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How to Use This Addenda

Make sure you're ready to teach by noting the **Necessary Materials and Pre-Lesson Prep** you will need to gather or complete prior to the lesson

Find high-leverage instructional moves in the **Lesson Look Fors**. This is what leaders

should see when observing your instruction

Note how your lesson objective ties to your state **Standards**

Plan purposeful questioning and responses using **Opportunities to CFU**

Plan to stress **Important Vocabulary** in the lesson. New vocab for the unit is indicated in bold

Note exemplar pacing in the **Lesson Agenda**

Use the **Mathematical Goal of the Lesson** to keep you focused on the appropriate student outcome

Plan instruction around what students need to Know & Do to be successful on the Exit Ticket using the identified **Student Criteria for Success**

Lesson 9: Find related multiplication facts by adding and subtracting equal groups in array models Date: _____

Standard(s)
3.4K solve one-step and two-step problems involving multiplication and division within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- (S) Multiply by 2 (1–5) Pattern Sheet
- (S) Personal white board
- (S) Three's array no fill template
- (S) Blank paper

Lesson Agenda		Time
I.	Do Now (source: fluency #1)	5 min
II.	Fluency*	8 min
III.	Concept Development	25 min
IV.	Student Practice	15 min
V.	Student Debrief	7 min
VI.	Exit Ticket*	5 min

Mathematical Goal of this Lesson
Students learn they can use decomposition to break one larger number into two smaller numbers as a strategy for multiplication. The goal of this lesson is simply for student to understand how to interpret and create an array that demonstrates such decomposition. Students will build on this understanding in subsequent lessons. This lesson also supports the goal of student thinking in terms of counting units, an overarching goal for academy math.

Opportunities to CFU

- ✓ Concept Development, by way of eliciting student responses
- ✓ Problems Set problems: #2, #3

Other Notes to Inform Your Planning

For **Do Now**: Use the Multiply by 2 (1–5) Pattern Sheet for your Do Now. 3 minutes for completion, 2 minutes whole group classwork check.

For **Fluency**: Complete the Group Counting activity (notice the inclusion of 4s in preparation for upcoming lessons) and Forms of Multiplication activity.

For **Concept Development**: Consider prepping personal whiteboard in advance. Spend no more than 12 minutes for CD Problem 1 and 13 minutes for CD Prob 2.

For **Student Practice**: consider creating an extra set of Qs like 1-3 in case students struggle with entry-level understanding. If they don't, move on to Qs 4 and above.

For **Student Debrief**: consider using the Eureka assigned Exit Ticket for whole group debrief exercise; Suggested strategy – guided discourse.

For **Exit Ticket**: Use **Homework** problems 2 & 3 for this lesson's Exit Ticket.

Though not formally discussed yet, this is a foundation to understanding of distributive property. Students visually see multiplying the sum of two or more addends by a number will give the same result as multiplying each addend individually by the number and then adding the products together.

Lesson Look Fors

Look for teachers to...

- Have established a signalling routine for choral response or work show during the respective fluency activities
- Use a think aloud to describe why they shade what portions of the array, or use a different symbol in the array
- Make the focus of the lesson understanding the visual representations

Look for students to...

- Explain what they see in the array and how it relates to a given number sentence.

Student Criteria for Success

- Shading, brackets, and/or dotted lines on an array will have mathematical significance
- brackets can identify parts or wholes
- dotted lines and shading represent decompositions
- We count units; in an array, counting rows is the same as counting units.
- Addition/subtraction and multiplication math facts (up to 4)
- Interpret an array
- identify decompositions within an array
- Relate an annotated or labeled array to one or more number sentences
- Addition/subtraction (+/- up to 4)
- Multiplication (2, 3, and 4)

Important Vocabulary

- array
- bracket
- columns
- rows
- unit(s)

In this lesson, students are NOT responsible for the vocabulary distributive property. Please withhold as it will come up in later lessons.

Find recommended lesson modifications, content knowledge boosters, and/or high-leverage instructional moves that may not be in your Teacher Edition located in **Other Notes to Inform Your Planning**

UNIT SYNOPSIS

This sequence introduces students to probability for the first time. They begin by describing the likelihood of single events using fractions, decimals, and percents, and by classifying outcomes along a probability number line. Students then explore experimental probability through hands-on activities such as coin tosses, dice rolls, and mystery box trials, learning to record data, calculate probabilities, and use proportional reasoning to make predictions.

Next, students move into theoretical probability, determining what should happen based on the ratio of favorable to possible outcomes. Lessons then connect the two ideas, asking students to compare experimental results with theoretical expectations. From there, the work extends to compound probability, where students use tables, lists, and tree diagrams to represent all possible outcomes and calculate probabilities of two or more events. Finally, students distinguish between independent and dependent events, applying both reasoning and models to calculate probabilities in different contexts.

Key strategies and models include:

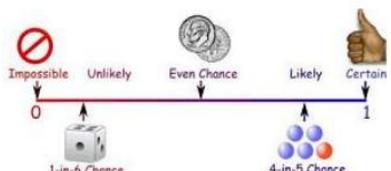
- Using number lines, fractions, decimals, and percents to describe the likelihood of events.
- Collecting and organizing real data to calculate experimental probability.
- Applying proportional reasoning to make predictions from experiments.
- Using probability tables, lists, and tree diagrams to model compound events.
- Distinguishing between independent and dependent events through examples and guided questioning.
- Comparing experimental and theoretical results to build conceptual understanding.

By the end, students understand probability as a measure of likelihood, can model and calculate both simple and compound probabilities, and are prepared for future work with permutations, combinations, and conditional probability.

