Orange Public Schools

Office of Curriculum & Instruction

2019-2020 Mathematics Curriculum Guide

7th Grade Mathematics (Accelerated)

Illustrative Mathematics - Unit 11: Probability & Sampling

May 19, 2020 – June 11, 2020

Board Approved: 1.14.2020

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From the New Jersey State Learning Standards:

Traditional Pathway Accelerated 7th Grade

In **Accelerated 7th Grade,** instructional time should focus on four critical areas: (1) Rational Numbers and Exponents; (2) Proportionality and Linear Relationships; (3) Introduction to Sampling Inference; (4) Creating, Comparing, and Analyzing Geometric Figures

1. Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems. They extend their mastery of the properties of operations to develop an understanding of integer exponents, and to work with numbers written in scientific notation.

2. Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y= mx + b$), understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x-coordinate changes by an amount A, the output or y-coordinate changes by the amount $m \times A$. Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation.

3. Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences

4. Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity, they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross sections. They solve real- world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.

Yearlong Pacing Guide
Accelerated 7

Grade	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
6	Unit 1 6.G		Unit 2 6.RP	Unit 3 6.RP	Unit 4 6.NS		Unit 5 6.NS	Unit 6 6.EE	Unit 7 6.NS	Unit 8 6.SP
Acc 7	Unit 1 7.RP	Unit 2 7.G	Unit 3 7.RP	Unit 4 7.NS	Unit 5 7.EE	Unit 6 7.G	Unit 7 8.G	Unit 8 8.G	Unit 9 8.EE	Unit 10 8.EE	Unit 11 7.SP

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
7.RP: Scale Drawings & Proportional Relationships	**7.G:** Measuring Circles	**7.RP:** Proportional Relationships & Percentages	**7.NS:** Rational Number Arithmetic	**7.EE:** Expressions, Equations, & Inequalities

Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11
7.G: Angles, Triangles and Prisms	**8.G:** Rigid Transformations & Congruence	**8.G.** Dilations, Similarity, and Introducing Slope	**8.EE:** Linear Relationships	**8.EE:** Exponents and Scientific Notation	**7.SP:** Probability & Sampling

2019-2020 Accelerated Grade 7 (iM)

Quarter 1			Quarter 2			Quarter 3			Quarter 4	
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11
iM 7.1 iM 7.2	iM 7.3	iM 7.4	iM 7.5	iM 7.6	iM 7.7	iM 8.1	iM 8.2	iM 8.3	iM 8.7	iM 7.8
7.G.1(A) 7.RP.2a(M) 7.RP.2b(M) 7.RP.2c(M) 7.RP.2d(M)	7.G.4(A)	7.RP.1(M) 7.RP.3(M)	7.NS.1(M) 7.NS.2(M) 7.NS.3(M)	7.EE.3(M) 7.EE.4(M) 7.EE.2(M) 7.EE.1(M)	7.G.5(A) 7.G.2(A) 7.G.3(A) 7.G.6(A)	8.G.1(M) 8.G.2(M) 8.G.5(M)	8.G.4(M) 8.G.3(M) 8.EE.6(M)	8.EE.5(M) 8.F.4(S) 8.EE.8(M)	8.EE.1(M) 8.EE.3(M) 8.EE.4(M)	7.SP.6(S) 7.SP.5(S) 7.SP.7(S) 7.SP.8(S) 7.SP.1(S) 7.SP.2(S) 7.SP.3(S) 7.SP.4(S)
20 Days	8 Days	11 Days	14 Days	18 Days	12 Days	13 Days	12 Days	12 Days	11 Days	15 Days
Oct. 9	Oct. 24	Nov. 15	Dec. 12	Jan. 22	Feb. 12	Mar. 11	Apr. 1	Apr. 29	May. 18	June 11

Major Work Supporting Content Additional Content

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References

"Illustrative Mathematics" *Open Up Resources.* 2018 <https://auth.openupresources.org/register/complete>

