

Mathematics

7th Grade Math Standard 1.1

[7.Math.1.1](#) Proportional reasoning involves comparisons and multiplicative relationships among ratios

Essential Questions - 21st Century Skills and Readiness Competencies:	Evidence Outcomes:
<ol style="list-style-type: none"> 1. What information can be determined from a relative comparison that cannot be determined from an absolute comparison? 2. What comparisons can be made using ratios? 3. How do you know when a proportional relationship exists? 4. How can proportion be used to argue fairness? 5. When is it better to use an absolute comparison? 6. When is it better to use a relative comparison? 7. How does using ratios, rates, and proportions allow for sound decision-making in daily life? 8. What information can we get from ratios, rates, and proportions? 9. How is proportional reasoning used in the work place? 	<ol style="list-style-type: none"> 1. Analyze proportional relationships and use them to solve real-world and mathematical problems. 2. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. 3. Identify and represent proportional relationships between quantities. <ol style="list-style-type: none"> a. Determine whether two quantities are in a proportional relationship. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate. 4. Use proportional relationships to solve multi-step ratio and percent problems. <ol style="list-style-type: none"> a. Estimate and compute unit cost of consumables (to include unit conversions if necessary) sold in quantity to make purchase decisions based on cost and practicality. b. Solve problems involving percent of a number, discounts, taxes, simple interest, percent increase, and percent decrease.

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<p>Academic Vocabulary:</p> <p>proportion ratio unit rate percent rate unit cost absolute comparison equation relative comparison unit conversion interest tax</p>	<p>Assessment: All assessments are found in the suggested activities links, correlating with their numbers, unless listed below.</p> <ol style="list-style-type: none"> 1. Assess this lesson with the activity Design on a Dime performance task, pp. 27- 32. 2. Use the What's Your Rate worksheets and assessment questions included in the lesson. 3. Assessment will be reasonableness of the answer. 4. Use the In Your Shadow worksheets and assessment questions included in the lesson. 5. Assessments of Ratio, Rate, and Proportion are located in lesson plans, pp. 5-14. 6. Use the Thirsty for Ratios Assessment link. <p>2. What's Your Rate 4. In Your Shadow 6. Thirsty for Ratios Assessment</p>
<p>Suggested Activities/Strategies:</p> <p>For all activities listed below, the links are numbered to correlate with each activity.</p> <ol style="list-style-type: none"> 1. Use the Proportion Unit Lesson Plan where students will discover how everyday situations can be represented mathematically through proportional relationships. 2. Use the Measure Up: What's Your Rate? Activity where students learn to write and solve proportions by gathering data and calculating unit rates. 3. Use the Figure This Activity where individuals measure the length of their nose and their arms. 	<p>Resources/Technology:</p> <p>PARCC offers instructional and assessment support. Click on the tab "In the Classroom" and at the model frameworks for math.</p> <p>Illustrative Mathematics contains examples of tasks designed by the makers of the CCSS-M (Common Core State Standards of Mathematics.)</p> <p>Inside Mathematics has tasks, rubrics, and discussion questions that correlate with PARCC and Smarter Balance.</p> <p>Math Arizona has explanations and overviews for how the mathematics strands progress from one year to the next.</p>

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4. In the Measure Up: In Your Shadow Lesson, students extend their knowledge of proportions to solve problems of similarity.

5. Use the Ratio, Rate, Proportion Lesson Plan for students to compare quantities using ratios, rates, and proportions.

6. In the Thirsty for Ratios Lesson Plan, the students will learn what a ratio is and how it can be used in comparison.

7. Use the Ratio/Rate Lesson Plan to teach how a ratio expresses the comparison between two quantities.

8. If you have a Smart Board or Airliner, go to [Smart Exchange](#) and choose from a selection of free lessons.

9. Go to [Share My Lesson](#) and choose from a variety of lessons over Percent, Ratios, Rates, etc.

[1. Proportion Unit Lesson Plan](#)

[2. What's Your Rate](#)

[3. Figure This](#)

[4. In Your Shadow](#)

[5. Ratio, Rate, Proportion Lesson Plan](#)

[6. Thirsty for Ratios](#)

[6. Thirsty for Ratios: Scaling Ratios](#)

[6. Thirsty for Ratios: Proper Mixtures](#)

[7. Ratio/Rate Lesson Plan](#)

[8. Smart Exchange](#)

[9. Share My Lesson](#)

[Math Shell](#) is Mathematics Assessment Resource Service (MARS) from the Shell Centre in Nottingham, England and it contains a number of performance tasks.