Topic A Overview – Experimental and Theoretical Probability

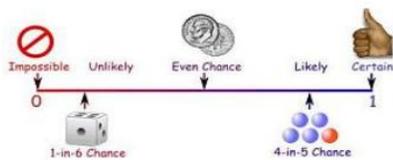
In Topic A, Lesson 1, students to describe the likelihood of an event based on it probability expressed as a fraction, decimal or percent. They will learn about classifying events as impossible, unlikely, as likely as not, likely, and certain. They will also learn that some events are extremely unlikely, but no impossible and other events are extremely likely but not certain. In Lesson 2, students calculate the experimental probability of an event and express it as a fraction, decimal or percent. They will build an understanding that experimental probability is found by performing an experiment and recording the results. In Lesson 3, students calculate the theoretical probability of an event as a fraction, decimal and percent. They will also use theoretical probability to make predictions about a bigger population. This lesson will build on what students learned yesterday about experimental probability. In Lesson 4, students to compare experimental and theoretical probabilities.

Lesson 1



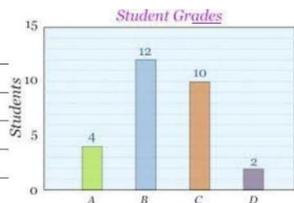
As Likely to Occur as not: 50% , $\frac{1}{2}$, 0.5
 Less Likely to Occur: 0% – 50%
 More Likely to Occur: 50% – 100%
 Impossible: 0% Certain: 100%

Lesson 6



As Likely to Occur as not: 50% , $\frac{1}{2}$, 0.5
 Less Likely to Occur: 0% – 50%
 More Likely to Occur: 50% – 100%
 Impossible: 0% Certain: 100%

- A student earned a "C" in the class: $\frac{10}{28} = \frac{5}{14} \approx 0.357 \approx 35.7\%$
- A student earned a "B" or better: $\frac{16}{28} = \frac{4}{7} \approx 0.571 \approx 57.1\%$
- A student earned an "A" in the class: $\frac{4}{28} = \frac{1}{7} \approx 0.142 \approx 14.2\%$
- A student earned a "C" or lower: $\frac{18}{28} \approx 0.642 \approx 64.2\%$
- A student did not earn an "A": $\frac{24}{28} = \frac{6}{7} \approx 0.857 \approx 85.7\%$



Lesson 3

Complete guided notes with students

The theoretical Probability of an event is the ratio of the number of ways the event can occur to the total number of equally likely outcomes.

$$\text{Theoretical Probability} = \frac{\text{Number of Ways the Event Occurs}}{\text{Total Number of Equally Likely Outcomes}}$$

When the outcomes in the sample space of an experiment have the same chance of occurring, the outcomes are said to be equally likely. An experiment in which all outcomes are equally likely is said to be fair. You can usually assume that experiments involving coins and number cubes (dice) are fair.

Lesson 4

Let's Experiment!

- If you flip a coin 2 times what "should" happen? *you should get head once & tails once*
 Flip a coin 2 times. What "did" happen? *answer will vary*
- If you flip a coin 20 times, what "should" happen? *theoretically, you should get heads 10 times & tails 10 times*
 Flip a coin 20 times. Record your results using tallies in the table.

Heads	Tails
<i>HT HT</i>	<i>HT HT HT</i>
<i>Recording will vary</i>	

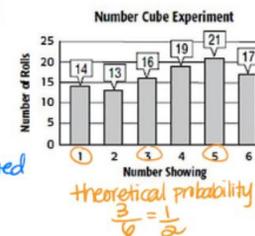
How did what you expect to happen compare to what actually happened? *answers will vary*
ex: 1 flipped tails 3 times more than expected
1 flipped heads 3 times less than expected

- The bar graph shows the results of rolling a number cube 100 times. What is the experimental probability of rolling an odd number? How does this compare with the theoretical probability of rolling an odd number?

$14 + 16 + 21 = 51$ Experimental probability is $\frac{51}{100}$

Theoretical probability = $\frac{1 \times 50}{2 \times 100} = \frac{50}{100}$

In the experiment, rolling an odd number happened one more time than expected.



Topic B Overview – Compound Probability

In Topic B, Lesson 5, students calculate compound probability using models and the algorithm. Students will discover the procedure for finding the probability of compound events using models such as probability tables and tree diagrams. In Lesson 6, students will differentiate independent and dependent events in probability and calculate compound probability involving independent events as well as dependent events. They will discover the difference between independent and dependent events. In Lesson 7, students will calculate the probability of compound events requiring a model. This lesson is similar to Lesson 6 and can be considered an extension and review.

Lesson 5

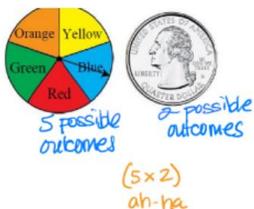
Task 1: Matt flipped a coin and spun the spinner below.

How many possible outcomes could he get?

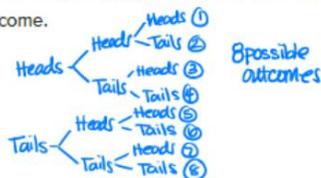
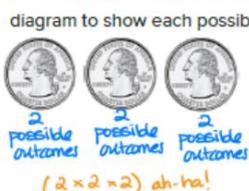
Draw a diagram to show each possible outcome.

	Red	Orange	Yellow	Green	Blue
Heads	HR	HO	HY	HG	HB
Tails	TR	TO	TY	TG	TB

10 possible outcomes



Task 2: Nathalie flips a coin three times. How many possible outcomes could she have gotten? Draw a diagram to show each possible outcome.



Lesson 6

② A bowl of fruit is on the kitchen table. It contains 5 apples, 2 oranges, and 2 bananas. Christian and Aaron come home from school and randomly grab one fruit each. What is the probability that both grab oranges?

dependent events

$$\frac{2}{9} \times \frac{1}{8} = \frac{1}{36}$$

③ Michael flips a coin and rolls a number cube. Find the probability that he flips "heads" and rolls a "6".

independent events

$$\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$$

CONTENT STANDARDS

Below are the standards addressed in this unit.

