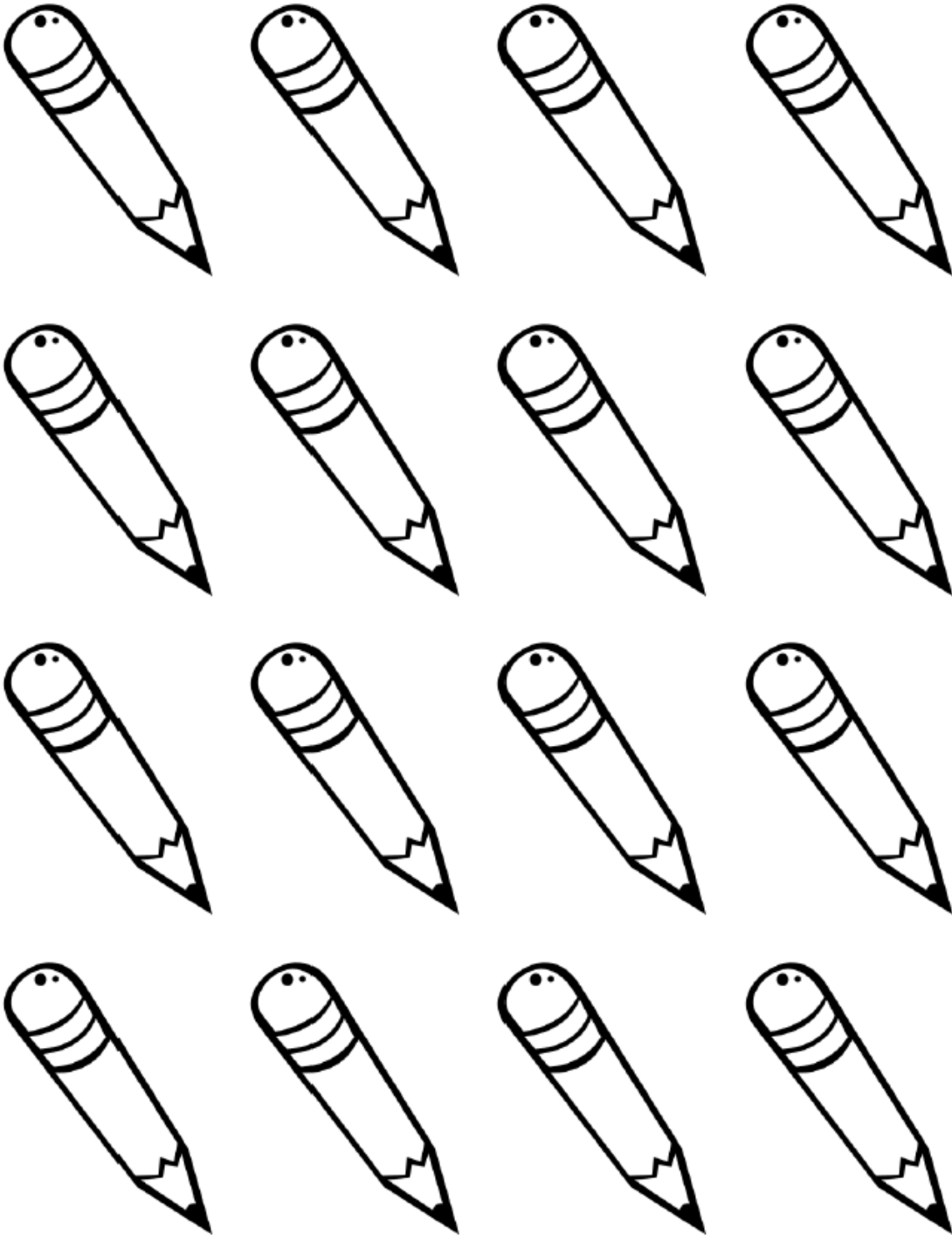
## **Notes**

- “Special educator” as noted in this lesson plan might be an EL teacher, speech pathologist, or other specialist co-teaching with a general educator.
- The co-teachers who developed this lesson plan received required professional development in the use specialized instruction techniques which combine an explicit instructional routine with the co-construction with the frame helps to develop understanding of information and procedures by associating main ideas and details. These content enhancement routines were developed at the [Center for Research on Learning at the University of Kansas](#).
- Other graphic organizers should be used by teachers who have not received professional development in these routines. If Virginia teachers would like to learn content enhancement routines, contact your regional TTAC.

**Note: The following pages are intended for classroom use for students as a visual aid to learning.**

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# Pencil Activity Sheet



## Choices in Outfits

Name: \_\_\_\_\_ Date: \_\_\_\_\_

The baby has:

- 3 different shirts – blue stripe, red, yellow
- 3 pairs of pants – blue jeans, khaki, grey
- 2 colors of socks – white, grey

Draw a picture, create a tree diagram, and use these to determine:

1. The number of possible outfits for the baby \_\_\_\_\_
  
2. The probability of the baby wearing a red shirt  
with grey pants and grey socks \_\_\_\_\_
  
3. The probability of the baby wearing a red shirt \_\_\_\_\_
  
4. The probability of the baby wearing a yellow shirt with blue jeans \_\_\_\_\_
  
5. The probability of the baby wearing white socks \_\_\_\_\_
  
6. The probability of the baby wearing a yellow shirt with black pants \_\_\_\_\_