MS - Math 7

Huntingdon Area School District

UNITS (14/14 SELECTED)	SUGGESTED DURATION
🟩 Unit 1: Proportional Relationships	*6 lessons*
🟦 Unit 2: Solve Percent Problems	*7 lessons*
🟥 Unit 3: Operations with Integers	*5 lessons*
⬛ Unit 4: Operations With Rational Numbers	*6 lessons*
🟧 Unit 5: Simplify Algebraic Expressions	*5 lessons*
🟪 Unit 6: Write and Solve Equations	*5 lessons*
🟩 Unit 7: Write and Solve Inequalities	*6 lessons*
🟧 Unit 8: Geometric Figures	*5 lessons*
🟥 Unit 9: Measure Figures	*6 lessons*
🟧 Unit 10: Probability	*6 lessons*
🟦 Unit 11: Sampling and Statistics	*5 lessons*
🟩 Unit 12: Spaced Learning Over Time (SLOT)	*25 lessons*
🟪 Unit 13: Interleaved Practice Format (IPF)	*12 lessons*
🟪 Unit 14: Spring Math	*26 lessons*

Unit 1: Proportional Relationships
MS - Math 7

UNIT OVERVIEW

Analyze multiple representation of proportional relationships (tables, graphs, and equations.)

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

| M07.A-R.1.1 | M07.A-R.1.1.1 | M07.A-R.1.1.2 | M07.A-R.1.1.3 | M07.A-R.1.1.4 | M07.A-R.1.1.5 |

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.1.7.D.1

BIG IDEAS

Big Ideas

- **Unit Rates Involving Ratios of Fractions**
- **Understand Proportional Relationships**
- **Tables of Proportional Relationships**
- **Graphs of Proportional Relationships**
- **Equations of proportional Relationships**
- **Solve Problems Involving Proportional Relationships**

ESSENTIAL QUESTIONS

Essential Questions

- What does it mean for two quantities to be in a proportional relationships

Unit 1: Proportional Relationships

MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will know how to use bar diagrams to explore diagrams to explore how to find a unit rate when one or both quantities of a given rate are fractions.	Students can find unit rates when one or both quantities are fractions.
Students will know what makes a relationship between two quantities a proportional relationship.	Students can use models and ratio reasoning to understand how a proportional relationship can exist between quantities.
Students will know how to use a table to explore how to determine if the ratios between two quantities are equivalent.	Students can analyze the relationship between two quantities represented in tables to determine proportionality.
Students will know how to explore the graphs of proportional and nonproportional linear relationships.	Students can analyze the relationship between two quantities graphed on a coordinate plane to determine pro
Students will know how to explore the equations of proportional relationships.	Students can write equations to represent proportional relationships.
Students will know how to make a table, use a graph, or write an equation to solve problems involving proportional relationships.	Students can solve problems involving proportional relationships.

Unit 1: Proportional Relationships

MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 2: Solve Percent Problems
MS - Math 7

Solve multi-step percent problems.

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

M07.A-R.1.1   M07.A-R.1.1.6   M07.B-E.2.1   M07.B-E.2.1.1

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.1.7.D.1   CC.2.2.7.B.3

BIG IDEAS

Big Ideas

- **Percent of Change**
- **Tax**
- **Tips and Markup**
- **Discounts**
- **Interest**
- **Commission and Fees**
- **Percent Error**

ESSENTIAL QUESTIONS

Essential Questions

- How can a percent describe the change of a quantity

Unit 2: Solve Percent Problems

MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will know how to use bar diagrams to explore percent of change.	Students can solve problems involving percent of increase and percent of decrease.
Students will know how sales tax rate affects the total cost of an item.	Students can solve multi-step ratio and percent problems involving taxes.
Students will know that tips are based on a percent of the amount charged when a service provided.	Students can solve multi-step ratio and percent problems involving tips and markups.
Students will know that a discount is an amount by which the price of an item is decreased and is often represented as a percent of the original price.	Students can solve multi-step ratio and percent problems involving discounts.
Students will use the simple interest formula to solve interest problems.	Students can solve problems involving simple interest.
Students will understand what commission and fees are, and that they are normally calculated using percents.	Students can solve problems involving commission and fees.
Students will explore percent error using the percent of change methods.	Students can solve problems involving percent error.

