Math Vertical Alignment

Grades 3-6
January 20, 2020

Agenda

- MATH STAAR DATA REVIEW
- VERTICAL ALIGNMENT
- PLANNING PROTOCOL STEPS

DATA REVIEW

Performance Level	2015-2016 3rd Grade	2016-2017 4th Grade	2017-2018 5th Grade	2018-2019 6th Grade	2019-2020 7th Grade
Approaches	70%	65%	77%	84%	Spring 2020
Meets	33%	33%	38%	51%	
Masters	14%	18%	15%	26%	

Performance Level	2016-2017 3rd Grade	2017-2018 4th Grade	2018-2019 5th Grade	2019-2020 6th Grade
Approaches	62%	64%	80%	Spring 2020
Meets	33%	31%	48%	
Masters	15%	13%	27%	

Performance Level	2017-2018 3rd Grade	2018-2019 4th Grade	2019-2020 5th Grade
Approaches	64%	64%	Spring 2020
Meets	30%	35%	
Masters	11%	18%	

Performance Level	2018-2019 3rd Grade	2019-2020 4th Grade
Approaches	65%	Spring 2020
Meets	31%	
Masters	11%	

MATH STAAR DATA

Discussion

- **What is this data telling you about the cohort of students?**

- **How do we provide instruction that promotes student growth?**

MATH STAAR DATA

Performance Level	2015-2016 3rd Grade	2016-2017 4th Grade	2017-2018 5th Grade	2018-2019 6th Grade	2019-2020 7th Grade
Approaches	70%	65%	77%	84%	Spring 2020
Meets	33%	33%	38%	51%	
Masters	14%	18%	15%	26%	

Performance Level	2016-2017 3rd Grade	2017-2018 4th Grade	2018-2019 5th Grade	2019-2020 6th Grade
Approaches	62%	64%	80%	Spring 2020
Meets	33%	31%	48%	
Masters	15%	13%	27%	

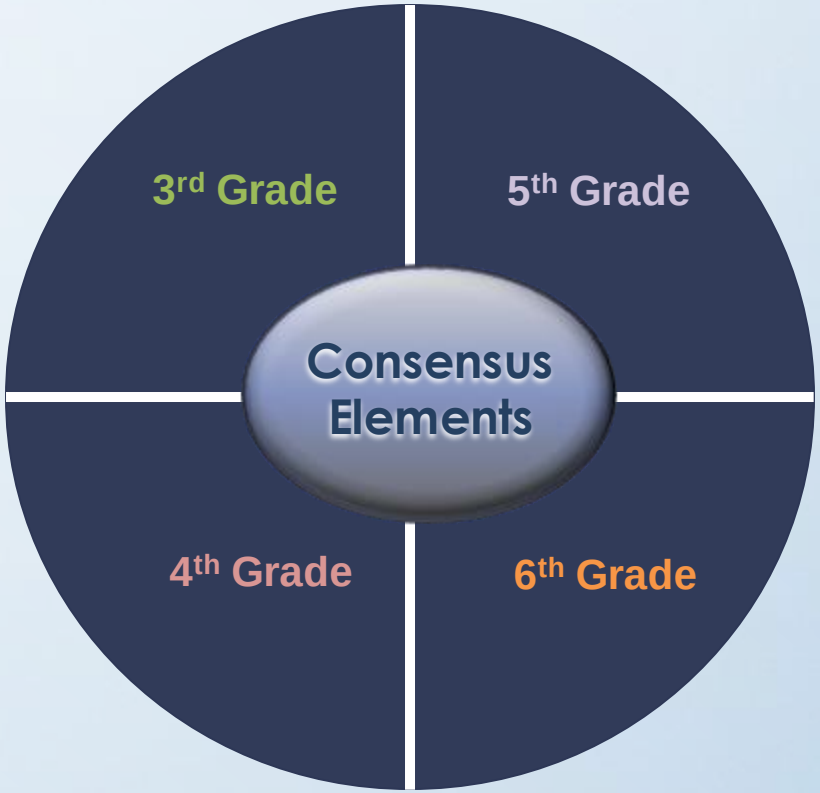
Performance Level	2017-2018 3rd Grade	2018-2019 4th Grade	2019-2020 5th Grade
Approaches	64%	64%	Spring 2020
Meets	30%	35%	
Masters	11%	18%	

Performance Level	2018-2019 3rd Grade	2019-2020 4th Grade
Approaches	65%	Spring 2020
Meets	31%	
Masters	11%	

