RLC
6-8
Mathematics Content
It’s My Pleasure to Introduction to You!

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Gwinnett County Public Schools
ELL/ESOL

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Cobb County Public Schools
Gifted
Not That...          But This...
“Equity is about more than just having internet access.”
Instructional Practices

1. Start each year by reading students’ IEPs. That practice will remain the same.
2. The dreaded ‘D’ word (Data)
3. (a) Addressing Essential Knowledge & Skills: Pacing suggestions & CC. (b) Independent PD, Research, & Reading.

Instructional Resources

Diagnostic, Formative & Summative

1. Virtual Diagnostics
2. Virtual Instruction
3. Formative & Summative Assessments: 3 Act Tasks
Addressing 6th Grade Content

**MGSE6.NS.2** Fluently divide multi-digit numbers using the standard algorithm.

**MGSE6.NS.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, including reasoning strategies such as using visual fraction models and equations to represent the problem.

“Why did you switch the order of the standards?” you might be asking!

Answer: If I ensure that students know $24 \div 12 = 2$, then they will have already ‘done’ $\frac{24}{12}$.

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**3 Act Task ‘Layered’ Implementation**

- Use as Formative Assessment
- Introduce Task at beginning of unit
- Have students make notes about what they notice and/or what they think they should do
- Ask if they’ve ever had to perform that type of problem IRL (home, store, etc.)
- As lesson progresses, have students go back & add new thoughts/ideas
The Apple Task

Act 1

Act 2

Act 3
Instructional Strategies

Which of the following quotients has the same value as $5.04 \div 7$?

- a. $5.04 \div 70$
- b. $50.4 \div 70$
- c. $504,000 \div 700$
- d. $504,000 \div 700,000$

Explain your reasoning in your groups.

Incorporating the Standards for Mathematical Practice

Visual Mathematics
Use of Manipulatives
7th Grade

“I’m not going back to teach 6th grade standards. I’m going to determine how the 6th grade standards align with the 7th grade content I will teach.”
Number talks

Which two are closer?

1/4  1/2  3/5

Estimate 4953 divided by 68

Notice and Wonders!

Which does not belong?

https://wodb.ca/numbers.html

http://www.mathtalks.net/nt-9-12.html
Concrete

For example, $3 + (-3) = 0$

$\begin{array}{c}
\begin{array}{c}
\text{Yellow tiles} \\
\text{Red tiles}
\end{array}
\end{array}$

$\begin{array}{c}
\begin{array}{c}
\frac{1}{4} \\
\frac{2}{4} \\
\frac{3}{4} \\
\frac{1}{4}
\end{array}
\end{array}$

$\frac{3}{4} + \frac{1}{4} = \frac{1}{2}$

Semi-concrete

$\begin{array}{c}
\begin{array}{c}
\text{Red tiles} \\
\text{Blue tiles}
\end{array}
\end{array}$

$\begin{array}{c}
\begin{array}{c}
\text{Add} \\
\text{Subtract}
\end{array}
\end{array}$

$+2 - 3 = 0$

Abstract

Situation #1:
Use the ledger to record the information and answer the questions.

Note: On August 12, your beginning balance is $0.00

1. On August 16, you receive a check from your Grandmother for $40 for your birthday.
2. On August 16, you receive a check from your Parents for $100 for your birthday.
3. On August 17, you purchase a pair of pants from Old Navy for $23.42.
4. On August 18, you find $5.19 in change during the day.
5. On August 19, you purchase socks from Wal-Mart for $12.76.

<table>
<thead>
<tr>
<th>DATE</th>
<th>TRANSACTION</th>
<th>PAYMENT (+)</th>
<th>DEPOSIT (+)</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/12</td>
<td>Beginning balance</td>
<td>+$0.00</td>
<td>-$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

GDOE: Debit and Credit
Begin by representing $+2$ using two positive color counters:

![Two positive counters](image)

Ask students: *Can we remove 5 positive yellow counters?* Students will discover that we currently cannot perform this subtraction (using our current representation, students can only remove 2 color-counters).

Ask students how we could add three more positive color counters without changing the problem’s value. Students will see that we can add 3 sets of zero pairs to the problem:

![Three zero pairs](image)

*In this model, the total value remains positive two despite the three zero pairs.*

Adding the zero pairs allows students to now remove positive 5 from the original positive 2.