Unit 2: Solve Percent Problems

MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 3: Operations with Integers

MS - Math 7

UNIT OVERVIEW

Add, subtract, multiply, and divide integers.

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

M07.A-N.1.1   M07.A-N.1.1.1   M07.A-N.1.1.2

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.1.7.E.1

BIG IDEAS

Big Ideas

- **Add Integers**
- **Subtract Integers**
- **Multiply Integers**
- **Divide Integers**
- **Apply Integer Operations**

ESSENTIAL QUESTIONS

Essential Questions

- How are operations with integers related to operations with whole numbers?

Unit 3: Operations with Integers

MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will know how to use algebra tiles to explore how to add integers.	Students can solve problems adding integers
Students will know how to use algebra tiles to explore how to subtract integers.	Students can solve problems subtracting integers.
Students will know how to use algebra tiles to explore how to multiply integers	Students can solve problems multiplying integers.
Students will know how to use algebra tiles to explore how to divide integers.	Students can solve problems dividing integers.
Students will know how to apply the order of operations to evaluate a numerical expression involving integers.	Students can solve problems by applying all operations to integers.

Unit 3: Operations with Integers
MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 4: Operations With Rational Numbers

MS - Math 7

Perform addition, subtraction, multiplication and division of rational numbers.

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

| M07.A-N.1.1 | M07.A-N.1.1.1 | M07.A-N.1.1.3 | M07.B-E.2.3 | M07.B-E.2.3.1 |

Pennsylvania Common Core - Grade 7 - Mathematics

| CC.2.1.7.E.1 | CC.2.2.7.B.3 |

BIG IDEAS

Big Ideas

- **Rational Numbers**
- **Add Rational Numbers**
- **Subtract Rational Numbers**
- **Multiply Rational Numbers**
- **Divide Rational Numbers**
- **Apply Rational Number Operations**
-

ESSENTIAL QUESTIONS

Essential Questions

- How are operations with rational numbers related to operations with integers?

Unit 4: Operations With Rational Numbers
MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will explore how to convert rational numbers to decimals and vice versa.	Students can identify terminating and repeating decimals and use long division to convert rational numbers to decimals.
Students will learn how to find the additive inverse of a rational number.	Students can add rational numbers in their different formats.
Students will learn how to subtract rational numbers.	Students can subtract rational numbers and use the additive inverse to represent subtraction expressions.
Students will understand that they can apply what they know about multiplying fractions, decimals, and integers to set of rational numbers.	Students can multiply rational numbers and use the order of operations to solve real-world problems.
Students will understand that they can apply what they know about dividing fractions, decimals, and integers to the set of rational numbers.	Students can divide rational numbers and use the multiplicative inverse to represent division expressions.
Students will understand how to apply the properties of operations to evaluate expressions involving rational numbers.	Students can apply their understanding of the four operations with rational numbers to evaluate mathematical expressions.

Unit 4: Operations With Rational Numbers

MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 5: Simplify Algebraic Expressions

MS - Math 7

UNIT OVERVIEW

Use properties of operations to simplify algebraic expressions.

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

M07.B-E.1.1.1   M07.B-E.1.1

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.2.7.B.1

BIG IDEAS

Big Ideas

- **Simplify Algebraic Expressions**
- **Add Linear Expressions**
- **Subtract Linear Expressions**
- **Factor Linear Expressions**
- **Combine Operations with Linear Expressions**

ESSENTIAL QUESTIONS

Essential Questions

- Why is it beneficial to rewrite expressions in different forms?