Placemat Consensus

2 minutes to write individually
3 minutes to talk and reach consensus

5 minutes for each group to share out

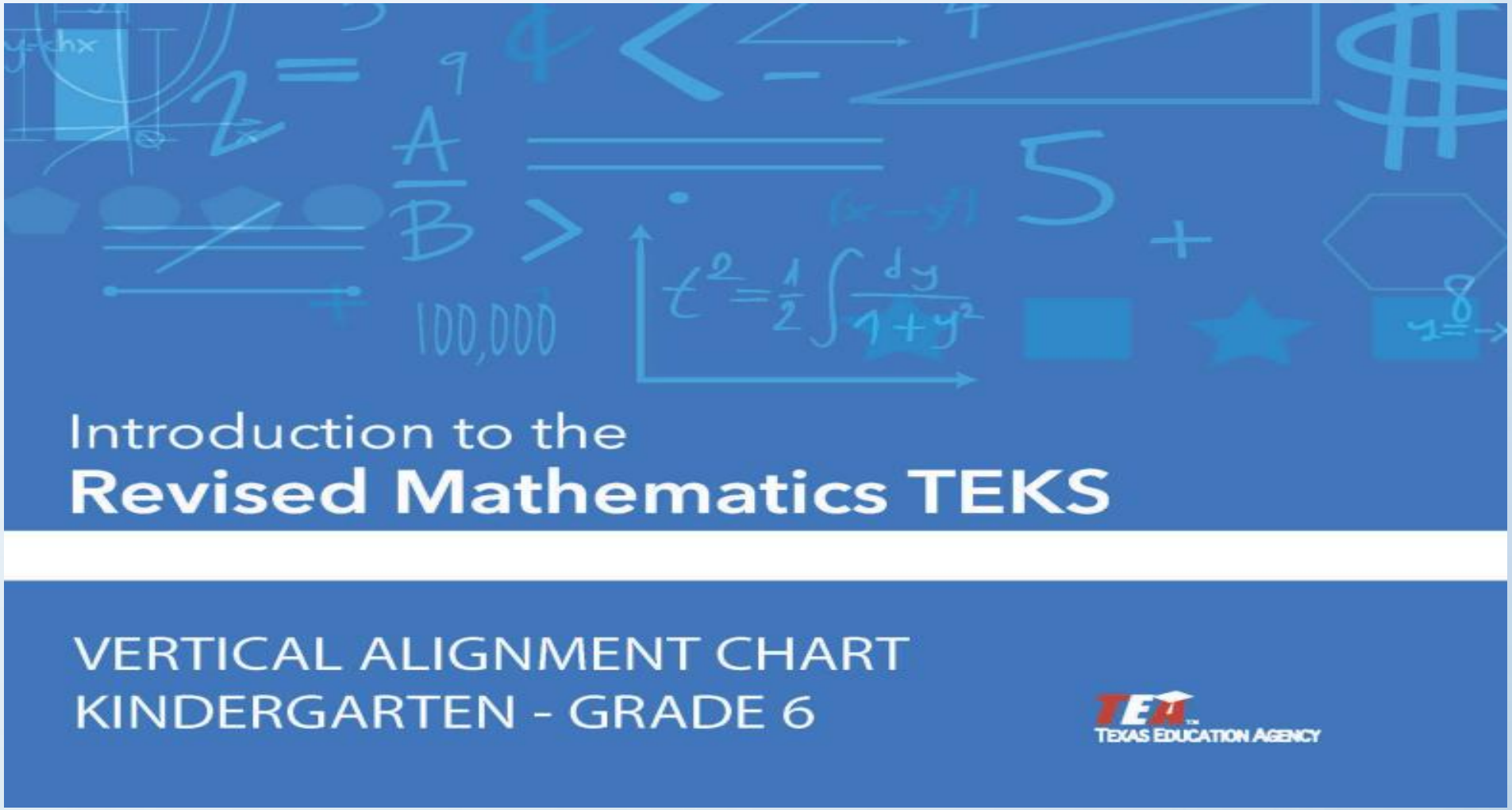


What is the importance/value of Vertical Alignment?

Vertical Alignment Goals

- Focus on learning and results
- Increase achievement for all students
- Improve communication between grade levels.

Vertical Alignment Chart Kindergarten – Grade 6



Comparing and Ordering Numbers

3rd Grade TEKS 3.2D

2019 – Q1

Which list shows the numbers in order from greatest to least value?

A 38,945 9,052 9,181

B 6,912 29,013 34,987

C 58,702 50,716 581

D 6,092 60,019 5,005

5th Grade TEKS 5.2B

2019 – Q14

Four students are traveling to a math contest. The table shows the weights of the four students' suitcases.

Weights of Suitcases

Student	Weight of Suitcase (pounds)
Juan	21.605
Tiana	24.8
Kimberly	21.48
Emanuel	24.75

In what position would Juan's suitcase be if the weights of the suitcases in pounds were ordered from greatest to least?

F First

G Second

H Third

J Fourth

2017 – Q30

30 The weights of four hippos at a zoo are listed.

- Hippo W: 3,894 lb
- Hippo X: 3,648 lb
- Hippo Y: 3,699 lb
- Hippo Z: 3,806 lb

If the hippos are listed in order from least weight to greatest weight, which hippo would come third in the list?

F Hippo W, because $3{,}806 < 3{,}648 < 3{,}894 < 3{,}699$

G Hippo X, because $3{,}806 < 3{,}894 < 3{,}648 < 3{,}699$

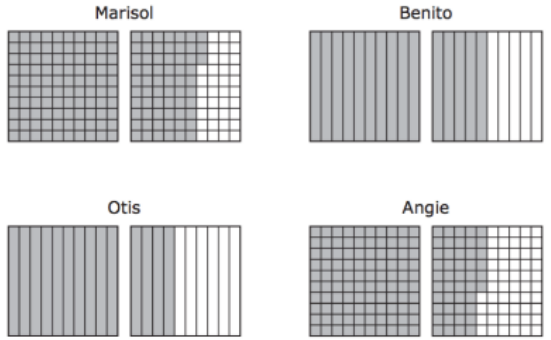
H Hippo Y, because $3{,}894 < 3{,}648 < 3{,}699 < 3{,}806$

J Hippo Z, because $3{,}648 < 3{,}699 < 3{,}806 < 3{,}894$

4th Grade TEKS 4.2C 4.2F

2016 – Q27

27 The distances in meters that four students jumped are modeled below.



Which list shows these distances in order from greatest to least?

A 1.46 m 1.5 m 1.4 m 1.63 m

B 1.63 m 1.46 m 1.5 m 1.4 m

C 1.4 m 1.46 m 1.5 m 1.63 m

D 1.63 m 1.5 m 1.46 m 1.4 m

6th Grade TEKS 6.2D

2019 – Q12

The weights of four puppies are shown in pounds.

$9.5 \quad 9\frac{3}{8} \quad 9.125 \quad 9\frac{3}{4}$

Which list shows these weights in order from greatest to least?

F $9\frac{3}{4}$ 9.5 $9\frac{3}{8}$ 9.125

G 9.5 $9\frac{3}{8}$ $9\frac{3}{4}$ 9.125

H 9.125 $9\frac{3}{8}$ 9.5 $9\frac{3}{4}$

J $9\frac{3}{4}$ $9\frac{3}{8}$ 9.5 9.125

Round Robin Discussion

- What did you notice about the problems?
- How are they the same? How are they different?

3.2 - ***Number and operations.*** *The student applies mathematical process standards to represent and compare whole numbers and understand relationships related to place value. The student is expected to*

3.2D - Compare and order whole numbers up to 100,000 and represent comparisons using the symbols >, <, or =.

Readiness Standard

4.2 - ***Number and operations.*** *The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to:*

4.2C - Compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols >, <, or =.

Supporting Standard

4.2F - Compare and order decimals using concrete and visual models to the hundredths.

Supporting Standard

5.2 - ***Number and operations.*** *The student applies mathematical process standards to represent, compare, and order positive rational numbers and understand relationships as related to place value. The student is expected to*

5.2B - Compare and order two decimals to thousandths and represent comparisons using the symbols >, <, or =.

Readiness Standard

6.2 - **Number and operations**. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to

6.2D - Order a set of rational numbers arising from mathematical and real-world contexts.