[Achieve the Core](#) is from Student Achievement Partners, a nonprofit organization that assembles educators and researchers to design actions based in evidence that will substantially improve student achievement.

[Balanced Assessments](#) is a site with free performance tasks to use in your classroom.

[Brain Camp Interactive Game Site](#)

[Slope and Rate of Change](#)

[Rate of Change Practice Problems](#)

[Straight Line and Slope](#)

[Unit Rate Interactive Games](#)

[Math Games](#)

[Proportional Reasoning Lesson Plan](#)

[Review of Ratios](#)

[Math Village](#)

[Radio Blaster Ratio Game](#)

[Link to Multiple Games](#)

[Math Games with Ratios](#)

[Better Lesson Site with Multiple Resources](#)

[Percent Practice Problems](#)

[Video on Percent Problems](#)

Mathematics

7th Grade Math Standard 1.2

[7.Math.1.2](#) Formulate, represent, and use algorithms with rational numbers flexibly, accurately, and efficiently

Essential Questions - 21st Century Skills and Readiness Competencies:	Evidence Outcomes:
<p>1. How do operations with rational numbers compare to operations with integers?</p> <p>2. How do you know if a computational strategy is sensible?</p> <p>3. How is 0.9 equal to one? How is 0.9 not equal to one?</p> <p>4. How do you know whether a fraction can be represented as a repeating or terminating decimal?</p> <p>5. How can we formulate, represent, and use algorithms with rational numbers flexibly, accurately, and efficiently?</p> <p>6. Why is zero always the sum of a number and its opposite?</p> <p>7. How can you represent addition and subtraction on a horizontal or vertical number line diagram?</p> <p>8. How can you demonstrate $p + q$ as the number located a distance q from p in the positive or negative direction depending on whether it is positive or negative?</p> <p>9. How can you demonstrate subtraction of rational numbers by adding the additive inverse?</p> <p>10. How can you use long division to convert a fraction to a decimal?</p>	<p>1. Apply understandings of addition and subtraction to add and subtract rational numbers including integers.</p> <p>a. Represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>b. Describe situations in which opposite quantities combine to make zero.</p> <p>c. Demonstrate $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative.</p> <p>d. Show that a number and its opposite have a sum of zero (are additive inverses).</p> <p>e. Interpret sums of rational numbers by describing real-world contexts.</p> <p>f. Demonstrate subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$.</p> <p>g. Show that the distance between two rational numbers on the number line is the absolute value of their difference and apply this principle in real-world contexts.</p> <p>h. Apply properties of operations as strategies to add and subtract rational numbers.</p>

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	<p>2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers including integers.</p> <p>a. Apply properties of operations to multiplication of rational numbers.</p> <p>b. Interpret products of rational numbers by describing real-world contexts.</p> <p>c. Apply properties of operations to divide integers.</p> <p>d. Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>e. Convert a rational number to a decimal using long division.</p> <p>f. Show that the decimal form of a rational number terminates in zeros or eventually repeats.</p> <p>3. Solve real-world and mathematical problems involving the four operations with rational numbers.</p>
<p>Academic Vocabulary:</p> <p>additive inverse negative number number line diagram sum rational number absolute value fraction integer properties of operations variables irrational numbers</p>	<p>Assessment:</p> <p>All assessments are found in the suggested activities links, correlating with their numbers, unless listed below.</p> <p>1. Use the Elevator Arithmetic as assessment</p> <p>2 & 3. Grade the worksheets as assessment</p> <p>4. Create and grade worksheets made using the worksheet maker link in Resources.</p> <p>5. Use the Zip, Zilch, Zero Game Assessment.</p> <p>6. There are multiple opportunities throughout the PowerPoint to assess students.</p>