Unit 5: Simplify Algebraic Expressions
MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will know how to use algebra tiles to explore how to simplify algebraic expressions.	Students can simplify algebraic expressions by combining like terms and using the Distributive Property.
Students will know how to add linear expressions.	Students can add linear expressions and express the sum in simplest form.
Students will know that when two expressions are additive inverses, their sum is zero.	Students can subtract linear expressions and express the difference in simplest form.
Students will know what a monomial is and how to identify one.	Students can find the GCF of monomials and factor algebraic expressions.
Students will know how to simplify linear expressions by using the Distributive Property, combining like terms, and writing the answer in factored.	Students can combine operations to simplify linear expressions.

Unit 5: Simplify Algebraic Expressions

MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 6: Write and Solve Equations
MS - Math 7

UNIT OVERVIEW

Write and solve one-step and two-step equations.

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

M07.B-E.2.2   M07.B-E.2.2.1

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.2.7.B.3

BIG IDEAS

Big Ideas

- **Write and Solve One-Step Equations**
- **Solve Two-Step Equations: px + q = r**
- **Write and Solve Two-Step Equations: px + q = r**
- **Solve Two-Step Equations: p(x + q) = r**
- **Write and Solve Two-Step Equations: p(x + q) = r**
-

ESSENTIAL QUESTIONS

Essential Questions

- How can equations be used to solve everyday problems?

Unit 6: Write and Solve Equations
MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will explore how to model and solve one-step equations.	Students can write and solve one-step equations with rational numbers.
Students will explore how to model and solve two-step equations.	Students can solve two-step equations in the form of $px + q = r$.
Students will explore how to write two-step equations from word problems.	Students can write and solve two-step equations of the form $px + q = r$.
Students will explore how to model and solve two-step equations with parenthesis.	Students can solve two-step equations in the form of $p(x + q) = r$.
Students will explore how to write two-step equations from word problems with parenthesis.	Students can write and solve two-step equations of the form $p(x + q) = r$

Unit 6: Write and Solve Equations
MS - Math 7

EVIDENCE OF LEARNING & ASSESSMENT

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 7: Write and Solve Inequalities
MS - Math 7

UNIT OVERVIEW

Write and solve one-step inequalities and two-step inequalities.

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

M07.B-E.2.2.2   M07.B-E.2.2

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.2.7.B.3

BIG IDEAS

Big Ideas

- **Solve One-Step Addition and Subtraction Inequalities**
- **Write and Solve One- Step Addition and Subtraction Inequalities**
- **Solve One-Step Multiplication and Division Inequalities with Positive Coefficients**
- **Solve One-Step Multiplication and Division Inequalities with Negative Coefficients**
- **Write and Solve One-Step multiplication and Division Inequalities**
- **Write and Solve Two-Step Inequalities**

ESSENTIAL QUESTIONS

Essential Questions

- How are solutions to inequalities different from solutions to equations?

Unit 7: Write and Solve Inequalities

MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will know how inequalities behave when adding or subtracting the same number from each side.	Students can solve and graph one-step addition and subtraction inequalities.
Students will know how to write inequalities from a real world problem	Students can write and solve one-step addition and subtraction inequalities.
Students will know how multiplying and dividing each side of an inequality by the same positive number affects the inequality	Students can solve and graph one-step multiplication and division inequalities with positive coefficients.
Students will know how multiplying and dividing each side of an inequality by the same negative number affects the inequality.	Students can solve and graph one-step multiplication and division inequalities with negative coefficients.
Students will know how to write one-step multiplication inequalities from real-world problems and interpret the solution.	Students can write and solve one-step multiplication and division inequalities
Students will know how to solve two-step inequalities.	Students can write and solve two-step inequalities

Unit 7: Write and Solve Inequalities

MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 8: Geometric Figures
MS - Math 7

UNIT OVERVIEW

Draw, describe and solve problems involving geometric figures.