I. Unit Overview

In this unit, students understand and use the terms “event,” “sample space,” “outcome,” “chance experiment,” “probability,” “simulation,” “random,” “sample,” “random sample,” “representative sample,” “overrepresented,” “underrepresented,” “population,” and “proportion.” They design and use simulations to estimate probabilities of outcomes of chance experiments and understand the probability of an outcome as its long-run relative frequency. They represent sample spaces (that is, all possible outcomes of a chance experiment) in tables and tree diagrams and as lists. They calculate the number of outcomes in a given sample space to find the probability of a given event. They consider the strengths and weaknesses of different methods for obtaining a representative sample from a given population. They generate samples from a given population, e.g., by drawing numbered papers from a bag and recording the numbers, and examine the distributions of the samples, comparing these to the distribution of the population. They compare two populations by comparing samples from each population.

Essential Questions

- How can we make generalizations from a sample to a population?
- How can random sampling be used to draw inferences about a population?
- How can we analyze data/graphs and describe patterns?
- What influences the probability that a given event will occur?
- What is the difference between experimental and theoretical probability?
- What determines whether an event is dependent or independent?
- How can we use modeling to form a prediction?
- Can we construct more than one kind of graph from the same set of data?

Enduring Understanding

- Reading, understanding, interpreting, and communicating data are critical in modeling a variety of real-world situations, drawing appropriate inferences, making informed decisions, and justifying those decisions.
- Probability quantifies the likelihood that something will happen and enables us to make predictions and informed decisions.
- The chance of an event happens may be represented by use of decimals, fractions, and or percentages.

II. Pacing Guide

Activity	New Jersey State Learning Standards (NJSLS)	Estimated Time (Blocks)
Unit 11 Pre-Unit Assessment (IM) *Optional*	6.NS.C.6, 7.RP.A.3, 6.RP.A.3.c, 6.RP.A.3, 7.NS.A.1, 7.NS.A.2, 6.SP.B.5.c , 6.SP.A.3, 6.SP.B.4, 6.SP.B.5	½
Lesson 1: Chance Experiments	7.SP.C.5	1
Lesson 2: Estimating Probabilities	7.RP.A, 7.SP.C.5, 7.SP.C.6, 7.SP.C.7, 7.SP.C.7.b	1
Lesson 3: Estimating Probabilities Using Simulation	7.SP.C, 7.SP.C.5, 7.SP.C.6, 7.SP.C.7.B, 7.SP.C.8.C	1
Lesson 4: Simulating Multi-Step Experiments and Keeping Track of All Possible Outcomes	7.RP.A, 7.SP.C.8.b, 7.SP.C.8.c	1
Lesson 5: Multi-Step Experiments	7.SP.C.8.a, 7.SP.C.8.b	1
Lesson 6: Design Simulations	7.SP.C.8.c	1
Lesson 7: Comparing Groups	7.SP.B, 7.SP.B.3	1
Lesson 8: Larger Populations & What Makes A Good Sample?	7.SP.A.1, 7.SP.A.7, 7.SP.A.2	1
Lesson 9: Sampling In a Fair Way	7.SP.A.1, 7.SP.A.2, 7.SP.C.7	1
Lesson 10: Estimating Population Measures of Center	7.SP.A.1, 7.SP.A.2, 7.SP.C.4	1
Lesson 11: Estimating Population Proportions	7.NS.A.2.d, 7.RP.A, 7.SP.A, 7.SP.A.2, 7.SP.B.4	1
Lesson 12: Comparing Populations Using Samples	7.SP.B.3, 7.SP.B.4	1
Lesson 13: Comparing Populations and Working with Measures of Center and Variability	7.SP.B.4	1
Unit 11 Performance Task *(Project Based Learning)*		½
Unit 11 End of Unit Assessment (IM) *Optional*	7.SP.A.1, 7.SP.A.2, 7.SP.C.7, 7.SP.C.8.c, 7.SP.C.5, 7.SP.B.4, 7.SP.C.6, 7.SP.B.3	**1**
Accelerated Grade 7 Interim Assessment 4	7.NS.A.3, 7.EE.A.1, 7.EE.B.3, 7.EE.B.4	**1**
Total Time		**16 Blocks**