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	<p>7 & 8. Assessments are built into each lesson.</p> <p>1. Elevator Arithmetic Assessment</p> <p>5. Zip, Zilch, Zero Assessment</p>
<p>Suggested Activities/Strategies:</p> <p>For all activities listed below, the links are numbered to correlate with each activity.</p> <ol style="list-style-type: none"> 1. Use the Elevator Arithmetic Lesson Plan where students will use the vertical movement of an elevator to evaluate signed number expressions. 2. Demonstrate addition and subtraction on a number line. 3. Use Drill and Practice Worksheets for extra practice. Several would work for homework and/or extra classwork. 4. Play the Zip, Zilch, Zero Game for adding and subtracting integers. 5. Use the Multiplication/Division of Integers PowerPoint to introduce how to multiply and divide integers. 6. Go to Smart Exchange and choose from a variety of free lessons. 7. Go to Share My Lesson and choose from several lessons over these standards. <p>1. Elevator Arithmetic Lesson Plan</p> <p>2. Number Line Activity</p> <p>3. Drill and Practice Worksheet Website</p> <p>4. Zip, Zilch, Zero Game</p> <p>5. Integer PowerPoint</p> <p>6. Smart Exchange</p> <p>7. Share My Lesson</p>	<p>Resources/Technology:</p> <p>PARCC offers instructional and assessment support. Click on the tab "In the Classroom" and at the model frameworks for math.</p> <p>Illustrative Mathematics contains examples of tasks designed by the makers of the CCSS-M (Common Core State Standards of Mathematics.)</p> <p>Inside Mathematics has tasks, rubrics, and discussion questions that correlate with PARCC and Smarter Balance.</p> <p>Math Arizona has explanations and overviews for how the mathematics strands progress from one year to the next.</p> <p>Math Shell is Mathematics Assessment Resource Service (MARS) from the Shell Centre in Nottingham, England and it contains a number of performance tasks.</p> <p>Achieve the Core is from Student Achievement Partners, a nonprofit organization that assembles educators and researchers to design actions based in evidence that will substantially improve student achievement.</p> <p>Balanced Assessments is a site with free performance tasks to use in your classroom.</p> <p>Math Games</p> <p>Math is Fun Integer Game</p> <p>Integers Worksheets</p>

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	<u>Integer Interactive Game</u> <u>YouTube Video on Adding/Subtracting Integers</u> <u>YouTube Video on Changing Rational Numbers to Decimals</u> <u>Examples of Rational Numbers to Decimals</u> <u>How to Convert Rational Numbers</u> <u>Examples of Real World Problems</u> <u>Real World Problems Video</u> <u>Adding and Subtracting Integers</u>
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Mathematics

7th Grade Math Standard 2.1

[7.Math.2.1](#) Properties of arithmetic can be used to generate equivalent expressions

<p>Essential Questions - 21st Century Skills and Readiness Competencies:</p> <ol style="list-style-type: none"> 1. How do symbolic transformations affect an equation or expression? 2. How is it determined that two algebraic expressions are equivalent? 3. How can the property of arithmetic be used to generate equivalent expressions? 4. How can rewriting a problem in a different form help to understand a problem better? 	<p>Evidence Outcomes:</p> <ol style="list-style-type: none"> 1. Use properties of operations to generate equivalent expressions. <ol style="list-style-type: none"> a. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. b. Demonstrate that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
<p>Academic Vocabulary:</p> <p>coefficients equivalent factor linear expressions algebraic expressions associative property commutative property identity property distributive property</p>	<p>Assessment:</p> <p>All assessments are found in the suggested activities links, correlating with their numbers, unless listed below.</p> <ol style="list-style-type: none"> 1. Create and use worksheets for assessment. 2. The Calendar Fun Assessment is in the Lesson Plan. 3, 4, 5, & 6. Assessments are located within the different lessons. <p>1. Worksheet Maker 2. Calendar Fun</p>
<p>Suggested Activities/Strategies:</p> <p>For all activities listed below, the links are numbered to correlate with each activity.</p> <ol style="list-style-type: none"> 1. Conduct Drill and Practice with worksheets. 2. Use the Calendar Fun Order of Operations Activity to help students evaluate numerical expressions by using order of operations. 3. Go to Smart Exchange and choose from a variety of free lessons. 	<p>Resources/Technology:</p> <p>PARCC offers instructional and assessment support. Click on the tab "In the Classroom" and at the model frameworks for math.</p> <p>Illustrative Mathematics contains examples of tasks designed by the makers of the CCSS-M (Common Core State Standards of Mathematics.)</p> <p>Inside Mathematics has tasks, rubrics, and discussion questions that correlate with</p>

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4. Go to [Share My Lesson](#) and choose from a variety of lessons.
5. Use the Water Park Lesson Plan where students create a blueprint for a water park.
6. Use the Amazing Profit Lesson Plan. Students will use equations to determine eBay profit on new technology.