STANDARDS/EXPECTATIONS

> **Pennsylvania - Eligible Content - Grade 7 - Mathematics**

M07.C-G.1.1   M07.C-G.1.1.1   M07.C-G.1.1.2   M07.C-G.1.1.3   M07.C-G.1.1.4   M07.C-G.2.1

M07.C-G.2.1.1   M07.C-G.2.1.2

> **Pennsylvania Common Core - Grade 7 - Mathematics**

CC.2.3.7.A.2

BIG IDEAS

Big Ideas

- **Vertical and Adjacent Angles**
- **Complementary and Supplementary Angles**
- **Triangles**
- **Scale Drawings**
- **Three Dimensional Figures**
-

ESSENTIAL QUESTIONS

Essential Questions

- How does geometry help describe objects.

Unit 8: Geometric Figures

MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will understand how to classify angles by their measures	Students can identify vertical and adjacent angles and use what they know to find missing values.
Students will explore the properties of complementary and supplementary angle pairs.	Students can identify complementary and supplementary angles and use what they know to find missing values.
Students will understand the relationships between side lengths and angles measure in a triangle.	Students can draw different types of triangles given names and/or certain criteria about the triangle.
Students will understand how to use scale drawings and the scale to find actual length.	Students can solve problems involving scale drawings.
Students will understand the attributes of polyhedron and non-polyhedron.	Students can describe different three dimensional figures and determine cross-sections formed by three dimensional figures.

Unit 8: Geometric Figures

MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 9: Measure Figures

MS - Math 7

UNIT OVERVIEW

Solve real-world and mathematical problems involving area, volume, and surface area.

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

M07.C-G.2.2   M07.C-G.2.2.1   M07.C-G.2.2.2

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.3.7.A.1

BIG IDEAS

Big Ideas

- **Circumference of Circles**
- **Area of Circles**
- **Area of Composite Figures**
- **Volume**
- **Surface Area**
- **Volume and Surface Area of Composite Figures**

ESSENTIAL QUESTIONS

Essential Questions

- How can we measure objects to solve problems?

Unit 9: Measure Figures

MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will know the relationship between the radius and diameter of a circle.	Students can use radius and diameter to find circumference.
Students will know how to explore the formula for the area of a circle.	Students can find the area of circles.
Students will know how to decompose a composite figure into known shapes in order to find the area.	Students can find the area of composite figures.
Students will know the relationship between the area of the base and the volume of a prism.	Students can find the volume of prisms and pyramids.
Students will know the relationship between nets and surface area.	Students can find the surface area of prisms and pyramids
Students will know that the volume of a composite figure can be found by first decomposing it into known figures.	Students can find the volume and surface area of composite figures.

Unit 9: Measure Figures

MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 10: Probability

MS - Math 7

UNIT OVERVIEW

Understand Probability, find the probability of simple events and compound events, and design simulations.

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

| M07.D-S.3.1 | M07.D-S.3.1.1 | M07.D-S.3.2 | M07.D-S.3.2.1 | M07.D-S.3.2.2 | M07.D-S.3.2.3 |

Pennsylvania Common Core - Grade 7 - Mathematics

| CC.2.4.7.B.3 |

BIG IDEAS

Big Ideas

- **Find Likelihoods**
- **Relative Frequency of Simple Events**
- **Theoretical Probability of Simple Events**
- **Compare Probabilities of Simple Events**
- **Probability of Compound Events**
- **Simulate Chance Events**
-

ESSENTIAL QUESTIONS

Essential Questions

- How can probability be used to predict future events?

Unit 10: Probability

MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will explore how to describe the likelihood of events.	Students can solve problems that classify the likelihood of simple events.
Students will explore how running on experiment helps to classify the likelihood of an event.	Students can find the relative frequency of simple events and compare relative frequency to experimental probability.
Students will explore the relationships between long-run relative frequency and theoretical probability.	Students can solve problems involving theoretical probability of simple events and their complements.
Students will understand how to compare relative frequency to theoretical probability.	Students can solve problems that compare probabilities and relative frequencies of simple events.
Students will explore finding sample spaces of repeated simple events.	Students can solve problems involving the probability of compound events.
Students will explore simulating events.	Students can solve problems by simulating compound probability events.