Major Work Supporting Content Additional Content

III. Scope & Sequence

Accelerated Unit Lesson	Accelerated Lesson Name	Original Unit Lesson	Activity Name
11.1	Chance Experiments and Probability	7.8.2	Which is More Likely?
		7.8.2	How Likely Is It?
		7.8.2	Card Sort: Likelihood
		7.8.3	Which Game Would You Choose?
		7.8.3	What's possible?
11.2	Estimating Probabilities	7.8.4	In the Long Run
		7.8.4	Due For a Win
		7.8.4	Fiction or Non-fiction?
		7.8.5	Making My Head Spin
11.3	Estimating Probabilities Using Simulation	7.8.5	How Much Green?
		7.8.6	Diego's Walk
		7.8.6	Designing Experiments
		7.8.5	The Probability of Spinning B
11.4	Simulating Multi-step Experiments and Keeping Track of Possible Outcomes	7.8.7	Alpine Zoom
		7.8.7	Simulation Nation
		7.8.8	How Many Different Meals?
		7.8.8	Lists, Tables, and Trees
11.5	Multi-step Experiments	7.8.8	How Many Sandwiches?
		7.8.9	Spinning a Color and a Number
		7.8.9	Cubes and Coins
11.6	Designing Simulations	7.8.9	Pick a Card
		7.8.10	Breeding Mice
		7.8.10	Designing Simulations
		7.8.10	The Best Power-Up
		7.8.9	Pick a Card
11.7	Comparing Groups	7.8.11	Notice and Wonder: Comparing Heights
		7.8.11	More Team Heights
		7.8.11	Track Length
		7.8.12	John Jacobjingleheimerschmidt
11.8	Larger Populations & What Makes A Good Sample?	7.8.12	Siblings and Pets
		7.8.12	Sampling the Population
		7.8.13	Selling Paintings
		7.8.13	Sampling the Fish Market
11.9	Sampling in A Fair Way	7.8.14	Comparing Methods for Selecting Samples
		7.8.14	That's the First Straw
		7.8.14	That's the Last Straw
		7.8.14	Sampling Spinach
11.10	Estimating Populations Measures of Center	7.8.15	Describing the Center
		7.8.15	Three Different TV Shows
		7.8.15	Who's Watching What?
		7.8.15	Movie Reviews
		7.8.15	More Accurate Estimate

11.11	Estimating Population Proportions	7.8.16	Getting to School
		7.8.16	Reaction Times
		7.8.16	A New Comic Book Hero
		7.8.16	More than 48 Grams
11.12	Comparing Populations Using Samples	7.7.15	The Science Fair
		7.7.15	A Wheelbarrow of Concrete
		7.7.16	Foam Play Structure
		7.7.16	Preparing for the Play
11.13	Comparing Populations and Working with Measures of Center and Variability	7.7.15	The Science Fair
		7.7.15	A Wheelbarrow of Concrete
		7.7.16	Foam Play Structure
		7.7.16	Preparing for the Play

IV. Pacing Calendar

Please complete the pacing calendar based on the suggested pacing (*see Pacing Guide on page 2)*.

MAY

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	**2**
3	**4**	**5**	**6**	**7**	**8**	**9**
10	**11**	**12**	**13**	**14**	**15**	**16**
17	**18**	**19**	**20**	**21**	**22**	**23**
24	**25**	**26**	**27**	**28**	**29**	**30**
31						

Please complete the pacing calendar based on the suggested pacing (*see Pacing Guide on page 2)*.

JUNE

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

V. NJSLA Assessment Evidence Statements

Type I Type II Type III

NJSLS	Evidence Statement	Clarification	Math Practices	Calculator ?
7.SP.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.		MP. 4	Yes
7.SP.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.		MP. 4	Yes
7.SP.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.	i) Tasks may use mean absolute deviation, range, or interquartile range as a measure of variability	MP. 4	Yes
7.SP.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh grade science book are generally longer than the words in a chapter of a fourth grade science book.		MP. 4	Yes