Readiness Standards	Supporting Standards
◆ 7.6(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces	◆ 7.6(A) represent sample spaces for simple and compound events using lists and tree diagrams ◆ 7.6(C) make predictions and determine solutions using experimental data for simple and compound events ◆ 7.6(D) Make predictions and determine solutions using theoretical probability for simple and compound events

Focus on Disciplinary Literacy	Mathematical Process Standard (F) – analyze mathematical relationships to connect and communicate mathematical ideas
	Mathematical Process Standard (G) – display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

ROADMAP

AT A GLANCE: Unit 9 - Probability				
Topic	Day	Date	Lesson	Lesson Title
Topic A Experimental and Theoretical Probability	1		1	Introduction to Probability
	2		2	Experimental Probability
	3		3	Theoretical Probability
	4		4	Experimental Vs. Theoretical
Topic B Compound Probability	5		5	Introduction to Compound Probability
	6		6	Independent Vs. Dependent Events
	7		7	Compound Probability
	8			Unit Exam 9
	9			Data Day

Lesson 1: Introduction to Probability		Date: _____												
Standard(s)	Notes for Intellectual Preparation & Lesson Planning													
<p>◆ 7.6(A) represent sample spaces for simple and compound events using lists and tree diagrams</p> <p>◆ 7.6(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces</p>	<p>Necessary Materials and Pre-Lesson Prep</p> <ul style="list-style-type: none"> ▪ Unit 9 Student Workbook ▪ Document Camera ▪ Dice/Number Cube ▪ Coins (1 penny per student, recommended) <p>Lesson Agenda</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 20%; text-align: center;">Time</th> </tr> </thead> <tbody> <tr> <td>I. Do Now</td> <td style="text-align: center;">8 min</td> </tr> <tr> <td>II. INM/Concept Development</td> <td style="text-align: center;">35 min</td> </tr> <tr> <td>III. Student Practice</td> <td style="text-align: center;">15 min</td> </tr> <tr> <td>IV. Student Debrief</td> <td style="text-align: center;">5 min</td> </tr> <tr> <td>V. Exit Ticket</td> <td style="text-align: center;">7 min</td> </tr> </tbody> </table> <p>Mathematical Goal of this Lesson The primary goal of this lesson is for students to describe the likelihood of an event based on its probability expressed as a fraction, decimal or percent. They will learn about classifying events as impossible, unlikely, as likely as not, likely, and certain. They will also learn that some events are extremely unlikely, but no impossible and other events are extremely likely but not certain.</p> <p>Opportunities to CFU</p> <ul style="list-style-type: none"> ✓ INM: Task 1, Task 2 ✓ Student Practice: #2, 5 <p>Other Notes to Inform Your Planning For Do Now: The Do Now Exploration/Inquiry based. It is a Must Do as it prepares students for the day's lesson and activates prior knowledge.</p> <p>For INM: Consider allowing students access to a calculator given the focus of the lesson is less on computation and more on the interpretation of the calculated results. Alternatively, you can post an anchor chart in your room with high frequency/benchmark fraction ↔ decimal conversions. Students may need to be reminded of what factors, multiples and composite numbers are.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center; background-color: #fff9c4; margin: 0;">Focus on Disciplinary Literacy</p> <div style="display: flex; align-items: center; justify-content: center;"> <p style="margin: 0;">INM: Task 1 and 2 Student Practice: All</p> </div> </div>			Time	I. Do Now	8 min	II. INM/Concept Development	35 min	III. Student Practice	15 min	IV. Student Debrief	5 min	V. Exit Ticket	7 min
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Important Vocabulary	Lesson Look Fors													
<ul style="list-style-type: none"> ▪ Event* ▪ Experiment ▪ Outcome ▪ Probability ▪ Sample Space ▪ Trial 	<p>Look for teachers to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Build students' understanding of probability through real-world situations. <input type="checkbox"/> Remind students of the definition of factors, multiples, and composite numbers <p>Look for students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> determine how likely an event is to happen using its probability expressed as a fraction, decimal or percent. 													
Student Know/Do Chart														
<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <p> Know</p> <p> Know</p> <p> Know</p> <p> Do</p> </div> <div style="width: 80%;"> <p>Probability is the measure of how likely something is to happen.</p> <p>The closer an event's probability is to 1 or 100%, the more likely it is to happen.</p> <p>Probability can be expressed as a fraction, decimal or percent</p> <p>Calculate the simple probability of an event as a fraction, decimal or percent when given the number of possible outcomes and the number of desired outcomes.</p> </div> </div>														

Lesson 2: Experimental Probability		Date: _____											
Standard(s)	Notes for Intellectual Preparation & Lesson Planning												
<p>◆ 7.6(C) make predictions and determine solutions using experimental data for simple and compound events</p> <p>◆ 7.6(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces</p>	<p>Necessary Materials and Pre-Lesson Prep</p> <ul style="list-style-type: none"> ▪ Unit 9 Student Workbook ▪ Document Camera ▪ Dice/Number Cube ▪ Coins ▪ Mystery Box 												
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Important Vocabulary	<p>Mathematical Goal of this Lesson</p> <p>The primary goal of this lesson is for students to calculate the experimental probability of an event and express it as a fraction, decimal or percent. They will build an understanding that experimental probability is found by actually performing an experiment and recording the results.</p> <p>Opportunities to CFU</p> <ul style="list-style-type: none"> ✓ INM: Task 1 d-e, Task 4 and 5 ✓ Student Practice: #1c, #2d 												
<ul style="list-style-type: none"> ▪ Experiment ▪ Outcome ▪ Probability ▪ Sample Space ▪ Trial 	<p>Other Notes to Inform Your Planning</p> <p>For Do Now: Consider replacing this Do Now with a review of simplifying fractions, if you believe students may need it.</p> <p>For INM: In Task 2, consider allowing students access to a calculator. This will allow you to focus on building students' ability to interpret graphs, set up probability fractions, and convert decimals to percentages, without the potential barrier of long division gaps. In Task 4 and Task 5, have students put away the calculator, these tasks focus on using number sense – scaling factors. This is the type of number reasoning that will be most beneficial on STAAR, as the majority of their questions utilize scaling factors. This lesson makes use of frequency tables and bar graphs to determine probability. Consider reviewing students on the characteristics of each graph.</p>												
	<div style="border: 1px solid black; padding: 5px; background-color: #fff9c4;"> <p>Focus on Disciplinary Literacy</p>  <p>INM: Task 1-4 Student Practice: #2</p> </div>												
		Lesson Look Fors											
		<p>Look for teachers to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Allow students to build their own understanding of experimental probability by experimenting <p>Look for students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> An understanding of experimental probability by actually performing an experiment. Ask: "What does experimental probability measure?" 											
		Student Know/Do Chart											
		<p> Experimental probability is found by actually doing an experiment of simulation and recording the results.</p> <p> Proportional reasoning is used to make predictions about a bigger population using the results. Calculate Experimental Probability</p> <p> Use proportional reasoning to make predictions about a bigger population using experimental data</p> <p> Express experimental probability as a fraction, decimal and percent in simplest form.</p> <p> Simplify ratios/fractions that represent experimental probability</p>											