Unit 10: Probability

MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 11: Sampling and Statistics
MS - Math 7

UNIT OVERVIEW

Analyze samples and interpret data

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

M07.D-S.1.1	M07.D-S.1.1.1	M07.D-S.1.1.2	M07.D-S.2.1	M07.D-S.2.1.1

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.4.7.B.1	CC.2.4.7.B.2

BIG IDEAS

Big Ideas

- **Biased and Unbiased Samples**
- **Make Predictions**
- **Generate Multiple Samples**
- **Compare Two Populations**
- **Assess Visual Overlap**
-
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ESSENTIAL QUESTIONS

Essential Questions

- How can you use a sample to gain information about a population?

Unit 11: Sampling and Statistics

MS - Math 7

Knowledge	Skills
Students will know . . . . . (Acquired Knowledge)	**Students can do . . . . . (Acquired Skill)**
Students will learn about populations and samples.	Students can identify samples and as biased or unbiased and determine whether inferences from the samples are valid.
Students will understand that they can make predictions about a population by using information from a survey, provided the survey used an unbiased sample.	Students can make predictions based on data gathered using a valid sampling method.
Students will explore how taking multiple samples can help them when making inferences about a population.	Students can use multiple samples to gauge the variation in their predictions.
Students will understand which measures of center and variability best represent asymmetric and symmetric distributions of data.	Students can make comparative inferences about two populations based on the data from random samples.
Students will learn how they can use a ratio to assess the degree of visual overlap between two samples in order to make an inference as to how likely the population means are similar or different.	Students can informally assess the degree of visual overlap between two distributions.

Unit 11: Sampling and Statistics
MS - Math 7

Name of Assessment	Type (formative, summative, project-based, diagnostic)	Description
Questioning and Observation during instruction	Formative	Teacher observes student work and uses prompting and question strategies to check student understanding.
Lesson Practice	Formative	At the conclusion of each lesson, students complete the lesson practice with immediate feedback to check for understanding.
Module Test	Summative	At the conclusion of each module, students will complete a module test that includes all topics.

Unit 12: Spaced Learning Over Time (SLOT)
MS - Math 7

Spaced Learning Over Time (SLOT) is a retention strategy that utilizes specific timeframes to help students retain concepts. This method helps reinforce memory and improve long-term retention by allowing time for the brain to consolidate information. By revisiting material over time, it leverages the spacing effect to combat the forgetting curve.

After a month of teaching, it should be utilzed weekly to revisit problematic concepts that were taught precisely 28-42 days prior for SLOT #1. Only focus on one concept at a time. Instruction should be teacher heavy in the beginning that gradually transfers to the students. It should not take up the entire class, only 15-30 minutes.

SLOT #2 can occur about 2 months after SLOT #1 and can be similar in nature or worked into other areas of class.

It can be beneficial to include SLOT questions on homeworks and/or assessments. Digital aids that can provide immediate feedback are also recommended.