7.SP.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	i) Tasks may involve probabilities that are certain (1) or impossible (0).	MP. 4	Yes
7.SP.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.	i) Tasks require the student to make a prediction based on long-run relative frequency in data from a chance process.	MP. 4	Yes
7.SP.7a	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.	i) Simple events only	MP. 4	Yes
7.SP.7b	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?		MP. 4	Yes

7.SP.8a	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs		MP. 4 MP. 5	Yes
7.SP.8b	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space, which compose the event		MP. 4 MP. 5	Yes
7.SP.8c	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?		MP. 4 MP. 5	Yes
7.D.1	Solve multi-step contextual word problems with degree of difficulty appropriate to Grade 7, requiring application of knowledge and skills articulated in Type I, Sub-Claim A Evidence Statements.	i) Tasks may have scaffolding, if necessary, in order to yield a degree of difficulty appropriate to grade 7. ii) Tasks involving writing or solving an equation should not go beyond the equation types described in 7.EE.4a. (px +q = r and p(x + q) = r where p, q, and r are specific rational number	MP.1 MP.2 MP.4 MP.5 MP.7	Yes

VI. Differentiated Instruction

Supporting English Language Learners

The purpose of this document is to nudge the field forward by offering support to the next generation of mathematics learners and by challenging persistent assumptions about how to support and develop students' disciplinary language. The goal is to provide guidance to mathematics teachers for recognizing and supporting students' language development processes in the context of mathematical sense making. UL/SCALE provides a framework for organizing strategies and special considerations to support students in learning mathematics practices, content, and language. The framework is intended to help teachers address the specialized academic language demands in math when planning and delivering lessons, including the demands of reading, writing, speaking, listening, conversing, and representing in math (Aguirre & Bunch, 2012). Therefore, while the framework can and should be used to support all students learning mathematics, it is particularly well-suited to meet the needs of linguistically and culturally diverse students who are simultaneously learning mathematics while acquiring English.

For more information, click the link below:

Supporting ELL Learners

Supporting Students with Disabilities

The philosophical stance that guided the creation of these materials is the belief that with proper structures, accommodations, and supports, all children can learn mathematics. Lessons are designed to maximize access for all students and include additional suggested supports to meet the varying needs of individual students. While the suggested supports are designed for students with disabilities, they are also appropriate for many children who struggle to access rigorous, grade-level content. Teachers should use their professional judgment about which supports to use and when, based on their knowledge of the individual needs of students in their classroom.

For more information, click the link below:

Supporting Students with Disabilities

VII. Vocabulary

Chance Experiment:	A chance experiment is something you can do over and over again and you don't necessarily know what is going to happen each time. For example, tossing a coin is a chance experiment which could result in heads or tails.
Event:	An event is a set of possible outcomes of a chance experiment. It could be just a single outcome, like heads when you toss a coin, or it could be a set of outcomes. For example, when you perform the chance experiment of tossing a coin twice, then "at least one head" is an event that includes the outcomes heads-tails, tails-heads, and heads-heads.
Interquartile Range (IQR):	The interquartile range of a data set is a measure of spread of its distribution. It is the difference between the third quartile (Q3) and the first quartile (Q1).
Mean:	The mean, or average, of a data set is the value you get by adding up all of the values in the set and dividing by the number of values in the set.
Mean Absolute Deviation (MAD):	The mean absolute deviation measures the spread in a distribution. It is the mean of the distances of the data points from the mean of the distribution. (It is called mean absolute deviation because the distance of a data point from the mean is the absolute value of its deviation from the mean.)
Median:	The median of a data set is the middle value when the data values are listed in order. If the number of values is even, it is the mean of the two middle values.
Outcome:	An outcome of a chance experiment is one of the things that can happen when you do the experiment. For example, the possible outcomes of tossing a coin are heads and tails.
Probability:	The probability of an event is a number that measures how likely the event is to occur. It can be 0, 1, or any number in between. It is 0 if the event will never occur and 1 if the event always occurs. If an event occurs half the time in the long run than its probability is 0.5.