Lesson 3: Theoretically Probability		Date: _____												
Standard(s)	Notes for Intellectual Preparation & Lesson Planning	Lesson Look Fors												
<p>◆ 7.6(D) Make predictions and determine solutions using theoretical probability for simple and compound events</p> <p>◆ 7.6(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces</p>	<p>Necessary Materials and Pre-Lesson Prep</p> <ul style="list-style-type: none"> ▪ Unit 9 Student Workbook ▪ Document Camera ▪ Dice/Number Cube ▪ Coins ▪ Mystery Box <p>Lesson Agenda</p> <table border="1"> <thead> <tr> <th></th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>I. Do Now</td> <td>8 min</td> </tr> <tr> <td>II. INM/Concept Development</td> <td>30 min</td> </tr> <tr> <td>III. Student Practice</td> <td>20 min</td> </tr> <tr> <td>IV. Student Debrief</td> <td>5 min</td> </tr> <tr> <td>V. Exit Ticket</td> <td>7 min</td> </tr> </tbody> </table> <p>Mathematical Goal of this Lesson The primary goal of this lesson is for students to calculate the theoretical probability of an event as a fraction, decimal and percent. They will also use theoretical probability to make predictions about a bigger population. This lesson will build on what students learned yesterday about experimental probability.</p> <p>Opportunities to CFU</p> <ul style="list-style-type: none"> ✓ INM: Task 1b, c, d, e, Task 2b, c, d, e ✓ Student Practice: #1e-f, #6b <p>Other Notes to Inform Your Planning For Do Now: Question 1 requires some application. Be sure that students take into account that each guest will order 2 drinks. For INM: For <i>Task 1</i>, introduce students to probability notation (i.e., P(red) means probability of red). In <i>Task 2</i>, have students with a partner for 6 minutes. Use academic monitoring to decide 1-2 questions to debrief whole class. For Student Practice: The focus should be on students being able to identify scaling factors to solve, do not allow calculator use. If you believe a long division gap will decrease the effectiveness of this practice time, encourage students to skip question 3 and return to it once they have completed the other problems. Consider allowing students who struggle with long division to use graph paper to help with organizing numbers.</p>		Time	I. Do Now	8 min	II. INM/Concept Development	30 min	III. Student Practice	20 min	IV. Student Debrief	5 min	V. Exit Ticket	7 min	<p>Look for teachers to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Use students' prior knowledge of equivalent fractions, decimals and percents to connect what they are learning today about expressing probability. <input type="checkbox"/> Provide students who struggle with long division graph paper to help with organizing numbers <p>Look for students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Fluently convert between fractions, decimals and percents when expressing the probability of an event.
		Time												
I. Do Now	8 min													
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III. Student Practice	20 min													
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<p>Important Vocabulary</p> <ul style="list-style-type: none"> ▪ Experiment ▪ Experimental Probability ▪ Outcome ▪ Probability ▪ Sample Space ▪ Theoretical Probability ▪ Trial 	<p>Focus on Disciplinary Literacy</p>  <p>INM: Task 1-2 Student Practice: #6</p>	<p>Student Know/Do Chart</p> <p> Theoretical probability is the ratio of favorable outcomes to possible outcomes and can be expressed as fractions, decimals or percents</p> <p> Proportional reasoning is used to make predictions about how many times an event would occur using theoretical probability as the initial ratio.</p> <p> Express the theoretical probability using the ratio of favorable outcomes to possible outcomes</p> <p> Express probability as a fraction, decimal and percent</p> <p> Use/read probability notation P(event)</p> <p> Use theoretical probability to make a prediction about the number of favorable events that would occur given a number of possible outcomes.</p>												