Readiness Standard

10 minute Break

15 minutes

Vertical Alignment Activity

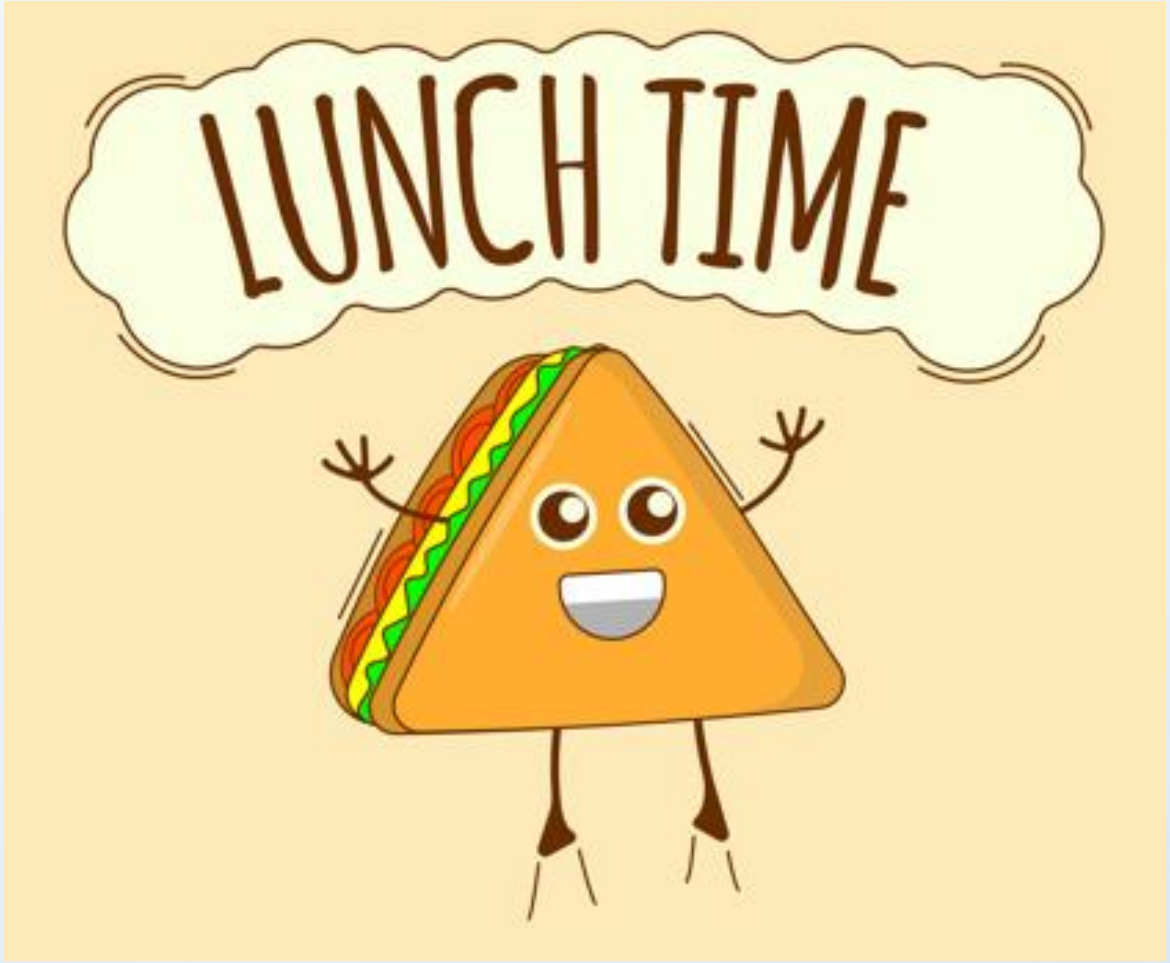
Each group will be given a skill statement to study and build a learning trajectory.

<u>As a group…</u>

1) **Discuss what students need to know and be able to do according to the SE at each grade level.**
2) **On chart paper:**
    1) **Write a group summary of the skill for each grade-level**
    2) **Delivery of instruction at each grade-level (best practices)**
    3) **Student misconceptions at each grade-level**

Reflection

- How does studying the TEKS across grade levels influence what I do in my classroom?



Have a good Lunch!

11:30 am – 1:00 pm

SFDR-CISD Planning Protocol

Planning Protocol Step 1

1	District Assessment & STAAR	**Understand from the District Assessment and STAAR:** • The TEKS that are tested, and whether they are readiness or supporting standards • How the TEKS are tested (level of rigor and specificity) • The big ideas/concepts tested

I will give you 10 seconds to <u>individually</u> write down a list of documents we use for this first step.

Now turn to a partner and compare lists and add as needed.

Planning Protocol Step 1

1	District Assessment & STAAR	**Understand from the District Assessment and STAAR:** • The TEKS that are tested, and whether they are readiness or supporting standards • How the TEKS are tested (level of rigor and specificity) • The big ideas/concepts tested

1.) Lead4Ward Snapshot

2.) IQ Released Tests

3.) Progress Monitoring

Any others??

https://lead4ward.com/resources/

lead4ward

TEKS Snapshot – Grade 4 Math

Mathematical Process Standards						
4.1 **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding.						
Tools to Know			**Ways to Show**			
4.1(A)	**4.1(B)**	**4.1(C)**	**4.1(D)**	**4.1(E)**	**4.1(F)**	**4.1(G)**
apply mathematics to problems arising in everyday life, society, and the workplace	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution	select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate	create and use representations to organize, record, and communicate mathematical ideas	analyze mathematical relationships to connect and communicate mathematical ideas	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

Knowledge and Skills Statements	
4.2	**Number and operations.** The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value.
4.3	**Number and operations.** The student applies mathematical process standards to represent and generate fractions to solve problems.
4.4	**Number and operations.** The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy.
4.5	**Algebraic reasoning.** The student applies mathematical process standards to develop concepts of expressions and equations.
4.6	**Geometry and measurement.** The student applies mathematical process standards to analyze geometric attributes in order to develop generalizations about their properties.
4.7	**Geometry and measurement.** The student applies mathematical process standards to solve problems involving angles less than or equal to 180 degrees.
4.8	**Geometry and measurement.** The student applies mathematical process standards to select appropriate customary and metric units, strategies, and tools to solve problems involving measurement.
4.9	**Data analysis.** The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data.
4.10	**Personal financial literacy.** The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security.