Population:	A population is a set of people or things that we want to study.
Proportion:	For a set of data, a proportion is a number from 0 to 1 that represents the fraction of the data that belongs to a given category.
Random:	If all the outcomes of a chance experiment are equally likely, then we say the outcomes are random, or that they happen at random.
Representative:	A sample that is representative of a population has a distribution that closely resembles the distribution of the population in shape, center, and spread.
Sample:	A sample is a subset of a population
Sample Space:	The sample space for a chance experiment is the list of all possible outcomes of the experiment. For example, the sample space for tossing a coin twice is heads-heads, heads-tails, tails-heads, and tails-tails.

VIII. Assessment Framework

Unit 11 Assessment Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Pre-Unit Diagnostic Assessment (Beginning of Unit – Optional) *Illustrative Mathematics*	6.NS.C.6, 7.RP.A.3, 6.RP.A.3.c, 6.RP.A.3, 7.NS.A.1, 7.NS.A.2, 6.SP.B.5.c , 6.SP.A.3, 6.SP.B.4, 6.SP.B.5	½ Block	Individual	Yes (No Weight)
End-of-Unit Assessment (End of Unit – Optional) *Illustrative Mathematics*	7.SP.A.1, 7.SP.A.2, 7.SP.C.7, 7.SP.C.8.c, 7.SP.C.5, 7.SP.B.4, 7.SP.C.6, 7.SP.B.3	1 Block	Individual	Yes
Grade 7 Interim Assessment 4 (Mid June) *iReady Standards Mastery*	7.NS.3, 7.EE.3, 7.EE.1, 7.EE.4	1 Block	Individual	Yes

Unit 11 Performance Assessment Framework				
Assessment	**NJSLS**	**Estimated Time**	**Format**	**Graded ?**
Unit 11 Performance Task 1 (Early June) *Heads or Tails*	7.SP.C.6	½ Block	Individual	Yes; Rubric
Unit 11 Performance Task Option 1 (Optional) *Tossing Cylinders*	7.SP.C.6	Teacher Discretion	Teacher Discretion	Yes, if administered
Extended Constructed Response (ECR)* (click here for access)	Dependent on unit of study & month of administration	Up to 30 minutes	Individual	Yes; Rubric

* Use the following links to access ECR protocol and district assessment scoring documents:

- *Assessment & Data in Mathematics Bulletin*
- *Extended Constructed Response Protocol*

Name _____ Block _____ Date _____

Heads or Tails (7.SP.C.6)

Each of the 20 students in Mr. Anderson's class flipped a coin ten times and recorded how many times it came out heads.

A. How many heads do you think you will see out of ten tosses?

B. Would it surprise you to see 4 heads out of ten tosses? Explain why or why not.

C. Here are the results for the twenty students in Mr. Anderson's class. Use this data to estimate the probability of observing 4, 5 or 6 heads in ten tosses of the coin. (It might help to organize the data in a table or in a dot plot first.)

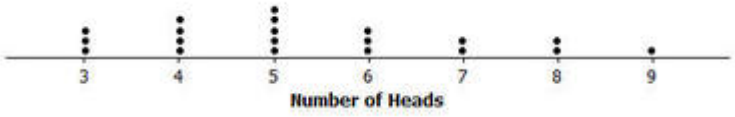
Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Number of Heads	3	5	4	6	4	8	5	4	9	5	3	4	7	5	8	6	3	6	5	7

Accelerated 7th Grade Heads or Tails Name: _____ Date: _____

NJSLS: 7.SP.C.6 Type: _____ Teacher: _____

Task Description	• Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams. • Clearly constructs and communicates a complete response by ➢ using a logical approach based on a conjecture and/or stated assumptions ➢ providing an efficient and logical progression of steps ➢ using grade-level vocabulary, symbols, and labels ➢ providing a justification of a conclusion with minor computational error ➢ evaluating, interpreting and critiquing the validity and efficiency of others' responses				
Command Level Description	***Level 5:*** ***Distinguished Command*** Perform the task items accurately or with minor computation errors.	***Level 4:*** ***Strong Command*** Perform the task items with some non-conceptual errors	***Level 3:*** ***Moderate Command*** Perform the task items with minor conceptual errors and some computation errors.	***Level 2:*** ***Partial Command*** Perform the task items with some errors on both math concept and computation.	***Level 1:*** ***No Command*** Perform the task items with serious errors on both math concept and computation..
Score range	*6 pts*	*5-4 pts*	*3 pts*	*2 pts*	*1-0 pts*
Task Score & PLD Assigned					