![Adding zero pairs](image)

As a result, $2 - 5$ or $2 - (+5) = -3$.

Resource:

*Gwinnett County Public Schools. Math Online Communication Center. 2020*
Virtual manipulatives

https://toytheater.com/two-color-counter-numbers/
Balanced Numeracy Framework 6-12

<table>
<thead>
<tr>
<th>Activating Strategy (number talks)</th>
<th>Discussion board (school platform, padlet, Nearpod discussion tool)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Flipgrid</td>
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<tr>
<td></td>
<td>Zoom/google meets</td>
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<thead>
<tr>
<th>Mini-Lesson</th>
<th>Screencastify/Screencast-O-Matic videos</th>
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<td>zoom/google meets</td>
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<thead>
<tr>
<th>Differentiated Small Group Instruction</th>
<th>Google docs/Google slides</th>
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<tbody>
<tr>
<td></td>
<td>Discussion boards</td>
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<td></td>
<td>Zoom breakout rooms/google meets</td>
</tr>
<tr>
<td></td>
<td>H5P/EdPuzzles/Desmos/Geogebra/Quizizz/ Nearpod</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summary</th>
<th>Discussion board (school platform, padlet, Nearpod discussion tool)</th>
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<td></td>
<td>Zoom/google meets</td>
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</table>
8th Grade

"Teaching with intentionality is just good teaching."
Building Relationships

So much content, so little time!

Intentional Instruction

Effective Assessments

Teaching 8th grade concepts
Effective Assessments

| Assessment Focuses | Diagnostic                              | Formative                                               | Summative                                                         |
|--------------------|-----------------------------------------|---------------------------------------------------------|                                                                  |
|                    | What must students understand?          | How often am I checking?                                | What are the weak strands?                                        |
|                    | What have they missed last year?        | Do I grade all of it?                                   | How can this improve teaching practices as a teacher? PLC?       |
|                    | What will the test tell me?             | What does this say about where the student is?          |                                                                  |

How will I **use** the assessment? & How will this guide my instruction?
Intentional Instruction

What to teach?
- Driven by diagnostic and summative
- Informed through your formative:
  - Standards (Not in isolation)
  - ALDs

How to teach?
- Balanced Numeracy
- Flipped Classroom
- 3 ACT Tasks
- F.A.L. - Formative assessment lessons
- Build on prior knowledge
- Find ways to engage!
- Teach to the right and add scaffolds

How to teach? Pt. 2
- Teach the whole child
- Differentiate by giving choice
- Discussion board, Desmos, screen sharing, FlipGrid, virtual manipulatives, etc.
- Start concrete then, representational, then abstract with Prof. work

BE INTENTIONAL!
## Combine Learning Targets in Assignments

<table>
<thead>
<tr>
<th>Understand and apply the Pythagorean Theorem.</th>
<th>I can describe a proof of the Pythagorean Theorem and its converse.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.G7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</td>
<td></td>
</tr>
</tbody>
</table>
Concrete - Representational - Abstract


https://www.geogebra.org/

https://teacher.desmos.com/
Teach to the right and add scaffolds

What questions could we add to guide the student?

Could we give this assignment with no scaffolds?

Three right triangles surround a shaded triangle; together they form a rectangle measuring 12 units by 14 units. The figure below shows some of the dimensions but is not drawn to scale.

Is the shaded triangle a right triangle? Provide a proof for your answer.
In triangle $ABC$ below, $\angle B$ is a right angle and $|AB| = |BC|$:

Draw a line segment joining one of the vertices of $\triangle ABC$ to the opposite side so that it divides $\triangle ABC$ into two triangles which are both similar to $\triangle ABC$. Explain, using rigid motions and dilations, why the triangles are similar.
Build Relationships

- Schedule conferences with students
- Schedule conferences with small groups
- Keep track of the progress you make

Effective Feedback
Learning Style Inventory
Content Connections

Be consistent.
Be intentional.
Have fun!
6th Grade
GRADE LEVEL OVERVIEW

Sample Mathematics Learning Plan

Big Idea/Topic
Complete understanding of division of fractions and extend the notion of number to the system of rational numbers, which includes negative numbers.