[1. Links to Multiple Worksheets](#)

[1. Algebra Worksheets](#)

[2. Calendar Fun](#)

[3. Smart Exchange](#)

[4. Share My Lesson](#)

[5. Water Park Lesson](#)

[6. Amazing Profit Lesson Plan](#)

PARCC and Smarter Balance.

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[Balanced Assessments](#) is a site with free performance tasks to use in your classroom.

[Math Games](#)

[Combining Terms Video](#)

[Apply Operations Resources](#)

[YouTube Video on Expanding Linear Equations](#)

[YouTube Video #2 Combining Like Terms](#)

[Linear Equation Graphic Organizer](#)

[Interactive Number Line Game](#)

[Interactive Equation Solver](#)

[Order of Operations Tool](#)

[Order of Operations Tool with Integers](#)

[Think Pair Share Video Activity](#)

[Multiple Resources](#)

[Links for How to Rewrite Problems](#)

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7th Grade Math Standard 2.2

[7.Math.2.2](#) Equations and expressions model quantitative relationships and phenomena

<p>Essential Questions - 21st Century Skills and Readiness Competencies:</p> <ol style="list-style-type: none"> 1. Do algebraic properties work with numbers or just symbols? Why? 2. Why are there different ways to solve equations? 3. How are properties applied in other fields of study? 4. Why might estimation be better than an exact answer? 5. When might an estimate be the only possible answer? 6. What is the difference between an algebraic solution and an authentic solution? 7. How can you graph the solution set of an inequality? 8. When shopping for large ticket items (car, house, etc.) how would you determine interest, payments, etc.? 9. How could you solve a real life word problem using the $px + q = r$ format? 	<p>Evidence Outcomes:</p> <ol style="list-style-type: none"> 1. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. 2. Apply properties of operations to calculate with numbers in any form, convert between forms as appropriate, and assess the reasonableness of answers using mental computation and estimation strategies. 3. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. 4. Fluently solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. 5. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. 6. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. 7. Graph the solution set of the inequality and interpret it in the context of the problem.
<p>Academic Vocabulary:</p> <p>positive numbers negative numbers rational numbers estimate variable inequalities equations</p>	<p>Assessment:</p> <p>All assessments are found in the suggested activities links, correlating with their numbers, unless listed below.</p> <ol style="list-style-type: none"> 1. Use link below for an Order of Operations Quiz. 2. The Order of Operation Bingo has

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<p>symbol</p>	<p>assessments on the site. Use the Bingo sheets below as well.</p> <p>3. The BrainPop site has assessments. Create an assessment to follow the other two videos listed, if you do not have a subscription to BrainPop.</p> <p>4. In the Tic-Tac-Toe Game, assess as the students correctly solve the problems.</p> <p>5. In Skate Party, the single variable real world problems assessment is located within the lesson.</p> <p>6 & 7. Assessments are built into the lessons.</p> <p>1. Order of Operations Quiz</p> <p>2. Bingo Cards</p> <p>5. Skate Party Assessment</p>
<p>Suggested Activities/Strategies:</p> <p>For all activities listed below, the links are numbered to correlate with each activity.</p> <ol style="list-style-type: none"> 1. Make your own Order of Operations worksheets. 2. Play Order of Operations Bingo. Instead of calling numbers to play Bingo, call (and students write) expressions to be evaluated for the numbers on the Bingo cards. 3. Watch the Order of Operations BrainPop Movie, but you must have a subscription. Or watch the Order Of Operations Video from the mathplayground.com link below. 4. Play the Tic-Tac-Toe Game as a new approach to working with variables and equations. 5. Use the Skate Party Activity for teaching single variable real world problems. 	<p>Resources/Technology:</p> <p>PARCC offers instructional and assessment support. Click on the tab "In the Classroom" and at the model frameworks for math.</p> <p>Illustrative Mathematics contains examples of tasks designed by the makers of the CCSS-M (Common Core State Standards of Mathematics.)</p> <p>Inside Mathematics has tasks, rubrics, and discussion questions that correlate with PARCC and Smarter Balance.</p> <p>Math Arizona has explanations and overviews for how the mathematics strands progress from one year to the next.</p> <p>Math Shell is Mathematics Assessment Resource Service (MARS) from the Shell Centre in Nottingham, England and it contains a number of performance tasks.</p>