Rptg Cat	STAAR	Readiness Standards	Supporting Standards
1 Numerical Representations and Relationships	9	4.2(B) represent the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths using expanded notation and numerals 4.2(G) relate decimals to fractions that name tenths and hundredths 4.3(D) compare two fractions with different numerators and different denominators and represent the comparison using the symbols >, =, or <	4.2(A) interpret the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left 4.2(C) compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols >, <, or = 4.2(D) round whole numbers to a given place value through the hundred thousands place 4.2(E) represent decimals, including tenths and hundredths, using concrete and visual models and money 4.2(F) compare and order decimals using concrete and visual models to the hundredths 4.2(H) determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line 4.3(A) represent a fraction a/b as a sum of fractions $1/b$, where a and b are whole numbers and $b > 0$, including when $a > b$ 4.3(B) decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations 4.3(C) determine if two given fractions are equivalent using a variety of methods 4.3(G) represent fractions and decimals to the tenths or hundredths as distances from zero on a number line

Source: Texas Education Agency

v. 11.1.16

lead4ward

TEKS Snapshot – Grade 4 Math

Rptg Cat	STAAR	Readiness Standards	Supporting Standards
2 Computations and Algebraic Relationships	11	4.3(E) represent and solve addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations 4.4(A) add and subtract whole numbers and decimals to the hundredths place using the standard algorithm 4.4(H) solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders 4.5(A) represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity 4.5(B) represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence	4.3(F) evaluate the reasonableness of sums and differences of fractions using benchmark fractions 0, 1/4, 1/2, 3/4, and 1, referring to the same whole 4.4(B) determine products of a number and 10 or 100 using properties of operations and place value understandings 4.4(C) represent the product of 2 two-digit numbers using arrays, area models, or equations, including perfect squares through 15 by 15 4.4(D) use strategies and algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number and to multiply a two-digit number by a two-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties 4.4(E) represent the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations 4.4(F) use strategies and algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor 4.4(G) round to the nearest 10, 100, or 1,000 or use compatible numbers to estimate solutions involving whole numbers
3 Geometry and Measurement	10	4.5(D) solve problems related to perimeter and area of rectangles where dimensions are whole numbers 4.6(D) classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size 4.7(C) determine the approximate measures of angles in degrees to the nearest whole number using a protractor 4.8(C) solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate	4.6(A) identify points, lines, line segments, rays, angles, and perpendicular and parallel lines 4.6(B) identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure 4.6(C) apply knowledge of right angles to identify acute, right, and obtuse triangles 4.7(D) draw an angle with a given measure 4.7(E) determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures 4.8(A) identify relative sizes of measurement units within the customary and metric systems 4.8(B) convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table
		SEs Not Included in Assessed Curriculum	*4.5(C) use models to determine the formulas for the perimeter of a rectangle (l+w+l+w or 2l+2w), including the special form for perimeter of a square (4s) and the area of a rectangle (l x w)* *4.7(A) illustrate the measure of an angle as the part of a circle whose center is at the vertex of the angle that is "cut out" by the rays of the angle. Angle measures are limited to whole numbers* *4.7(B) illustrate degrees as the units used to measure an angle, where 1/360 of any circle is 1 degree and an angle that "cuts" n/360 out of any circle whose center is at the angle's vertex has a measure of n degrees. Angle measures are limited to whole numbers*
4 Data Analysis and Personal Financial Literacy	4	4.9(A) represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions	4.9(B) solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot 4.10(A) distinguish between fixed and variable expenses 4.10(B) calculate profit in a given situation 4.10(E) describe the basic purpose of financial institutions, including keeping money safe, borrowing money, and lending
		SEs Not Included in Assessed Curriculum	*4.10(C) compare the advantages and disadvantages of various savings options* *4.10(D) describe how to allocate weekly allowance among spending, saving, including for college; and sharing*
# Items	**34 (3 Griddable)**	**20-22 questions from Readiness Standards**	**12-14 questions from Supporting Standards**

Source: Texas Education Agency

v. 11.1.16

IQ Analysis | Investigating the Question	4.2(A)	RC 1

4.2(A) interpret the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left

2018 – Q13

13 A stadium sold 33,300 tickets to a concert. Which statement about this number is true?

A The value of the digit in the tens place is 10 times the value of the digit in the hundreds place.

B The value of the digit in the thousands place is $\frac{1}{10}$ the value of the digit in the ten thousands place.

C The value of the digit in the hundreds place is 10 times the value of the digit in the thousands place.

D The value of the digit in the ten thousands place is $\frac{1}{10}$ the value of the digit in the hundreds place.

***Correct Answer (B)**

Analysis of Assessed Standards

Cluster	Representation and Comparison of Whole Numbers and Decimals
Subcluster	Representation of Whole Numbers and Decimals
Content	Supporting
Process	
Stimulus	

Data Analysis

Item	State	Local	Error Analysis
A	10		▫ Guessing ▫ Careless Error ▫ Stopped Too Early ▫ Mixed Up Concepts
B*	44		
C	27		
D	18		

Learning from Mistakes Instructional Implications

4th Grade 4.5B

Progress Monitoring

1. The rule for a pattern is *subtract* 4, *add* 6. The first term is 10. Which shows the numbers in the pattern?

A 10, 6, 11, 7, 12, ...

B 10, 16, 12, 18, 14, ...

C 10, 6, 12, 8, 14, ...

D 4, 6, 10, 12, 16, ...

2. The input-output table shows the number of nickels, *n*, and the value in cents, *c*, of that number of nickels.

Input	*n*	3	5	6	8
Output	*c*	15			

If the output is $n \times 5$, what is the value in cents of 8 nickels?

F 8 cents

G 50 cents

H 40 cents

J 45 cents

3. The rule for a pattern is *add* 7. The first term in the pattern is 1. Which shows the numbers in the pattern?

A 1, 8, 16, 24, ...

B 1, 8, 9, 10, ...

C 1, 7, 13, 21, ...

D 1, 8, 15, 22, ...

2	TEKS Verification Document (TVD) ELPS	**Verify using the TEKS Verification Document (TVD):** • TEKS that require direct teaching (T) • TEKS that are ongoing (O) **Understand that Language Objectives (ELPS) correspond to Learning Targets:** • Must be implemented as an integral part of the lesson • Important for ALL learners

I will give you 10 seconds to <u>individually</u> write down a list of documents we use for this step.

Now turn to a partner and compare lists and add as needed.