STANDARDS/EXPECTATIONS

Pennsylvania - Eligible Content - Grade 7 - Mathematics

M07.A-N.1.1   M07.A-N.1.1.1   M07.A-N.1.1.2   M07.A-N.1.1.3   M07.A-R.1.1   M07.A-R.1.1.1

M07.A-R.1.1.2   M07.A-R.1.1.3   M07.A-R.1.1.4   M07.A-R.1.1.5   M07.A-R.1.1.6   M07.B-E.1.1

M07.B-E.1.1.1   M07.B-E.2.1   M07.B-E.2.1.1   M07.B-E.2.2   M07.B-E.2.2.1   M07.B-E.2.2.2

M07.B-E.2.3   M07.B-E.2.3.1   M07.C-G.1.1   M07.C-G.1.1.1   M07.C-G.1.1.2   M07.C-G.1.1.3

M07.C-G.1.1.4   M07.C-G.2.1   M07.C-G.2.1.1   M07.C-G.2.1.2   M07.C-G.2.2   M07.C-G.2.2.1

M07.C-G.2.2.2   M07.D-S.1.1   M07.D-S.1.1.1   M07.D-S.1.1.2   M07.D-S.2.1   M07.D-S.3.2

M07.D-S.3.1.1   M07.D-S.3.1   M07.D-S.2.1.1   M07.D-S.3.2.1   M07.D-S.3.2.3   M07.D-S.3.2.2

Pennsylvania Common Core - Grade 7 - Mathematics

CC.2.1.7.D.1   CC.2.1.7.E.1   CC.2.2.7.B.1   CC.2.2.7.B.3   CC.2.3.7.A.1   CC.2.3.7.A.2

CC.2.4.7.B.1   CC.2.4.7.B.2   CC.2.4.7.B.3

BIG IDEAS

Big Ideas

- **Unit Rate**
- **Constant of Proportionality**
- **Proportional Relationships**
- **Percent of Change**
- **Operations with Integers**
- **Rational Number Operations**
- **Probability**
- **Compound Probability**
- **Linear Equations**
- **Area of Circles**
- **Missing Angles in Diagrams**
- **Scale Factor**
- **Likelihood**
- **Biased and Unbiased Samples**
-
-

ESSENTIAL QUESTIONS

LEARNING TARGETS: KNOWLEDGE & SKILLS

EVIDENCE OF LEARNING & ASSESSMENT

Unit 13: Interleaved Practice Format (IPF)

MS - Math 7

*In*terleaved Practice Format (IPF) is a retention strategy that involves mixing different types of problems or skills within a single study session, rather than focusing on one topic at a time. This approach enhances retention by forcing the brain to continuously retrieve and apply different types of information, promoting deeper learning. It also helps learners differentiate between concepts, improving long-term understanding and adaptability.

*Choose 3 to 4 dissimilar problems and arrange them in an ABC(D)-ABC(D)-ABC(D) as opposed to AAABBBCCC.

*9-12 problems total, too many problems will defeat the purpose.

*The process required to answer a problem should be considered when identifying "dissimilar" problems.

*Consider the difficulty level of each problem (Basic, Moderate & Advanced). Do not group 3 advanced problems together on an IPF. Have a good mix.

*The concepts used should not have been taught closely together in the same unit. There should also be some time in between when they were taught and used in an IPF.

*The activity should progress from teacher heavy to student heavy but is flexible to your preferences. Sample, the first set of ABC questions are "I do." The second set is "we do" and the third/fourth set is "you do."

*IPF's should occur 2-3 times per month.

*Can be classwork or homework

*Should not look or feel like a test situation.

*Can be combined with other activities (SLOT, Worked out solutions, etc)

STANDARDS/EXPECTATIONS

BIG IDEAS

Big Ideas

- **Constant of Proportionality, Solve Two Step Equation, Simple Probability**
- **Unit Rates, Add integers, Missing angle measure in a triangle**
- **Proportional graphs, Subtract integers, Missing angles in Parallel Lines**
- **Percent Change, Multiply Integers, Add Rational Numbers**
- **Simple Interest, Divide Integers, Likelihood**
- **Compound Probability, Subtract Rational Numbers, Commission**
- **Percent Error, Multiply Rational Numbers, Adjacent angles**
- **Complementary Angles, Tax, Divide Rational Numbers**
- **Cross Sections, Tips, Distance**
- **Discounts, Word Problems into Equations, 3-d figures**
- **Area of Circle, Rates of change, Simplify expressions**
- **Solve one step equation, Supplementary Angles, Probability Predictions**
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ESSENTIAL QUESTIONS

LEARNING TARGETS: KNOWLEDGE & SKILLS

EVIDENCE OF LEARNING & ASSESSMENT

UNIT OVERVIEW

Spring Math Classwide interventions are structured, evidence-based programs designed to improve math skills for an entire class by integrating frequent assessments and targeted practice. The program uses data to identify student needs and adjusts instruction accordingly, allowing for personalized support within a group setting. The benefits include improved math fluency, enhanced problem-solving skills, and more efficient identification of students who need additional help, all while fostering a collaborative learning environment.