Standard Alignment
Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

- MGSE6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, including reasoning strategies such as using visual fraction models and equations to represent the problem.
- MGSE6.NS.2 Compute fluently with multi-digit numbers and find common factors and multiples.
  - MGSE6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm.
  - MGSE6.NS.4 Find the greatest common factor of 2 whole numbers less than or equal to 120 and the common factors of two whole numbers less than or equal to 120.
    - Find the greatest common factor of 2 whole numbers and use the distributive property to express a sum of two whole numbers 1-120 as a common factor as a multiple of a sum of two whole numbers with no common factors. (GCF: Example: 36 + 8 = 4(9 + 2))
    - Apply the least common multiple of two whole numbers less than or equal to 12 to solve real-world problems.

Diagnostic Assessment
Estimating Solutions Assessment Probe
This probe can be implemented asynchronously or offline. Each student will need access to their own copy of the probe. To obtain valid diagnostic data, inform students calculators should not be used during the assessment. Instruct students to answer each question to the best of their knowledge and provide explanations even if they are unable to arrive at a solution for the question.

<table>
<thead>
<tr>
<th>Anticipated Thinking</th>
<th>Students and Their Thinking</th>
<th>Big Idea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place Value Understanding</td>
<td>Uses understanding of powers of 10 to estimate solutions (i.e.: 0.1 = 1/10, 1.8 = 1/10 = digit shifts to the right)</td>
<td>5th grade: Understand place value</td>
</tr>
<tr>
<td>Known Facts to Determine Unknown Solutions</td>
<td>Uses known facts to estimate unknown solutions (i.e.: 49 ÷ 7 = 7, so 50 ÷ 7 = 7. Therefore, 500 ÷ 7 = 70)</td>
<td>3rd grade: Develop an understanding of multiplication and division and strategies for multiplication and division within 100</td>
</tr>
<tr>
<td>Overgeneralization</td>
<td>Associates decreased value of solution with division</td>
<td>3rd grade: Develop an understanding of multiplication and division and strategies for multiplication and division within 100</td>
</tr>
<tr>
<td>Rounding</td>
<td>Rounds to the nearest hundred and/or tens before applying operations</td>
<td>4th grade: Develop an understanding and fluency with multi-digit multiplication and division of dividing to find quotients involving multi-digit dividends, generalize place value understanding to multi-digit whole numbers</td>
</tr>
<tr>
<td>Only Whole Numbers</td>
<td>Applies operations and records solutions with only whole number quantities considered.</td>
<td>4th grade: Develop an understanding and fluency with multi-digit multiplication and division of dividing to find quotients involving multi-digit dividends, generalize place value understanding to multi-digit whole numbers</td>
</tr>
<tr>
<td>Algorithm Over Reasoning</td>
<td>Applied an algorithm rather than using reasoning to determine an estimate</td>
<td>6th grade: Complete understanding of division of fractions and extend the notion of number to the system of rational numbers, which includes negative numbers</td>
</tr>
</tbody>
</table>
Synchronous - conducted live at the same time

Asynchronous - learning at a different time and location

unplugged/Offline - not reliant upon the use of the internet
Students' strengths and needs in these areas of cognitive functioning are integral to learning mathematics (Brodesky et al., 2002) and provide an additional lens to help teachers select appropriate supports for specific types of learner needs.
## Mathematics Resources

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>Coordinate Algebra, Geometry</td>
</tr>
<tr>
<td>1st Grade</td>
<td>Algebra I</td>
</tr>
<tr>
<td>2nd Grade</td>
<td>Analytic Geometry</td>
</tr>
<tr>
<td>3rd Grade</td>
<td>Algebra II - Advanced Algebra</td>
</tr>
<tr>
<td>4th Grade</td>
<td>Precalculus</td>
</tr>
<tr>
<td>5th Grade</td>
<td>All Other HS Courses</td>
</tr>
<tr>
<td>6th Grade</td>
<td>Calculus-Based HS Courses</td>
</tr>
<tr>
<td>7th Grade</td>
<td></td>
</tr>
<tr>
<td>8th Grade</td>
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</tbody>
</table>

Additional Teacher Resources

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