2	Year-at-a-Glance (YAG) TEKS Verification Document (TVD) ELPS	**Determine from the Year-at-a-Glance (YAG):** • Units that will be taught and suggested time for teaching each unit • A logical sequence and timeframe for teaching the TEKS; establish a roadmap for teaching readiness and supporting standards **Verify using the TEKS Verification Document (TVD):** • TEKS that require direct teaching (T) • TEKS that are ongoing (O) **Understand that Language Objectives (ELPS) correspond to Learning Targets:** • Must be implemented as an integral part of the lesson • Important for ALL learners

Year at a Glance

Road Map

Frequency Distribution Chart

2019-2020
Year At A Glance

4th Grade

	1st Six Weeks	2nd Six Weeks	3rd Six Weeks
Week 1	Place Value TEKS 4.2A, 4.2B	Decimals to Fractions TEKS 4.2E, 4.2G, 4.3G	Input-Output Table TEKS 4.5B
Week 2	Place Value TEKS 4.2A, 4.2B	Multiplication TEKS 4.4B, 4.4C, 4.4D, 4.4G, 4.4H	Unit Fractions TEKS 4.3A, 4.3B
Week 3	Compare and Order TEKS 4.2C, 4.2F, 4.2H	Multiplication TEKS 4.4B, 4.4C, 4.4D, 4.4G, 4.4H	Equivalent Fractions TEKS 4.3C
Week 4	Estimation TEKS 4.2D	Division TEKS 4.4E, 4.4F, 4.4G	Compare Fractions TEKS 4.3D
Week 5	+/- Whole #s TEKS 4.4A, 4.4G, 4.5A	Division TEKS 4.4E, 4.4F, 4.4G	+/- Fractions TEKS 4.3E, 4.3F
Week 6	+/- Decimals TEKS 4.4A, 4.4G, 4.5A	Multi-Step TEKS 4.5A	Frequency Tables, Dot Plots TEKS 4.9A, 4.9B

	4th Six Weeks	5th Six Weeks	6th Six Weeks
Week 1	Stem and Leaf Plot TEKS 4.9A, 4.9B	Angles TEKS 4.7B, 4.7C	STAAR Review TEKS 4.10A, 4.10B, 4.10E
Week 2	Perimeter TEKS 4.5C, 4.5D	Angles TEKS 4.7D, 4.7E	STAAR Review
Week 3	Area TEKS 4.5C, 4.5D	Customary Units TEKS 4.8A, 4.8B	STAAR Review
Week 4	Geometry TEKS 4.6A, 4.6B	Metric Units TEKS 4.8A, 4.8B	May 12, 2020 Math STAAR Assessment
Week 5	Geometry TEKS 4.6A, 4.6B, 4.6D	Measurement TEKS 4.8C	PFL TEKS 4.10C
Week 6	Angles TEKS 4.6C, 4.7A, 4.7B	Time TEKS 4.8C	PFL TEKS 4.10D

*Note: Place Value TEKS will be ongoing with MRC

November 2019 — 3rd Six Weeks

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 **End of 2nd Six Weeks**	2
3	4 ***Beginning of 3rd Six Weeks*** **Week 1 Day 1** Multiplicative Data Relationships (4.5B)	5 **Week 1 Day 2:** Making Connections in Patterns (4.5B)	6 **Week 1 Day 3:** Multiplication & Division Relationships (4.5B)	7 **Week 1 Day 4:** Input & Output Tables (4.5A, 4.5B)	8 **Progress Monitoring #1:** (4.5A & 4.5B) **Week 2 Day 1:** Representing Fraction a/b as a sum of Fractions 1/b (4.3A, 4.3B)	9
10	11 **RTI DATA/Planning Day** **(New Math Training)**	12 **Week 2 Day 2:** Representing Fraction a/b as a sum of Fractions 1/b (4.3A, 4.3B)	13 **Progress Monitoring #2:** Unit Fractions	14 **Week 3 Day 1:** Equivalent Fractions (4.3C)	15 **Week 3 Day 2:** Equivalent Fractions (4.3C)	16
17	18 **Week 3 Day 3:** Equivalent Fractions on a Number Line (4.3C)	19 **Week 3 Day 4:** Equivalent Fractions (4.3C)	20 **Progress Monitoring #3:** Equivalent Fractions **Week 4 Day 1:** Comparing Fractions (4.3D)	21 **Week 4 Day 2:** Comparing Fractions using Benchmarks (4.3D)	22 **Week 4 Day 3:** Compare Fractions (4.3D)	23
24	25	26	27	28	29	30

Thanksgiving Break

December 2019

3rd Six Weeks

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 **Week 4 Day 4:** Compare Fractions (4.3D)	3 **Week 5 Day 1:** Adding Fractions (4.3E, 4.3F)	4 **Week 5 Day 2:** Adding Fractions (4.3E, 4.3F)	5 **Week 5 Day 3:** Subtracting Fractions (4.3E, 4.3F)	6 **Week 5 Day 4:** Subtracting Fractions (4.3E, 4.3F)	7
8	9 **Progress Monitoring #4:** Comparing Fractions/ Adding & Subtracting Fractions **Week 6 Day 1:** Data Analysis Frequency Tables (4.9A, 4.9B)	10 **Week 6 Day 2:** Data Analysis Frequency Tables (4.9A, 4.9B)	11 **Week 6 Day 3:** Dot Plots (4.9A, 4.9B)	12 **Week 6 Day 4:** Solving Problems with Dot Plots (4.9A, 4.9B)	13 **Progress Monitoring #5:** Data Analysis Frequency Tables & Dot Plots	14
15	16	17	18	19	20 **End of 3rd Six Weeks**	21
22	23	24 Winter	25	26	27	28
29	30	31 Break				

3rd Six Weeks Summative

Frequency Distribution: Grade 4 Mathematics (English and Spanish)

Questions per Standard by Year (STAAR)

Readiness Standards (N)						
SE	STAAR 2015	STAAR 2016	STAAR 2017	STAAR 2018	STAAR 2019	TOTAL 2015-19
4.2(B)	2	2	2	2	2	10
4.2(G)	3	3	2	2	2	12
4.3(D)	2	2	2	2	2	10
4.3(E)	2	2	2	1	2	9
4.4(A)	2	2	1	2	1	8
4.4(H)	3	3	2	1	2	11
4.5(A)	3	3	1	2	2	11
4.5(B)	2	2	1	2	1	8
4.5(D)	3	3	2	2	2	12
4.6(D)	2	2	2	1	1	8
4.7(C)	2	2	2	1	1	8
4.8(C)	2	2	1	2	2	9
4.9(A)	2	2	2	2	2	10
TOTAL	30	30	22	22	22	126
%	63%	63%	65%	65%	65%	64%