Accelerated 7th Grade Heads or Tails – Scoring Guide **NAME: _____**

#	Answer	Scoring
Part A	You will see approximately 5 heads out of 10 tosses	2 points: for responding with "approximately" or "around" or "about". -or- 1 point for indicating 5 heads but not acknowledging that it is an approximation. **2 TOTAL POINTS**
Part B	It would not be surprising to see only 4 heads in ten tosses. Although this outcome might occur less often than getting 5 heads.	1 point for indicating that seeing 4 heads out of 10 tosses is not surprising. -and- 1 point for accurately explaining there will be variability in the outcomes when a coin is tossed ten times, and that you don't always get 5 heads. **2 TOTAL POINTS**
Part C	Because 12 of the observed outcomes were 4, 5 or 6, the estimated probability is 12/20 = 0.60. A dot pot of the data is shown below: 	1 point for identifying the correct answer. -and- 1 point for using a dot plot, tree diagram, list or table to justify their answer. **2 TOTAL POINTS**

Name _____ Block _____ Date _____

Tossing Cylinders (7.SP.C.6)

Think about a cylindrical (or cylinder-like) object, such as a bottle lid or a roll of tape. Some possible objects are shown in the picture below. Suppose you were to toss one of these objects into the air and observe its landing position once it reaches the floor.

A. For your object, what are the possible outcomes of this experiment?

B. Make a guess – what are the probabilities of each of the possible outcomes?

C. Toss the object into the air and record the outcome. Repeat this process 25 to 30 times.

D. Determine the experimental probability of each outcome. How does this experimental probability compare to your guess from part b? Based on this information, would you like to change your guess?

E. Repeat this activity with a different cylindrical (or cylinder-like) object that you think has a greater probability of landing on its side than your first object.

X. Modifications

Special Education/ 504:	English Language Learners:
-Adhere to all modifications and health concerns stated in each IEP. -Give students a MENU options, allowing students to pick assignments from different levels based on difficulty. -Accommodate Instructional Strategies: reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), handouts, definition list with visuals, extended time -Allow students to demonstrate understanding of a problem by drawing the picture of the answer and then explaining the reasoning orally and/or writing , such as Read-Draw-Write -Provide breaks between tasks, use positive reinforcement, use proximity -Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum by using manipulatives -Implement supports for students with disabilities (click here) - Make use of strategies imbedded within lessons -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 17-18) - Strategies for students with 504 plans	- Use manipulatives to promote conceptual understanding and enhance vocabulary usage - Provide graphic representations, gestures, drawings, equations, realia, and pictures during all segments of instruction - During i-Ready lessons, click on “Español” to hear specific words in Spanish - Utilize graphic organizers which are concrete, pictorial ways of constructing knowledge and organizing information - Use sentence frames and questioning strategies so that students will explain their thinking/ process of how to solve word problems - Utilize program translations (if available) for L1/ L2 students - Reword questions in simpler language - Make use of the ELL Mathematical Language Routines (click here for additional information) -Scaffolding instruction for ELL Learners -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 16-17)
Gifted and Talented:	**Students at Risk for Failure:**
- Elevated contextual complexity - Inquiry based or open ended assignments and projects - More time to study concepts with greater depth - Promote the synthesis of concepts and making real world connections - Provide students with enrichment practice that are imbedded in the curriculum such as: ● Application / Conceptual Development ● Are you ready for more? - Provide opportunities for math competitions - Alternative instruction pathways available - Common Core Approach to Differentiate Instruction: Students with Disabilities (pg. 20)	- Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum - Modify Instructional Strategies, reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), inclusion of more visuals and manipulatives, Peer Support - Constant parental/ guardian contact - Provide academic contracts to students & guardians - Create an interactive notebook with samples, key vocabulary words, student goals/ objectives. - Plan to address students at risk in your learning tasks, instructions, and directions. Anticipate where the needs will be, then address them prior to lessons. -Common Core Approach to Differentiate Instruction: Students with Disabilities (pg 19)