Lesson 4: Experimental Vs. Theoretical		Date: _____												
Standard(s)	Notes for Intellectual Preparation & Lesson Planning													
<p>◆ 7.6(C) make predictions and determine solutions using experimental data for simple and compound events</p> <p>◆ 7.6(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces</p>	<p>Necessary Materials and Pre-Lesson Prep</p> <ul style="list-style-type: none"> ▪ Unit 9 Student Workbook ▪ Document Camera ▪ Dice/Number Cube ▪ Coins ▪ Mystery Box <p>Lesson Agenda</p> <table border="1" style="width: 100%;"> <thead> <tr> <th></th> <th style="text-align: center;">Time</th> </tr> </thead> <tbody> <tr> <td>I. Do Now</td> <td style="text-align: center;">8 min</td> </tr> <tr> <td>II. INM/Concept Development</td> <td style="text-align: center;">35 min</td> </tr> <tr> <td>III. Student Practice</td> <td style="text-align: center;">15 min</td> </tr> <tr> <td>IV. Student Debrief</td> <td style="text-align: center;">5 min</td> </tr> <tr> <td>V. Exit Ticket</td> <td style="text-align: center;">7 min</td> </tr> </tbody> </table> <p>Mathematical Goal of this Lesson The primary goal of this lesson is for students to compare experimental and theoretical probabilities. This lesson ties together the previous two lessons on experiment and theoretical probability. Students will be given situations where an experiment is performed, and they know the theoretical probability of an event then asked to compare what actually happened to what was supposed to happen</p>			Time	I. Do Now	8 min	II. INM/Concept Development	35 min	III. Student Practice	15 min	IV. Student Debrief	5 min	V. Exit Ticket	7 min
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Important Vocabulary	Lesson Look Fors													
<ul style="list-style-type: none"> ▪ Experiment ▪ Experimental Probability ▪ Outcome ▪ Probability ▪ Sample Space ▪ Theoretical Probability ▪ Trial 	<p>Look for teachers to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Build understanding of the difference between experimental and theoretical probability using real world situations <p>Look for students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Use their real-world results of an experiment to compare the experimental and theoretical probabilities of an event. <i>Ask: "What is the difference between experimental</i> 													
	Opportunities to CFU	Student Know/Do Chart												
	<p>✓ INM: Task D, Task F, Task G</p> <p>✓ Student Practice: #1, 3</p> <p>Other Notes to Inform Your Planning For INM: This lesson makes use of frequency tables and bar graphs to determine probability. Consider reviewing students on the characteristics of each graph. You may also decide to provide an anchor chart for students to reference during the INM/Student Practice.</p>													
	<p>Focus on Disciplinary Literacy</p> <div style="display: flex; align-items: center; justify-content: center;">  <p>INM: Task A-G Student Practice: #1, 3</p> </div>													
	<p> While theoretical probability is what is supposed to happen given the ratio of favorable to possible outcomes; experimental probability is what actually does happen when you do an experiment and record the results.</p> <p> Compare the theoretical and experimental probability of an event happening</p> <p> Express experimental and theoretical probability as a fraction, decimal and percent in simplest form.</p>													

Lesson 5: Introduction to Compound Probability		Date: _____												
Standard(s)	Notes for Intellectual Preparation & Lesson Planning	Lesson Look Fors												
<p>◆ 7.6(A) represent sample spaces for simple and compound events using lists and tree diagrams</p> <p>◆ 7.6(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces</p>	<p>Necessary Materials and Pre-Lesson Prep</p> <ul style="list-style-type: none"> ▪ Unit 9 Student Workbook ▪ Document Camera ▪ Dice/Number Cube ▪ Coins <p>Lesson Agenda</p> <table border="1"> <thead> <tr> <th></th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>I. Do Now</td> <td>6 min</td> </tr> <tr> <td>II. INM/Concept Development</td> <td>45 min</td> </tr> <tr> <td>III. Student Practice</td> <td>8 min</td> </tr> <tr> <td>IV. Student Debrief</td> <td>4 min</td> </tr> <tr> <td>V. Exit Ticket</td> <td>7 min</td> </tr> </tbody> </table> <p>Mathematical Goal of this Lesson</p> <p>The primary goal of this lesson is for students to calculate compound probability using models and the algorithm. Students will discover the procedure for finding the probability of compound events using models such as probability tables and tree diagrams.</p> <p>Opportunities to CFU</p> <ul style="list-style-type: none"> ✓ INM: Task 1, Task 4, The last 2 rows in the table ✓ Student Practice: #2, #3 <p>Other Notes to Inform Your Planning</p> <p>For Do Now: The Do Now is intended to be brief. The recommendation is that students receive no more than 3 minutes of independent work time. The debrief should be brief as well. The duration of this portion of the lesson should be no longer than 6 minutes.</p> <p>For INM: Ensure that your diagrams are neat and organized. It is easy to get confused if the diagrams are hard to read. When modeling, self identity and have students identify where the possible outcomes are placed and how they are organized within a given representation. For example, in the table, the first row and first column indicate the sample space for their respective event.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Focus on Disciplinary Literacy</p>  <p>INM: Task 1-4 Student Practice: #1-3</p> </div>		Time	I. Do Now	6 min	II. INM/Concept Development	45 min	III. Student Practice	8 min	IV. Student Debrief	4 min	V. Exit Ticket	7 min	<p>Look for teachers to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Allow students do the heavy lifting when discovering the process for calculating the total number of possible outcomes and the algorithm for finding compound probability using diagrams and models. <p>Look for students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Look for students to discover the procedure for finding the probability of compound events using models such as probability tables and tree diagrams. <i>Ask</i>: “When you have two events, how do you calculate the total number of possible outcomes?”
	Time													
I. Do Now	6 min													
II. INM/Concept Development	45 min													
III. Student Practice	8 min													
IV. Student Debrief	4 min													
V. Exit Ticket	7 min													
Important Vocabulary		Student Know/Do Chart												
<ul style="list-style-type: none"> ▪ Combinations ▪ Compound Probability ▪ Experiment ▪ Experimental Probability ▪ Outcome ▪ Probability ▪ Sample Space ▪ Trial 		<p> Compound probability is the probability of two or more events occurring. It can be calculated using a probability table, a tree diagram or by multiplying the probability of each simple event together.</p> <p> Calculate the probability of compound events using models and the algorithm</p> <p> Write the probability of compound events as a fraction, decimal and percent</p>												