Supporting Standards (N)						
SE	STAAR 2015	STAAR 2016	STAAR 2017	STAAR 2018	STAAR 2019	TOTAL 2015-19
4.2(A)	0	0	0	1	0	1
4.2(C)	1	1	1	0	0	3
4.2(D)	0	0	1	0	0	1
4.2(E)	1	1	0	1	0	3
4.2(F)	1	1	0	0	0	2
4.2(H)	1	1	0	0	1	3
4.3(A)	1	1	0	0	1	3
4.3(B)	0	0	0	1	1	2
4.3(C)	0	0	0	0	0	0
4.3(F)	0	0	0	1	1	2
4.3(G)	0	0	1	0	0	1
4.4(B)	1	1	1	0	0	3
4.4(C)	0	0	0	1	1	2
4.4(D)	1	1	1	0	0	3
4.4(E)	0	0	0	0	0	0
4.4(F)	1	1	1	1	0	4
4.4(G)	1	1	1	0	1	4
4.6(A)	1	1	0	1	1	4
4.6(B)	1	1	1	1	0	4
4.6(C)	1	1	1	0	0	3
4.7(D)	0	0	0	0	1	1
4.7(E)	1	1	0	1	1	4
4.8(A)	1	1	1	0	0	3
4.8(B)	1	1	0	1	1	4
4.9(B)	1	1	1	1	0	4
4.10(A)	1	1	0	1	1	4
4.10(B)	1	1	1	0	0	3
4.10(E)	0	0	0	0	1	1
TOTAL	18	18	12	12	12	72
%	38%	38%	35%	35%	35%	36%

Process Standards (N)						
SE	STAAR 2015	STAAR 2016	STAAR 2017	STAAR 2018	STAAR 2019	TOTAL 2015-19
4.1(A)	32	32	*	*	*	64
4.1(B)	48	48	*	*	*	96
4.1(C)	9	9	*	*	*	18
4.1(D)	10	10	*	*	*	20
4.1(E)	14	14	*	*	*	28
4.1(F)	43	43	*	*	*	86
4.1(G)	5	5	*	*	*	10
TOTAL	161	161	*	*	*	322
avg/item	3.4	3.4	*	*	*	3.4

* embedded

48 questions 2015-2016

34 questions 2017-2019

http://tea.texas.gov/student.assessment/staar/exptested/

Source: Texas Education Agency

v. 6.26.19

3	Instructional Focus Document (IFD)	**Review using the Instructional Focus Document (IFD):** • • • • • **Identify the Learning Target for each concept** • Write a learning target in ***student friendly language*** to the required level of rigor and specificity • Identify/Create the Language Objective (ELPS) that correlates with each concept. **Identify Formative Assessment that is aligned to the learning target, e.g., journaling**

What are 5 components of the IFD?

I will give you 10 seconds to individually write down the 5 components.

3	Instructional Focus Document (IFD)	**Review using the Instructional Focus Document (IFD):** • **Academic Vocabulary for the unit** • **Rationale to identify big ideas and prerequisite knowledge** • **Key understandings and performance indicators** • **TEKS with specificity** • **Common misconceptions** **Identify the Learning Target for each concept** • Write a learning target in ***student friendly language*** to the required level of rigor and specificity • Identify/Create the Language Objective (ELPS) that correlates with each concept. **Identify Formative Assessment that is aligned to the learning target, e.g., journaling**

https://www.teksresourcesystem.net/

UNIT VOCABULARY

- **Associative property of multiplication** – if three or more factors are multiplied, they can be grouped in any order, and the product will remain the same; $a \times b \times c = (a \times b) \times c = a \times (b \times c)$
- **Commutative property of multiplication** – if the order of the factors are changed, the product will remain the same; $a \times b = c$; therefore, $b \times a = c$
- **Compatible numbers** – numbers that are slightly adjusted to create groups of numbers that are easy to compute mentally
- **Counting (natural) numbers** – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., *n*}
- **Distributive property of multiplication** – if multiplying a number by a sum of numbers, the product will be the same as multiplying the number by each addend and then adding the products together; $a \times (b + c) = (a \times b) + (a \times c)$
- **Equation** – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
- **Estimation** – reasoning to determine an approximate value
- **Factor** – a number multiplied by another number to find a product
- **Fluency** – efficient application of procedures with accuracy
- **Product** – the total when two or more factors are multiplied
- **Rounding** – a type of estimation with specific rules for determining the closest value
- **Strip diagram** – a linear model used to illustrate number relationships
- **Whole numbers** – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., *n*}

Related Vocabulary:

- About
- Approximately
- Area model
- Around
- Array
- Close
- Consecutive
- Estimate
- Halfway
- Little less
- Little more
- Magnitude
- Mental math
- Multiple
- Multiplication
- Number line
- Open number line
- Partial product
- Perfect square
- Place value
- Properties of operations
- Standard algorithm

Instructional Focus Document
Grade 4 Mathematics

TITLE : Unit 03: Multiplication of Whole Numbers **SUGGESTED DURATION :** 8 days

UNIT OVERVIEW

Introduction

This unit bundles student expectations that require solving one-, two-, or multi-step problem situations, as well as estimating and solving multiplication problems using a variety of strategies, including the standard algorithm. According to the Texas Education Agency, mathematical process standards including application, a problem-solving model, tools and techniques, communication, representations, relationships, and justifications should be integrated (when applicable) with content knowledge and skills so that students are prepared to use mathematics in everyday life, society, and the workplace.

Prior to this Unit

In Grade 3, students represented one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations. They represented and solved one- and two-step multiplication problems within 100 using arrays, strip diagrams, and equations. Students also determined the unknown whole number in a multiplication equation relating three whole numbers when the unknown is either a missing factor or product. Additionally, students represented multiplication facts by using a variety of approaches (e.g., repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line, and skip counting). They also recalled facts to multiply up to 10 by 10 with automaticity. Students used strategies (e.g., mental math, partial products, and the commutative, associative, and distributive properties) and algorithms, including the standard algorithm, to multiply a two-digit number by a one-digit number.