HAMS Spring Math:
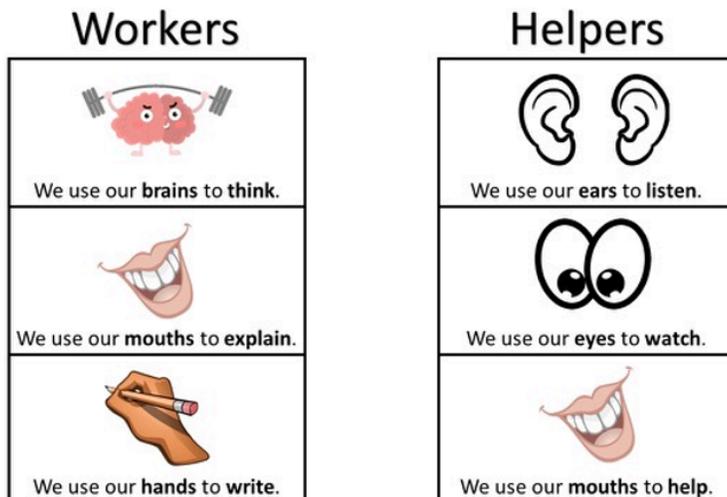## What it looks like, things we have learned to do, and not do

Overview:
-We have adopted spring math K-8 in our district
-This is our 3rd year of full implementation
-It was rough the first couple years, but we are really seeing improvement this year
-**PEER TUTORING IS THE KEY!!!!!!!**
-Include extra paper in the budget, there is a lot of copying involved but it's not difficult to fit in timewise.

In our building:
*We have a separate 20 minute period designated for spring math in which teachers of all content areas have their own class-this makes it very easy to group heterogeneously which is important. Once roles and routines are established, it goes very smoothly. In general, students enter the room and grab materials and sit with their partner (assigned by spring math).

Clearly define and show examples of what workers should do, and what helpers should do during peer tutoring.
This graphic is available in the support section of the spring math website and is very helpful in the early stages, and also to review if peer tutoring starts to decline later in the year.

Workers	Helpers
We use our **brains** to **think**.	We use our **ears** to **listen**.
We use our **mouths** to **explain**.	We use our **eyes** to **watch**.
We use our **hands** to **write**.	We use our **mouths** to **help**.

Some other helpful hints that can be included:

1. Do not degrade a peer of their work

2. Do not give answers

3. If stuck, give your partner some hints

4. Its ok to a give a number fact as a hint

The Daily Classwide Intervention:The spring math crew will train you how to do this:

The first 6 minutes is peer tutoring, **PEER TUTORING IS THE KEY!!!!!!!** The stronger student goes first as "the worker" and works through the problems literally verbalizing each and every step. The other is "the helper" who listens, watches and checks the answers. If the worker gets one wrong, the helper doesn't give the answer, just indicates that it's wrong and they should recheck their work. If needed, they can give prompts and hints. After 3 minutes, they switch roles and sometimes the stronger student as the helper may need to offer more hints or explanation. Students then recycle the worksheets and answer keys and get ready for the timed assessment- which is either 2 or 4 minutes (read the directions). After the timed assessment, they switch papers with their partners, use correcting pens and check answers. Then they hand them back, make corrections and mark their tracking sheets. Collect them, pull a random paper for the "score to beat" and you only need to enter the scores online at the end of the week-more than half the class needs to meet the goal to pass.