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<p>6. On the Share My Lesson site, there are numerous multi-step word problem lessons from which to choose.</p> <p>7. Smart Exchange has several free lessons from which to choose.</p> <ol style="list-style-type: none">1. Create Your Own Worksheets1. Make Your Own Worksheets2. Order of Operations Bingo Lesson Plan3. BrainPop Link3. Math Playground Video3. Kahn Academy Order of Operations Video4. Tic-Tac-Toe Lesson Plan5. Skate Party Lesson6. Share My Lesson7. Smart Exchange	<p>Achieve the Core is from Student Achievement Partners, a nonprofit organization that assembles educators and researchers to design actions based in evidence that will substantially improve student achievement.</p> <p>Balanced Assessments is a site with free performance tasks to use in your classroom.</p> <p>Site for Word Problems</p> <p>Teacher Resource for Order of Operations</p> <p>Fridge Formula Activity</p> <p>Math Games</p> <p>YouTube Video on Solving Real World Equations</p> <p>Multiple Links to Games</p> <p>Algebra to Arithmetic</p>
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Mathematics

7th Grade Math Standard 3.1

[7.Math.3.1](#) Statistics can be used to gain information about populations by examining samples

<p>Essential Questions - 21st Century Skills and Readiness Competencies:</p> <ol style="list-style-type: none"> 1. How might the sample for a survey affect the results of the survey? 2. How do you distinguish between random and biased samples? 3. How can you declare a winner in an election before counting all the ballots? 4. How can statistics be used to gain information? 5. How can random sampling produce representative samples and support valid inferences? 6. How do visuals help you to understand the mathematical differences in representations of two populations? 7. What is the difference between measure of center and measure of variability for numerical data? 	<p>Evidence Outcomes:</p> <ol style="list-style-type: none"> 1. Use random sampling to draw inferences about a population. 2. Explain that generalizations about a population from a sample are valid only if the sample is representative of that population. 3. Explain that random sampling tends to produce representative samples and support valid inferences. 4. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. 5. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. 6. Draw informal comparative inferences about two populations. 7. 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. 8. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
<p>Academic Vocabulary:</p> <p>inference statistic variability generalization sampling estimate data sample</p>	<p>Assessment:</p> <p>All assessments are found in the suggested activities links, correlating with their numbers, unless listed below.</p>

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<p>bias random valid</p>	<p>1. Evaluate whether each student’s bar graphs are properly constructed and properly display the survey responses. Ask students to write a paragraph discussing their findings and describing how this new information should be incorporated into community planning.</p> <p>2. Determine that the measurements are accurate and the map is to scale.</p> <p>3, 4, & 5. Questions in the lesson will be answered orally or in writing.</p> <p>6 & 7. Assessments are built into each lesson.</p>
<p>Suggested Activities/Strategies:</p> <p>For all activities listed below, the links are numbered to correlate with each activity.</p> <ol style="list-style-type: none"> 1. Use the Community Survey Activity wherein students will gain interviewing skills and discover the variety of values and opinions held by different people in the community through conducting a survey of different age groups. 2. Use the School Survey Map Activity to help students understand the importance and mechanics of making a land survey grid by measuring, marking, and notetaking. 3. Use the Population Sampling Activity for teaching how to estimate population by using population sampling activities. 4. Use the Backpack Sample Population and Bias Activity. Students will examine pre-existing data pertaining to the color of backpacks used by high school freshmen for a statistical study. 	<p>Resources/Technology:</p> <p>PARCC offers instructional and assessment support. Click on the tab "In the Classroom" and at the model frameworks for math.</p> <p>Illustrative Mathematics contains examples of tasks designed by the makers of the CCSS-M (Common Core State Standards of Mathematics.)</p> <p>Inside Mathematics has tasks, rubrics, and discussion questions that correlate with PARCC and Smarter Balance.</p> <p>Math Arizona has explanations and overviews for how the mathematics strands progress from one year to the next.</p> <p>Math Shell is Mathematics Assessment Resource Service (MARS) from the Shell Centre in Nottingham, England and it contains a number of performance tasks.</p> <p>Achieve the Core is from Student Achievement Partners, a nonprofit organization that assembles educators and researchers to design actions based in evidence that will substantially improve student achievement.</p>

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5. Use the Population Sampling Lab Activity. To get a better understanding of the community of organisms living within an ecosystem, ecologists take random samples to gain a representation of what relationships exist in a certain area.