During this Unit

Students determine products of a number by 10 or 100 using properties of operations (commutative and distributive properties) and place value understandings. Multiple representations of products of 2 two-digit numbers are used (e.g., arrays, area models, or equations), including representing the products for perfect squares through 15 by 15. Grade 4 students use strategies (e.g., mental math, partial products, and the commutative, associative, and distributive properties) and algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number and to multiply a two-digit number by a two-digit number. These understandings build the students' capacity to fluently solve one-, two-, and multistep problems using combinations of addition, subtraction, and multiplication. They also represent problem situations using strip diagrams and equations with a letter standing for the unknown quantity. Students use rounding and compatible numbers to find estimates and justify reasonableness for solutions to problems involving these three operations.

After this Unit

In Units 05, 11, and 13, students will continue to apply multiplication skills as they use estimation along with knowledge of other operations to make connections across the curriculum. In Grade 5, students will extend their application of strategies for rounding numbers to decimals to the tenths or hundredths place. Students will also estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division. They will multiply, with fluency, a three-digit number by a two-digit number using the standard algorithm, in addition to representing and solving multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.

Instructional Focus Document
Grade 4 Mathematics

TITLE : Unit 03: Multiplication of Whole Numbers **SUGGESTED DURATION :** 8 days

UNIT UNDERSTANDINGS AND QUESTIONS	OVERARCHING CONCEPTS AND UNIT CONCEPTS	PERFORMANCE ASSESSMENT(S)

Recognizing and understanding operational relationships in a variety of problem situations leads to efficient, accurate, and flexible representations and solution strategies *(multiplication of whole numbers)*.
• How does the context of a problem situation affect the representation, operation(s), and/or solution strategy that could be used to solve the problem?
• How can representing a problem situation using …
◦ arrays
◦ area models
◦ an equation(s) with a letter standing for the unknown
◦ strip diagrams or other pictorial models
… aid in problem solving?
• What patterns and relationships can be found within and between the words, pictorial models, and equations used to represent a problem situation?
• How does understanding …
◦ relationships within and between operations
◦ properties of operations
◦ place value
◦ partial products
◦ multiples of 10 or 100
… aid in determining an efficient strategy or
	• Solution Strategies and Algorithms
	
	Algebraic Reasoning
	• Representations
	  • Concrete models
	  • Pictorial models
	  • Expressions
	  • Equations
	• Patterns and Relationships
	  • Multiples
	  • Perfect squares
	
	<u>Associated Mathematical Processes</u>
	• Application
	• Problem Solving Model
	• Tools and Techniques
	• Communication
	• Representations
	• Relationships
	• Justification
		b. Create a strip diagram and an equation to represent *n*, the number of bags Ann filled.
		
		c. Use rounding to find a reasonable estimate for the number of candy bags that Matt, Terry, and Ann filled altogether.
		
		d. Determine the actual number of candy bags that Matt, Terry, and Ann filled altogether.
		
		2. Three students in Mr. Krause's class bought some tokens for the carnival. Tara bought 14 tokens. Madi bought 10 times more tokens than Tara. Kevin purchased 100 times as many tokens as Tara.
		a. Determine the number of tokens that Tara and Madi bought altogether.
		
		b. Use place value and properties of operations to determine the number of tokens that Kevin purchased.
		
		c. Prior to leaving for the carnival, it was announced that Kevin won a school-wide contest. His prize was more tokens to the carnival. Kevin now has triple the number of tokens he originally purchased. Determine the total number of tokens Kevin has now.
		
		3. Dimitri had practiced his juggling act to perform at the

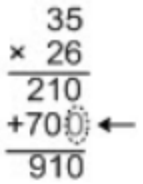
TITLE : Unit 03: Multiplication of Whole Numbers **SUGGESTED DURATION :** 8 days

TEKS# / SE#	TEKS	SPECIFICITY
		visually, or in written form within the given context. ◦ VIII.C. Communication and Representation – Presentation and representation of mathematical work • VIII.C.3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.
4.4	***Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:***	
4.4B	**Determine products of a number and 10 or 100 using properties of operations and place value understandings.** ***Supporting Standard***	Determine PRODUCTS OF A NUMBER AND 10 OR 100 USING PROPERTIES OF OPERATIONS AND PLACE VALUE UNDERSTANDINGS Including, but not limited to: • Whole numbers ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., *n*} ◦ Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., *n*} • Multiplication of whole numbers ◦ Product – the total when two or more factors are multiplied ◦ Factor – a number multiplied by another number to find a product • Knowledge of patterns in place value to solve multiplication involving multiples of 10 or 100 (e.g., 98 × 10; 98 × 100; 980 × 10; 980 × 100; 9,800 × 10; 9,800 × 100; etc.)

MISCONCEPTIONS / UNDERDEVELOPED CONCEPTS

Misconceptions:

- Some students may think that multiplication by 10, 100, or 1,000 means "adding the appropriate number of zeroes" rather than thinking of the product as 10, 100, or 1,000 times greater.
- Some students may think of the area model simply as another procedure for solving multiplication problems rather than as a geometric representation of the distributive property.
- Some students may think that area models are not related to the standard algorithm for multiplication rather than realizing that area models are a visual representation of multiplication and can be used to show the partial products produced through standard algorithms.
- Some students may think that the most efficient way to break up an area model into chunks (distributive property) is to break it up by place value rather than thinking about the numbers and then determining the most efficient way to solve from a variety of strategies.
- Some students may think that the standard algorithm for multiplication is always the most efficient way to solve a multiplication problem rather than thinking about the numbers and then determining the most efficient way to solve from a variety of strategies.
- When using standard algorithm for multiplying, some students may forget to place a zero in the second partial product to hold the number of tens by simply using the digits rather than considering the place value of the product.



Underdeveloped Concepts:

- Some students may lack fluency with basic multiplication facts.
- Some students may have a procedural understanding of the standard algorithms for multiplication while lacking conceptual understanding of the operation.

4	Instructional Resources	**Analyze available lessons and other resources:** • Choose or create activities/lessons that align to the big ideas/concepts that will be taught and tested (Planning Protocol Steps 1-3) • Plan a variety of short, frequent formative assessments • Use 5E model to design components of lesson • Determine instructional strategies and guiding questions that will promote critical thinking

I will give you 10 seconds to <u>individually</u> write a summary of the 4th step.

Now turn to a partner and discuss.