21st Century Life and Career Skills:

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

https://www.state.nj.us/education/cccs/2014/career/9.pdf

- **CRP1**. Act as a responsible and contributing citizen and employee.
- **CRP2**. Apply appropriate academic and technical skills.
- **CRP3**. Attend to personal health and financial well-being.
- **CRP4**. Communicate clearly and effectively and with reason.
- **CRP5**. Consider the environmental, social and economic impacts of decisions.
- **CRP6**. Demonstrate creativity and innovation.
- **CRP7**. Employ valid and reliable research strategies.
- **CRP8**. Utilize critical thinking to make sense of problems and persevere in solving them.
- **CRP9**. Model integrity, ethical leadership and effective management.
- **CRP10**. Plan education and career paths aligned to personal goals.
- **CRP11**. Use technology to enhance productivity.
- **CRP12**. Work productively in teams while using cultural global competence.

Students are given an opportunity to communicate with peers effectively, clearly, and with the use of technical language. They are encouraged to reason through experiences that promote critical thinking and emphasize the importance of perseverance. Students are exposed to various mediums of technology, such as digital learning, calculators, and educational websites.

Technology Standards:

All students will be prepared to meet the challenge of a dynamic global society in which they participate, contribute, achieve, and flourish through universal access to people, information, and ideas.
https://www.state.nj.us/education/cccs/2014/tech/

8.1 Educational Technology:

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

A. **Technology Operations and Concepts:** Students demonstrate a sound understanding of technology concepts, systems and operations.
B. **Creativity and Innovation:** Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
C. **Communication and Collaboration:** Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
D. **Digital Citizenship:** Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
E. **Research and Information Fluency:** Students apply digital tools to gather, evaluate, and use of information.
F. **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.

8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

A. **The Nature of Technology: Creativity and Innovation-** Technology systems impact every aspect of the world in which we live.
B. **Technology and Society:** Knowledge and understanding of human, cultural, and societal values are fundamental when designing technological systems and products in the global society.
C. **Design:** The design process is a systematic approach to solving problems.
D. **Abilities in a Technological World:** The designed world in a product of a design process that provides the means to convert resources into products and systems.
E. **Computational Thinking: Programming-** Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Interdisciplinary Connections:	
English Language Arts:	
L.7.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
SL.7.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
W.7.1	Write arguments to support claims with clear reasons and relevant evidence.

XI. Core Instruction & Supplemental Resources

Core Instruction

ILLUSTRATIVE MATHEMATICS V. 2019
(OPEN UP RESOURCES)

GRADE	TEACHER RESOURCES	STUDENT RESOURCES
6	• **Teacher Edition: Unit 1-9** • Online Course Guide	• Student Workbook Set: Unit 1-9 • Online Student Access (Digital Applets)
7	• **Teacher Edition: Unit 1-9** • Online Course Guide	• Student Workbook Set: Unit 1-9 • Online Student Access (Digital Applets)
8	• **Teacher Edition: Unit 1-9** • Online Course Guide	• Student Workbook Set: Unit 1-9 • Online Student Access (Digital Applets)

5 Practices for Orchestrating Productive Mathematics Discussions

Anticipate

Consider how students might mathematically interpret a problem, the array of strategies—both correct and incorrect—that they might use to tackle it, and how those strategies and interpretations might relate to the mathematical concepts, representations, procedures, and practices that you would like the students to learn.

- Solve the problem yourself first. If possible work with colleagues.
- Ask yourself the following questions:
  - What strategies have students used in the past?
  - What representations are students most likely to use?
  - What incorrect or unproductive strategies are students likely to try?
  - What things might get in the way of students being able to engage with the problem? How can you remove those barriers?
  - What questions will you ask those who struggle?

Monitor

Pay close attention to students' mathematical thinking and solution strategies as they work on the task.

- Create a list of strategies the students may produce.
- Circulate the room. Watch and listen to students as they work.
- If any students use strategies you anticipated, write their name or group number on your list.
- Ask questions that will help students make their thinking visible.
- Ask questions that will help students clarify their thinking.
- Press students to consider aspects of the task to which they need to attend.