Lesson 6: Independent Vs. Dependent Events		Date: _____												
Standard(s)	Notes for Intellectual Preparation & Lesson Planning	Lesson Look Fors												
<p>◆ 7.6(A) represent sample spaces for simple and compound events using lists and tree diagrams</p> <p>◆ 7.6(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces</p>	<p>Necessary Materials and Pre-Lesson Prep</p> <ul style="list-style-type: none"> ▪ Unit 9 Student Workbook ▪ Document Camera ▪ Dice/Number Cube ▪ Coins <p>Lesson Agenda</p> <table border="1"> <thead> <tr> <th></th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>I. Do Now</td> <td>8 min</td> </tr> <tr> <td>II. INM/Concept Development</td> <td>40 min</td> </tr> <tr> <td>III. Student Practice</td> <td>10 min</td> </tr> <tr> <td>IV. Student Debrief</td> <td>5 min</td> </tr> <tr> <td>V. Exit Ticket</td> <td>7 min</td> </tr> </tbody> </table> <p>Mathematical Goal of this Lesson</p> <p>The primary goal of this lesson is for students to differentiate independent and dependent events in probability and calculate compound probability involving independent events as well as dependent events. They will discover the difference between independent and dependent events.</p> <p>Opportunities to CFU</p> <ul style="list-style-type: none"> ✓ INM: Reflect and Debrief #1-4; Task 5 ✓ Student Practice: #1, 2, 4, 5 <p>Other Notes to Inform Your Planning</p> <p>For INM: During the INM for Task 4 and 5 stamp for students that when finding compound probability of dependent events, multiplication is necessary NOT addition. Students often make the mistake of adding instead of multiplying when calculating. It would be a good practice to have students label each event in the INM/Student Practice as “Independent or Dependent; multiply or x”.</p> <p>Student Practice: Plan for misconceptions around problems 1, 2, 4, 5; students will often become confused finding compound probability of dependent events where the total for the second event becomes smaller because an item was removed in the first event (i.e., #4: “What is the probability that the first student chosen is a Senior, and the second student chose is a Junior?”). The first even directly impacted the second event because it isn’t possible to include the student that was already <i>chosen</i> in the total for the second event.</p>		Time	I. Do Now	8 min	II. INM/Concept Development	40 min	III. Student Practice	10 min	IV. Student Debrief	5 min	V. Exit Ticket	7 min	<p>Look for teachers to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Expose students to similar situations, one of which involves the two events being independent of each other and one of which involves the two events being dependent. <input type="checkbox"/> STAMP for students that when finding compound probability of dependent events, it is necessary to multiply NOT add. <p>Look for students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Discover the difference between independent and dependent events. <i>Ask:</i> “What is the difference between independent and dependent events?” <input type="checkbox"/> Multiply when finding the compound probability of dependent events rather than adding.
		Time												
I. Do Now	8 min													
II. INM/Concept Development	40 min													
III. Student Practice	10 min													
IV. Student Debrief	5 min													
V. Exit Ticket	7 min													
<p>Important Vocabulary</p> <ul style="list-style-type: none"> ▪ Combinations ▪ Compound Probability ▪ Dependent Events ▪ Experiment ▪ Experimental Probability ▪ Independent Events ▪ Outcome ▪ Sample Space ▪ Trial 	<p style="text-align: center;">Focus on Disciplinary Literacy</p> <div style="text-align: center;">  <p>INM: ‘Let’s reflect and debrief Student Practice: #1-3</p> </div>	<p>Student Know/Do Chart</p> <ul style="list-style-type: none">  When calculating the compound of two independent events, the first event will not impact the second event  When calculating the compound of two dependent events happening, the first event will impact the second event  Calculate the compound probability of two independent events.  Calculate the compound probability of two dependent events. 												

Lesson 7: Compound Probability		Date: _____												
Standard(s)	Notes for Intellectual Preparation & Lesson Planning													
<p>◆ 7.6(A) represent sample spaces for simple and compound events using lists and tree diagrams</p> <p>◆ 7.6(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces</p>	<p>Necessary Materials and Pre-Lesson Prep</p> <ul style="list-style-type: none"> ▪ Unit 9 Student Workbook ▪ Document Camera ▪ Dice/Number Cube ▪ Coins <p>Lesson Agenda</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 20%; text-align: center;">Time</th> </tr> </thead> <tbody> <tr> <td>I. Do Now</td> <td style="text-align: center;">8 min</td> </tr> <tr> <td>II. INM/Concept Development</td> <td style="text-align: center;">25 min</td> </tr> <tr> <td>III. Student Practice</td> <td style="text-align: center;">20 min</td> </tr> <tr> <td>IV. Student Debrief</td> <td style="text-align: center;">10 min</td> </tr> <tr> <td>V. Exit Ticket</td> <td style="text-align: center;">7 min</td> </tr> </tbody> </table> <p>Mathematical Goal of this Lesson The primary goal of this lesson is for students to calculate the probability of compound events requiring a model. This lesson is similar to the last lesson and can be considered an extension and review.</p> <p>Opportunities to CFU</p> <ul style="list-style-type: none"> ✓ INM: Task 2 a-b, Task 3 ✓ Student Practice: #2 			Time	I. Do Now	8 min	II. INM/Concept Development	25 min	III. Student Practice	20 min	IV. Student Debrief	10 min	V. Exit Ticket	7 min
		Time												
I. Do Now	8 min													
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Important Vocabulary	Lesson Look Fors													
<ul style="list-style-type: none"> ▪ Combinations ▪ Compound Probability ▪ Dependent Events ▪ Experiment ▪ Experimental Probability ▪ Independent Events ▪ Outcome ▪ Sample Space ▪ Trial 	<p>Look for teachers to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Model calculating compound probability using a variety of different types of models. <p>Look for students to...</p> <ul style="list-style-type: none"> <input type="checkbox"/> Use probability simulations to calculate the probability of compound events that can't be solved using 													
	Other Notes to Inform Your Planning		Student Know/Do Chart											
<p>For Do Now: In the Do Now debrief, simply provide the answer and rationale to question 1. However, it would be extremely beneficial for students to see that question 2 can be solved using fractions OR decimals, as it will strengthen their understanding of equivalency.</p> <p>For INM/Student Practice: Use guided questioning to prompt students to answer Tasks 2 and 3 (i.e., Does this situation involve a simple event or compound events? How do you know? Does one event depend on the other or are the events independent? If compound events: What is the probability of the 1st event? What is the probability of the 2nd event? How do you know? What should I do next?). Provide students who struggle with a 12x12 Multiplication Chart.</p>		<p> When calculating the compound of two independent events, the first event will not impact the second event</p> <p> When calculating the compound of two dependent events happening, the first event will impact the second event</p> <p> Calculate the compound probability of events using models and simulations</p>												
<p>Focus on Disciplinary Literacy</p> <div style="display: flex; align-items: center; justify-content: center;">  <p>INM: Task 1-3 Student Practice: #3</p> </div>														