6. There are a variety of free lessons to choose from at [Smart Exchange](#).

7. The [Share My Lesson](#) site has multiple 21st Century lessons.

[1. Community Survey Activity](#)

[2. School Survey Activity](#)

[3. Population Sampling Activity](#)

[4. Backpack Activity](#)

[5. Population Sampling Lab Activity](#)

[6. Smart Exchange](#)

[7. Share My Lesson](#)

[Balanced Assessments](#) is a site with free performance tasks to use in your classroom.

[Math Games](#)

[Measure of Center Worksheet](#)

[Measure of Center PowerPoint](#)

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7th Grade Math Standard 3.2

[7.Math.3.2](#) Mathematical models are used to determine probability

Essential Questions - 21st Century Skills and Readiness Competencies:

1. Why is it important to consider all of the possible outcomes of an event?
2. Is it possible to predict the future? How?
3. What are some situations in which probability cannot be used?
4. How can you determine probability using mathematical models?
5. What is the probability of a chance event?
6. How can you use a probability model to help find the probability of an event?
7. How can organized lists, tables, tree diagrams, and simulations help find the probabilities of compound events?
8. What are compound events?

Evidence Outcomes:

- a. Explain that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.
- b. 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.
- c. Develop a probability model and use it to find probabilities of events.
- d. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
- e. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
- f. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
- g. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
- h. Explain that the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
- i. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams.

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	<p>j. For an event described in everyday language identify the outcomes in the sample space which compose the event.</p> <p>k. Design and use a simulation to generate frequencies for compound events.</p>
<p>Academic Vocabulary:</p> <p>compound event probability relative frequency model discrepancy outcome sample spaces simulation</p>	<p>Assessment: All assessments are found in the suggested activities links, correlating with their numbers, unless listed below.</p> <ol style="list-style-type: none"> 1. Some games have assessments included. 2. Use the online probability quiz (CRCT). 3. Students will write a paragraph on probability after experimenting with the virtual roll of the die program. A rubric is included for grading paragraphs. 4. Use the online probability quiz (Bitesize). 5 & 6. Assessments are located within each lesson. <p>2. Online Probability Quiz (CRCT) 3. Paragraph Rubric 4. Online Probability Quiz (Bitesize)</p>
<p>Suggested Activities/Strategies:</p> <p>For all activities listed below, the links are numbered to correlate with each activity.</p> <ol style="list-style-type: none"> 1. Play the Probability Games. To make lessons on probability more amusing, figure out ways to relate probability projects to familiar games with which children can identify. 2. Watch the Compound Events Video. In this lesson, students learn how to find the probability of compound events by watching an online video, taking an online quiz, and playing a fun online game. 	<p>Resources/Technology:</p> <p>PARCC offers instructional and assessment support. Click on the tab "In the Classroom" and at the model frameworks for math.</p> <p>Illustrative Mathematics contains examples of tasks designed by the makers of the CCSS-M (Common Core State Standards of Mathematics.)</p> <p>Inside Mathematics has tasks, rubrics, and discussion questions that correlate with PARCC and Smarter Balance.</p>

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3. Experiment with a virtual roll of the die. In this interactive, there is a strong explanation of how probability works under the graph.

4. Play a probability game on Bitesize.

5. If you have a Smart Board or Airliner, go to [Smart Exchange](#) and choose from variety of lessons on probability.

6. Go to [Share My Lesson](#) and choose from a variety of probability lessons.

[1. Probability Games \(Multiple Examples\)](#)

[2. Compound Probability of Events Video](#)

[3. Experiment with the Roll of a Die Interactive](#)

[4. Bitesize Probability Game](#)

[5. Smart Exchange](#)

[6. Share My Lesson](#)

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[Balanced Assessments](#) is a site with free performance tasks to use in your classroom.

