

Teacher Resources for *How Grand is Your Total?*

Introduction

This document contains links or references to all of the materials for the ***How Grand is Your Total?*** unit, organized by lesson number.

You also have access to a Dropbox folder full of the puzzle images and handouts, which makes it easier to share just the puzzles with students.

<https://www.dropbox.com/sh/q07gc6sjdeadho0/AAD0g7xwv6wqWDO2jND20Ro0a?dl=0>

The only resource not public or provided is EMPower's *Everyday Number Sense: Mental Math and Visual Models*. Learn more about the EMPower series and find a link for ordering the book here:

<https://www.terc.edu/empower>.

[Open Middle](#) is a source of math problems that demand deeper thinking to solve than their simple frames appear at first glance to require. These puzzles help students of all levels have rigorous math experiences, and provide high expectations for deep reasoning connected to big ideas of mathematics.

Both on the Open Middle website and in the lessons, answers are provided. However, in order to understand student thinking, **it's important that you try the problems yourself.**

MATERIALS BY LESSON

LESSON 1 Properties of Numbers

See Dropbox folder for *Properties of Numbers* handout for students.

LESSON 2 Addition

Sums to 100: <https://www.openmiddle.com/sums-to-100/>

Option for student access: <https://www.geogebra.org/m/zq8RFfJX> (requires student internet access)

Optional manipulative: <https://www.openmiddle.com/wp-content/uploads/2019/11/Number-Tiles-0-to-9.pdf>

Optional Homework:

- Domino Window: <https://www.openmiddle.com/domino-window/>
- Create an Equation: <https://www.openmiddle.com/create-an-equation/>

LESSON 3 Addition, continued

Close to 1000: <https://www.openmiddle.com/close-to-1000/>

Optional Homework:

- Window Sum: <https://www.openmiddle.com/window-sum/>
- Sum to 1,000 – Two Addends: <https://www.openmiddle.com/sum-to-1000-two-addends/>

LESSON 4 Equality

Make It Equal: <https://www.openmiddle.com/equivalent-statements/>

Solve Me Mobiles: <https://solve.me.edc.org/Mobiles.html> (can print screen to access without internet)

Optional Homework:

- Solve Me Mobile puzzles. Create a free account. <https://solve.me.org/Mobiles.html>
- Equality: <https://www.openmiddle.com/equality-2/>
- EMPOWER's *Everyday Number Sense: Mental Math and Visual Models* student book (<https://www.terc.edu/empower/>):
 - *Make it True* (p. 26 and p. 72)
 - *Check Both Sides of the Equal Sign* (pp. 27-28 and pp. 73-74)
 - *Practice Check Both Sides of the Equal Sign* (addition p. 89 and subtraction p. 90)
- Subtraction with Regrouping 2: <https://www.openmiddle.com/subtraction-with-regrouping-2/>

LESSON 5 Subtraction

Subtraction to Get the Smallest Difference: <https://www.openmiddle.com/subtraction-to-get-the-smallest-difference/>

Optional Homework:

- Adding and Subtracting within 10: <https://www.openmiddle.com/adding-and-subtracting-within-10/>
- Add Some, Subtract Some: <https://www.openmiddle.com/add-some-subtract-some/>
- Adding and Subtracting Two-Digit Whole Numbers: <https://www.openmiddle.com/adding-and-subtracting-two-digit-whole-numbers/>

LESSON 6 Multiplication

Multiplying a Two-Digit Number by a Single-Digit Number: <https://www.openmiddle.com/multiplying-a-two-digit-number-by-a-single-digit-number/>

Optional Homework: A different kind of flash card.

- Cards: <https://gfletchy.com/wp-content/uploads/2015/02/Multiplication-Subitizing-Cards-Dice.pdf>
- Read about the cards here: <https://gfletchy.com/2015/08/17/not-your-moms-flashcards-conceptual-understanding-of-multiplication/>

LESSON 7 Multiplication, continued

Multiplying Two-Digit Numbers: <https://www.openmiddle.com/multiplying-two-digit-numbers-elementary/>

Options for student access:

- Drag and drop calculator, includes whiteboard space. Directions as close to 1000 as possible: <https://www.geogebra.org/m/mdhn4gzc> (requires student internet access)
- Drag and drop calculator. Directions as close to (a) 1,000; (b) 2,500; (c) 5,000; (d) 7,500 as possible: <https://www.geogebra.org/m/ggpnh9br> (requires student internet access)

Optional Homework:

- Multiplication Decisions: <https://www.openmiddle.com/multiplication-decisions/>
- Distributive Property with Four: <https://www.openmiddle.com/distributive-property-with-four/>

- EMPower's *Everyday Number Sense: Mental Math and Visual Models* student book Four Ways to Write Division (pp. 209-210) <https://www.terc.edu/empower>

LESSON 8 Division

Partial Quotients – Teacher Prep: https://www.dropbox.com/scl/fi/s02a90ibe14fsas2wylau/Partial_Quotient_Show.ppsx?dl=0&rlkey=eb9x5z76vcboh3sp140u8myn

Desmos Classroom Activity: Greater, Less Than, or One (no-student-internet version: see the printable *Greater, Less Than, or One* worksheet and card sort document in the Dropbox folder)

Teacher Prep: <https://learn.desmos.com/activities-get-started>

Activity: <https://teacher.desmos.com/activitybuilder/custom/60511b760eadba311f6b32d7>

Whole Number Division: <https://www.openmiddle.com/whole-number-division/>

Division Fill in the Blanks (No Remainder): <https://www.openmiddle.com/division-fill-in-the-blanks-no-remainder/>

LESSON 9 Adding Fractions

Adding Fractions to Make a Whole Number: <https://www.openmiddle.com/adding-fractions-to-make-a-whole-number/>

Optional Homework:

- Adding Fractions 4: <https://www.openmiddle.com/adding-fractions-4/>
- Adding Fractions 3: <https://www.openmiddle.com/sum-of-fractions/>
- Adding Fractions: <https://www.openmiddle.com/adding-fractions/>

LESSON 10 Multiplying Fractions

Multiplying Fractions to Make a Whole Number: <https://www.openmiddle.com/multiplying-fractions-to-make-a-whole-number/>

LESSON 11 How Grand is Your Total?

How Grand is Your Total? <https://www.saravanderwerf.com/how-grand-is-your-total-a-25-year-old-open-middle-problem/>