*Spring Math is not meant to be graded; however, most teachers offer rewards as motivation and have freedom on how to do so. Since, **PEER TUTORING IS THE KEY!!!!!!!**

It is recommend that this is part of the reward system. Here is a sample rewards system:
-Peer tutoring 1-10pts:
Teacher walks around during peer tutoring and then assigns a score at the end. It is helpful after the first 3 minutes to recognize what is good and what could be better.
-"Score to beat" = 5 pts
If the random paper pulled is higher than the previous day.
-Beat your best score or the goal = 1 pt/student
Students check their tracking sheet, if they beat their best score or the goal for that skill
(kids always want to throw the peer tutoring sheets in the trash like basketballs, some teachers work this into a rewards system as well in various ways-1 pt for a make or you can only shoot if the peer tutoring is 8 or higher, etc)
Pass the skill as a class = 20 pts

Rewards:
We have found gym/outdoor time very motivating. Many teachers take their kids to the gym or go outside during spring math when they pass a skill or earn a certain amount of points. It's more

motivating if the students pick the reward and a reasonable amount of points to earn for it. It is helpful to wait a couple weeks before assigning point values to rewards until you see what the average scores are.

Other reward ideas:

Teacher/admin must wear a tutu all day long

Pie a teacher/admin in the face

Duct tape teacher/admin to the wall

Party (students provide refreshments)

Outdoor activity

Extra credit in classes (as long as teachers agree to it)

Anything reasonable students come up with

You can offer a tiered reward system as well, and it's okay to adjust points if the students start to lose hope.

*For difficult topics-Sometimes we would swap spring math classes so a math teacher can explain the procedures to a different class. The math teachers also made videos or found youtube links to explain how to do the problems and shared it with everyone (this is still a work in progress).

Adjustments we have made through the years

Do **not** group homogeneously-You will have groups that finish in half of a year and groups that won't pass skill 3. This is not how spring math was designed, and we kind of learned this the hard way with 6th grade our first year.

*This year, we removed about 10 students from spring math classes and they work on basic math skills during this time with a designated teacher, typically multiplication facts. They were students that were flagged in the system for consistently getting 0's on their assessments. These kids were probably embarrassed of their skills so didn't try on purpose, hoping to cover up inadequacies. Spring Math encourages Individual Interventions for kids that fall behind, but can't really tell us how to do it in a middle school setting. We eventually got around to it for a handful of students and found every single time that they didn't know their multiplication facts-which is needed for a large portion of the skills. This is part of the reason we pulled those kids and work primarily on multiplication.

It also seemed that many classes were getting held back by these few students and we've seen a lot of progress in our current model. Not saying it's the best idea, but we found it to work well for us.

Some kind of organization system is helpful-many teachers have a hanging folder system with folders for Day 1 through 5, answer keys and tracking sheets. This way you can make all the copies needed for the week at once.

One of our teachers came up with a google form to help students track their progress online instead of using the paper sheet. It takes some savvy spreadsheet skills, but is doable.

STANDARDS/EXPECTATIONS

Unit 14: Spring Math

MS - Math 7

BIG IDEAS

Big Ideas

- **2 Digit Addition with and Without Regrouping**
- **2 Digit Subtraction with and Without Regrouping**
- **Multi-Digit Multiplication with and w/o Regrouping**
- **Multi-Digit Division With & Without Remainders**
- **Find the Least Common Denominator**
- **Simplify Fractions: A**
- **Simplify Fractions: B**
- **Simplify Fractions: C**
- **Add/Subtract Fractions with Unlike Denominators**
- **Mixed Fraction Operations**
- **Add and Subtract with Integers**
- **Quantity Comparison with Integers**
- **Algebraic Proportions**
- **Find Percent of a Whole Number**
- **Add, Subtract, Multiply and Divide Integers of Varied Sign**
- **Order of Operations**
- **Calculate Missing Value in Percent Problem**
- **Solve Equations with Percentages**
- **Inverse Operations Add/Subtract**
- **Convert Decimals to Fractions**
- **Complex Fractions**
- **Inverse Operations Multiply/Divide**
- **Convert Fractions to Decimals**
- **Solve two step equations**
- **Translate Verbal Expressions into Math Equations**
- **Solve two step equations with fractions**
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ESSENTIAL QUESTIONS

LEARNING TARGETS: KNOWLEDGE & SKILLS

EVIDENCE OF LEARNING & ASSESSMENT