[Math Games](#)

[Probability Games](#)

[Probability PowerPoint](#)

[Probability Tree Diagram Handout](#)

[YouTube Video on Compound Probability](#)

[Multiple Games](#)

[YouTube Video on Developing Probability Models](#)

[Multiple Interactive Links](#)

Mathematics

7th Grade Math Standard 4.1

[7.Math.4.1](#) Modeling geometric figures and relationships leads to informal spatial reasoning and proof

<p>Essential Questions - 21st Century Skills and Readiness Competencies:</p> <ol style="list-style-type: none"> 1. Is there a geometric figure for any given set of attributes? 2. How does scale factor affect length, perimeter, angle measure, area, and volume? 3. How do you know when a proportional relationship exists? 4. How can you describe two-dimensional figures that result from slicing three-dimensional figures? 5. How can you construct triangles from three measures of angles or sides? 6. What does drawing to scale mean? 7. What type of conditions determine a unique triangle, more than one triangle, or no triangle based on measurements? 	<p>Evidence Outcomes:</p> <ol style="list-style-type: none"> a. Draw, construct, and describe geometrical figures and describe the relationships between them. b. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. c. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. d. Construct triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. e. Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
<p>Academic Vocabulary:</p> <p>plane section attributes geometrical figures scale drawings protractor rectangular prisms rectangular pyramids</p>	<p>Assessment:</p> <p>All assessments are found in the suggested activities links, correlating with their numbers, unless listed below.</p> <ol style="list-style-type: none"> 1. Polygon Activity interactive rubric for poster 2. Cross Sections of 3D Shapes worksheet 3. Teacher assessment throughout lesson 4. Drawing Your Body to scale is the assessment 5. Triangle assessment 6. The students will be assessed based on the

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	<p>accuracy of answers given on the lesson attachment.</p> <p>1. Polygon Poster Rubric 2. Cross Sections of 3-D Shapes Worksheet 4. Drawing Your Body to Scale Rubric 5. Investigating Triangles 6. Triangle Assessment</p>
<p>Suggested Activities/Strategies:</p> <p>For all activities listed below, the links are numbered to correlate with each activity.</p> <ol style="list-style-type: none"> 1. In the Polygon Activity, the student will be able to create a poster comprised of at least four different polygons. 2. Use the Cross Sections of 3D Shapes Lesson for developing the concepts of cross-sections of three-dimensional models and to demonstrate the derivation of two-dimensional shapes. 3. Use Play-Doh Activity to teach volume. Uses Play-Doh to create 3D shapes to measure figures and to find the volume. 4. Use the Body to Scale Lesson Plan. Students use scale factors to draw their bodies to scale. 5. The Investigating Triangles Activity is for recognizing and understanding the properties of triangles and their positions in space. 6. Use the Constructing Triangles Lesson Plan. The purpose of this lesson is to help students investigate the relationships of the lengths of the sides of a triangle in order to discover the three triangle inequality theorems. 	<p>Resources/Technology:</p> <p>PARCC offers instructional and assessment support. Click on the tab "In the Classroom" and at the model frameworks for math.</p> <p>Illustrative Mathematics contains examples of tasks designed by the makers of the CCSS-M (Common Core State Standards of Mathematics.)</p> <p>Inside Mathematics has tasks, rubrics, and discussion questions that correlate with PARCC and Smarter Balance.</p> <p>Math Arizona has explanations and overviews for how the mathematics strands progress from one year to the next.</p> <p>Math Shell is Mathematics Assessment Resource Service (MARS) from the Shell Centre in Nottingham, England and it contains a number of performance tasks.</p> <p>Achieve the Core is from Student Achievement Partners, a nonprofit organization that assembles educators and researchers to design actions based in evidence that will substantially improve student achievement.</p> <p>Balanced Assessments is a site with free performance tasks to use in your classroom.</p>

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1. Polygon Activity	Math Games
2. Cross Sections of 3-D Shapes	Geometric Patterns
3. Play-Doh Activity	Drawing Geometric Shapes Video
4. Drawing Your Body to Scale	Visualizing Geometry Video
5. Investigating Triangles	Drawing Triangles with a Compass and Straight Edge Animation
6. Constructing Triangles Lesson Plan	Scale Drawing
	Drawing to Scale Lessons
	Interactive Triangles Site
	Constructing Triangles Site

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[7.Math.4.2](#) Linear measure, angle measure, area, and volume are fundamentally different and require different units of measure