Select

Select particular students to share their work with the rest of the class to get specific mathematics into the open for discussion. The selection of particular students and their solutions is guided by the previously anticipated strategies and your assessment of how each approach will contribute to that goal.

- Based on the previously anticipated strategies and the mathematical goal of the activity, decide which student strategies to highlight.
- Select students who will share their work with the class.

Sequence

Make purposeful choices about the order in which students' work is shared to maximize the chances of achieving the mathematical goals for the discussion.

- Based on the mathematical goal, decide on the purpose for the sequence of work. For example: least efficient to most efficient, concrete to abstract, misconceptions to conceptions, or building representations.
- Decide in which order students will present their work.

Connect

Help students draw connections between their solutions and other students' solutions as well as the key mathematical ideas in the lesson. Help students to make judgments about the consequences of different approaches for the range of problems that can be solved, one's likely accuracy and efficiency in solving them, and the kinds of mathematical patterns that can be most easily discerned. Know where you want the discussion to "land" and make choices that are likely to get you there. If necessary, you may have to demonstrate an approach that students didn't come up with themselves.

- As students share, ask questions to elicit and clarify student thinking.
- After each student shares, ask questions to connect it to previously shared work or ask a student to summarize what another student said in their own words.
- Ask students to compare and contrast strategies or representations during the discussion.
- If students did not come up with an approach that you need them to see in order for the discussion to "land," demonstrate this approach and connect it to the work that students did.

IDEAL MATH BLOCK

Whole Group Instruction	55min	INSTRUCTION (Grades 3 – 8) Daily Routine: Mathematical Content or Language Routine (7 – 10 min) Anchor Task: Anticipate, Monitor, Select, Sequence, Connect Tech Integration: Digital applets embedded within lessons designed to enhance student learning Collaborative Work* Guided Learning/Guided Practice Independent Work (Demonstration of Student Thinking) Additional Activities / Let's Practice		
Rotation Stations (Student Notebooks & Chromebooks Needed)	1-2X 30 min	STATION 1: Focus on current Grade Level Content STUDENT EXPLORATION* Independent or groups of 2-3 Emphasis on MP's 3, 6 (Reasoning and Precision) And MP's 1 & 4 (Problem Solving and Application) TOOLS/RESOURCES Practice Problems Extra Practice/Enrichment Are you ready for more? Put Your Thinking Cap On	STATION 2: Focus on Student Needs TECH STATION Independent TECH INTEGRATION iReady - *i-Ready* delivers online lessons driven by student data to provide tailored instruction that meets students where they are in their learning trajectory. Dreambox (ELL) – Adaptive online learning platform.	TEACHER STATION: Focus on Grade Level Content; heavily scaffolded to connect deficiencies TARGETED INSTRUCTION 4 – 5 Students TOOLS/ RESOURCES Homework Manipulatives Reteach Workbook Transition Guide *all students seen in 2 weeks
Closure	5 min	INSTRUCTION Exit Ticket (Demonstration of Student Thinking) TOOLS/RESOURCES Notebooks or Exit Ticket Slips		

* Promotes discourse and collaboration

Supplemental Resources

Achieve the Core

Tasks - https://achievethecore.org/category/416/mathematics-tasks

Coherence Map - https://achievethecore.org/page/1118/coherence-map

Embarc

https://embarc.online/

Engage NY

https://www.engageny.org/ccss-library/?f%5B0%5D=field_subject%253Aparents_all%3A13601

iReady Digital Platform

https://login.i-ready.com/

Illustrative Mathematics

Content Standard Tasks - https://tasks.illustrativemathematics.org/content-standards

Practice Standard Tasks - https://tasks.illustrativemathematics.org/practice-standards

Open Up Resources - https://access.openupresources.org/sign_in

iM Additional Resources - https://bit.ly/imshare

Khan Academy

https://www.khanacademy.org/math/illustrative-math

NJDOE Digital Item Library

https://nj.digitalitemlibrary.com/home?subject=Math

Ready Teacher Toolbox

https://teacher-toolbox.com/