Recommended Success Day Materials and Resources

Probability 7.6C and 7.6I

Virtual Nerd Video on Probability

7.6I Practice

Video on Predictions

7.6C Practice

Tech-Enhanced Practice

Notes to Inform Your Planning

These resources can be used for either small-group or whole-group reteach.

If student data indicates a pause point is not necessary, you can opt to move forward and reserve a Success Day to use at a later date.

Using exit ticket data can help you prioritize what to review. For example, if you remember that students did poorly on Lesson 5, pull problems from lesson 6, especially if they are problems students did not do before (for example, SP or INM problems you skipped during class). You can also take questions from the resources linked above.

All unit exams should be given online to prepare students for STAAR online.

UNPACKED STANDARDS

Focus standards for this unit.

Standard Breakdown

Standard	Specificity	STAAR Alignment																				
<p>7.6(H) solve problems using qualitative and quantitative predictions and comparisons from simple experiments</p>	<p>Concepts: Qualitative Quantitative Simple Experiments</p> <p>Skills: Solve Predict Compare</p> <p>Limitations:</p> <p>Clarifications:</p> <ul style="list-style-type: none"> • Predictions are made using proportional reasoning where the experimental or theoretical probability represents the first ratio • Proportions should be solved by finding the scale factor rather than using cross-multiplication 	<p>2025 Q1</p> <p>2025 – Q1</p> <p>The manager of an ice-cream shop randomly surveyed 70 children to find out their favorite flavor of ice cream. The results of the survey are shown in the table.</p> <table border="1" data-bbox="1236 492 1488 643"> <caption>Favorite Ice-Cream Flavor</caption> <thead> <tr> <th>Flavor</th> <th>Number of Children</th> </tr> </thead> <tbody> <tr> <td>Vanilla</td> <td>16</td> </tr> <tr> <td>Chocolate</td> <td>28</td> </tr> <tr> <td>Strawberry</td> <td>12</td> </tr> <tr> <td>Orange sherbet</td> <td>14</td> </tr> </tbody> </table> <p>Based on the results in the table, which statement is true about the next 350 children surveyed about their favorite ice-cream flavor?</p> <p><input type="radio"/> Ⓐ The number of children who select vanilla will be twice the number of children who select strawberry.</p> <p><input type="radio"/> Ⓑ The number of children who select vanilla will be twice the number of children who select orange sherbet.</p> <p><input type="radio"/> Ⓒ The number of children who select chocolate will be twice the number of children who select orange sherbet.</p> <p><input type="radio"/> Ⓓ The number of children who select orange sherbet will be twice the number of children who select strawberry.</p> <p>! 2025 – Q19</p> <p>A grocery store manager randomly surveyed 100 customers about their favorite vegetable. The results are displayed in the table.</p> <table border="1" data-bbox="1291 1068 1472 1206"> <caption>Favorite Vegetable</caption> <thead> <tr> <th>Vegetable</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>Potatoes</td> <td>24</td> </tr> <tr> <td>Broccoli</td> <td>16</td> </tr> <tr> <td>Corn</td> <td>36</td> </tr> <tr> <td>Green beans</td> <td>24</td> </tr> </tbody> </table> <p>If the manager surveys another 50 customers, which prediction is supported by the information in the table?</p> <p><input type="radio"/> Ⓐ Customers will choose broccoli $\frac{1}{4}$ of the time.</p> <p><input type="radio"/> Ⓑ Customers will choose corn $1\frac{1}{2}$ times as often as green beans.</p> <p><input type="radio"/> Ⓒ The number of customers who choose potatoes will be 8 times the number who choose broccoli.</p> <p><input type="radio"/> Ⓓ The number of customers who choose corn will be 6 less than the number who choose potatoes.</p>	Flavor	Number of Children	Vanilla	16	Chocolate	28	Strawberry	12	Orange sherbet	14	Vegetable	Frequency	Potatoes	24	Broccoli	16	Corn	36	Green beans	24
Flavor	Number of Children																					
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2024 Q6:

2024 – Q6

A school librarian surveyed 80 randomly selected students about their favorite type of book. The results are shown in the table.

Favorite Type of Book

Type of Book	Number of Students
Action	24
Mystery	14
Fantasy	15
Nonfiction	9
Biography	18

Based on the results in the table, which types of books make the statements about a randomly selected student true?

Move the correct answer to each box. Not all answers will be used.

Action Mystery Fantasy Nonfiction Biography

The student is more than twice as likely to prefer as to prefer .

The student is equally likely to prefer Action as to prefer Nonfiction or .

2024 – Q29

A survey was given to 200 students about their favorite type of pet. The survey results are shown in the table.

Favorite Type of Pet

Pet	Number of Students
Dog	110
Rabbit	10
Cat	65
Fish	15

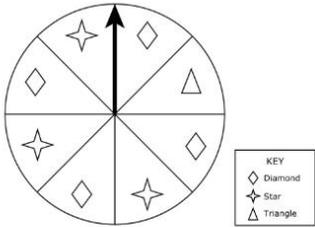
Based on the results in the table, which statement about a randomly selected student is true?