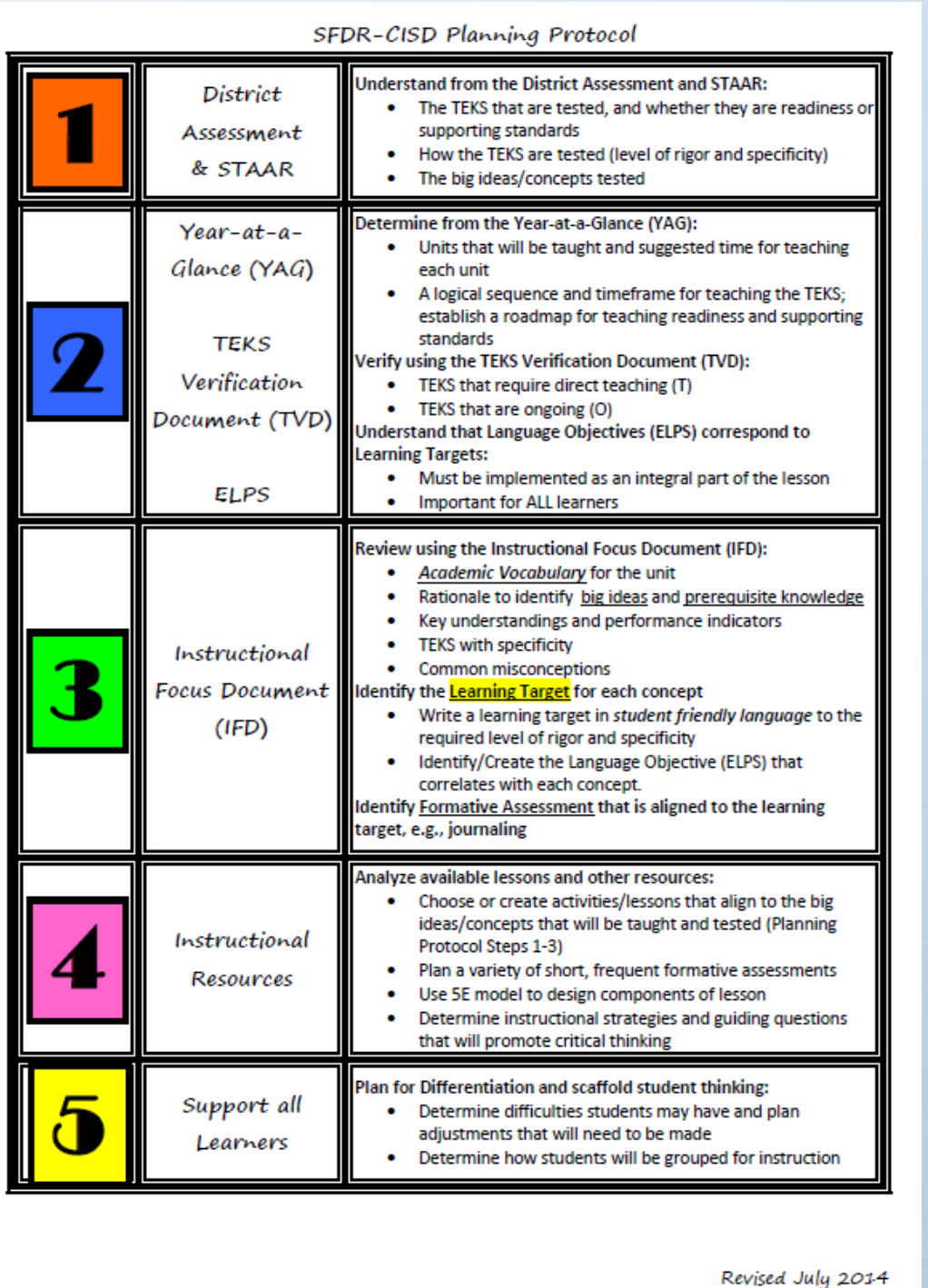
5	Support all Learners	**Plan for Differentiation and scaffold student thinking:** • Determine difficulties students may have and plan adjustments that will need to be made • Determine how students will be grouped for instruction

Who are we differentiating for?

How are we differentiating?

Planning Protocol Gallery Walk

- **Now that we understand each step of the Planning Protocol Document:**
  - **In groups of 5, you will move around the room adding some discussion questions that would guide conversations during Planning Protocol.**
  - **Be prepared to share out.**



SFDR-CISD Planning Protocol

1	District Assessment & STAAR	Understand from the District Assessment and STAAR: • The TEKS that are tested, and whether they are readiness or supporting standards • How the TEKS are tested (level of rigor and specificity) • The big ideas/concepts tested
2	Year-at-a-Glance (YAG) TEKS Verification Document (TVD) ELPS	Determine from the Year-at-a-Glance (YAG): • Units that will be taught and suggested time for teaching each unit • A logical sequence and timeframe for teaching the TEKS; establish a roadmap for teaching readiness and supporting standards Verify using the TEKS Verification Document (TVD): • TEKS that require direct teaching (T) • TEKS that are ongoing (O) Understand that Language Objectives (ELPS) correspond to Learning Targets: • Must be implemented as an integral part of the lesson • Important for ALL learners
3	Instructional Focus Document (IFD)	Review using the Instructional Focus Document (IFD): • *Academic Vocabulary* for the unit • Rationale to identify big ideas and prerequisite knowledge • Key understandings and performance indicators • TEKS with specificity • Common misconceptions Identify the Learning Target for each concept • Write a learning target in *student friendly language* to the required level of rigor and specificity • Identify/Create the Language Objective (ELPS) that correlates with each concept. Identify Formative Assessment that is aligned to the learning target, e.g., journaling
4	Instructional Resources	Analyze available lessons and other resources: • Choose or create activities/lessons that align to the big ideas/concepts that will be taught and tested (Planning Protocol Steps 1-3) • Plan a variety of short, frequent formative assessments • Use 5E model to design components of lesson • Determine instructional strategies and guiding questions that will promote critical thinking
5	Support all Learners	Plan for Differentiation and scaffold student thinking: • Determine difficulties students may have and plan adjustments that will need to be made • Determine how students will be grouped for instruction

Revised July 2014

10 minute Break

15 minutes

Horizontal Alignment Activity

Create a lesson for Week 4 implementing the 5 steps of Planning Protocol.

<u>As a team…</u>

- **Follow 5 Step Planning Protocol Document**
- **Focus on Week 4**
- **Use documents in packet**
- **Create a Lesson**
- **Be prepared to share out**

REFLECTION:

How will I incorporate the Planning Protocol Steps during planning?

Questions?

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