<p>Essential Questions - 21st Century Skills and Readiness Competencies:</p> <ol style="list-style-type: none"> 1. How can geometric relationships among lines and angles be generalized, described, and quantified? 2. How do line relationships affect angle relationships? 3. Can two shapes have the same volume but different surface areas? Why? 4. Can two shapes have the same surface area but different volumes? Why? 5. Compare and Contrast Surface Area and Volume. 6. What do surface area and volume tell about an object? 7. How are one-, two-, and three-dimensional units of measure related? 8. Why is pi an important number? 	<p>Evidence Outcomes:</p> <ol style="list-style-type: none"> a. State the formulas for the area and circumference of a circle and use them to solve problems. b. Give an informal derivation of the relationship between the circumference and area of a circle. c. Use properties of supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. d. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
<p>Academic Vocabulary:</p> <p>area circumference derivation supplementary angles complementary angles vertical angles adjacent angles</p>	<p>Assessment:</p> <p>All assessments are found in the suggested activities links, correlating with their numbers, unless listed below.</p> <ol style="list-style-type: none"> 1. In an "A" Peeling Problem, the assessment is in the lesson (pp. 6-7). 2. Online circle and angle tools have "Exploration" questions above them that may be used as assessment and discussion. 3. In the Getting "A-Round" Area Teacher Notes, answers to the Student Activity could be used as the assessment 4. Nifty Nets Rubric for assessment

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	<p>5. Interactive online assessment of 3D shapes</p> <p>6. Assessment throughout lesson</p> <p>7. Ping Pong Rubric</p> <p>8. Teacher observation as the assessment</p> <p>3. Getting "A-Round" Area Teacher Notes</p> <p>4. Nifty Nets Rubric</p> <p>5. Interactive 3-D Shapes</p> <p>7. Ping Pong Rubric</p>
<p>Suggested Activities/Strategies:</p> <p>For all activities listed below, the links are numbered to correlate with each activity.</p> <ol style="list-style-type: none"> 1. An "A" Peeling Problem Lesson covers the area of circles and spheres. 2. Use online tools to explore circles and angles. 3. Getting "A-Round" Area contains a useful animation for teaching the area of a circle. Student activity sheet is included. 4. Nifty Nets is a lesson on the volume and surface area of prisms. 5. Interactive 3D shapes contains both online and print and fold options. 6. Use the Play-Doh Activity to explore volume. 7. Use the Ping Pong Madness to teach volume. 8. Play 3D Shapes Dominoes. 	<p>Resources/Technology:</p> <p>PARCC offers instructional and assessment support. Click on the tab "In the Classroom" and at the model frameworks for math.</p> <p>Illustrative Mathematics contains examples of tasks designed by the makers of the CCSS-M (Common Core State Standards of Mathematics.)</p> <p>Inside Mathematics has tasks, rubrics, and discussion questions that correlate with PARCC and Smarter Balance.</p> <p>Math Arizona has explanations and overviews for how the mathematics strands progress from one year to the next.</p> <p>Math Shell is Mathematics Assessment Resource Service (MARS) from the Shell Centre in Nottingham, England and it contains a number of performance tasks.</p> <p>Achieve the Core is from Student Achievement Partners, a nonprofit organization that assembles educators and researchers to design actions based in evidence that will substantially improve student achievement.</p>

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9. Smart Exchange has multiple lessons to choose from if you have a SmartBoard or Airliner.

10. Share My Lesson has multiple lessons from which to choose.

[1. An A-Peeling Problem](#)

[2. Angle Tool](#)

[2. Circle Tool](#)

[3. Getting "A-Round" Area Student Activity](#)

[3. Getting "A-Round" Area Animation and Lesson](#)

[4. Nifty Nets](#)

[4. Nifty Nets Project Guide](#)

[5. Interactive 3-D Shapes](#)

[6. Play-Doh Activity to Teach Volume](#)

[7. Ping Pong Packages](#)

[8. Nets Dominoes](#)

[9. Smart Exchange](#)

[10. Share My Lesson](#)

[Balanced Assessments](#) is a site with free performance tasks to use in your classroom.

[Math Games](#)

[Net Worksheets](#)

[Net PowerPoint](#)

[3-D Shapes PowerPoint](#)

[Mini-Surface Area Unit](#)