- Ⓐ The student is equally likely to prefer any of the types of pet.
- Ⓑ The student is 5 times as likely to prefer a fish as to prefer a rabbit.
- Ⓒ The student is less likely to prefer fish than to prefer any other type of pet.
- Ⓓ The student is more likely to prefer a dog than to prefer any other type of pet.

2023 Q15:

2023 – Q15

A fair spinner is divided into sections of equal size. Each section contains the picture of a diamond, a star, or a triangle.



KEY
 ◊ Diamond
 ☆ Star
 ▲ Triangle

Which statement about the result of spinning the arrow is true?

A It is more likely to land on a diamond than on a star.

B It is equally likely to land on a triangle, a star, or a diamond.

C It is 4 times as likely to land on a diamond as it is to land on a star.

D It is less likely to land on a diamond than on a star.

2023 – Q35

The table shows the number of games in which a basketball team's total score was within each of five ranges of points.

Basketball Team Scores	
Total Score	Number of Games
96–105	19
106–115	21
116–125	17
126–135	10
136–145	3

Using the data in the table, complete the predictions about the number of points the team will score in its next game.

Move the correct answer to each box. Each answer may be used more than once. Not all answers will be used.

more likely than less likely than equally likely as

Scoring 96–105 points in the next game is scoring 136–145 points in the next game.

Scoring 116–125 points in the next game is scoring 106–115 points in the next game.

7.6(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces

Concepts:

- Experimental Probability
- Theoretical Probability
- Simple Events
- Compound Events
- Data
- Sample Spaces

Skills:

- Determine

Limitations:

- Compound probability problems are limited to situations in which the order of the events does not matter.

2025 Q13

2025 – Q13

A box contains 5 colors of key chains. Kayden randomly selects a key chain from the box, records its color, and then returns the key chain to the box. He does this 40 times. The results are shown in the table.

Key Chains	
Color	Frequency
Red	7
Orange	9
Yellow	5
Green	8
Blue	11

Based on Kayden's results, what is the experimental probability that the next key chain he selects will be yellow or green?

(A) $\frac{1}{5}$

(B) $\frac{13}{40}$

(C) $\frac{2}{5}$

(D) $\frac{3}{40}$

2025 – Q24

A deck of cards contains red, orange, yellow, and green cards. For each color, there are 10 cards labeled 0 through 9.

What is the probability of randomly selecting a red card, replacing the card, and then randomly selecting a card labeled 0?

(A) $\frac{1}{40}$

(B) $\frac{1}{20}$

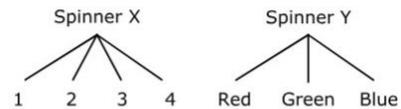
(C) $\frac{13}{40}$

(D) $\frac{7}{20}$

2024 Q13

2024 – Q13

Spinner X is divided into 4 equal sections, and Spinner Y is divided into 3 equal sections. The possible outcomes for each spinner are shown in the tree diagrams.



Both spinners are spun at the same time. What is the probability that Spinner X will land on 2 and Spinner Y will land on blue?

(A) $\frac{7}{12}$

(B) $\frac{1}{12}$

(C) $\frac{2}{7}$

(D) $\frac{1}{2}$

2024 – Q31

A deck of cards contains red, blue, orange, and yellow cards. A card is drawn and then replaced. This process is carried out 40 times. The results are shown in the table.

Results	
Color	Frequency
Red	9
Blue	8
Orange	13
Yellow	10

Based on these results, what is the experimental probability that the next card drawn is red or orange?

(A) $\frac{13}{40}$

(B) $\frac{1}{2}$

(C) $\frac{11}{20}$

(D) $\frac{9}{40}$

2023 Q16

2023 – Q16

A geometric solid with 8 faces is used in a game. Each face of the solid is labeled with a different number from 1 to 8. Amelia rolled the solid 30 times and recorded the number showing on the top face. The results are shown in the table.

8	8	2	5	4	6	1	3	8	2
7	8	2	3	1	8	1	1	5	7
8	3	3	1	1	6	1	4	3	8

Based on these results, what is the experimental probability that the next time the solid is rolled it will land with a 7 showing on the top face?

Ⓐ $\frac{4}{15}$

Ⓑ $\frac{1}{8}$

Ⓒ $\frac{1}{4}$

Ⓓ $\frac{1}{15}$

 2023 – Q30

A deli makes sandwiches using 1 type of bread, 1 type of meat, and 1 type of cheese for each sandwich. The sandwich options are shown in the table.

Deli Sandwich

Bread	Meat	Cheese
White	Ham	American
Wheat	Turkey	Cheddar
	Salami	

What is the probability that a customer will randomly choose a sandwich that is made using white bread, ham, and cheddar cheese?

Ⓐ $\frac{1}{2}$

Ⓑ $\frac{1}{3}$

Ⓒ $\frac{1}{6}$

Ⓓ $\frac{1}{12}$

VERTICAL STANDARDS

This section details the **progression** of key student expectations/standards** in the courses **before** and **after** this course. This will help you understand what **prior knowledge skills to build upon** and guide you in knowing what **skills you are preparing your students** for in the subsequent course.

6 th Grade	7 th Grade (previous units)	Geometry
<p>6.4(B) apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates</p> <p>6.4(G) generate equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money</p> <p>6.5(B) solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models</p> <p>6.4(E) represent ratios and percents with concrete models, fractions, and decimals</p>	<p>7.4(A) represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$</p> <p>7.4(D) solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems</p>	<p>G.13(C) identify whether two events are independent and compute the probability of the two events occurring together with or without replacement</p> <p>G.13(A) develop strategies to use permutations and combinations to solve contextual problems</p> <p>G.13(B) determine probabilities based on area to solve contextual problems</p> <p>G.13(D) apply conditional probability in contextual problems</p> <p>G.13(E) apply independence in contextual problems</p>