

Grades 2 to 5: Nemeth Code Symbols for Fractions and Spatial Problems, Instructional Tools, Materials, and Technology

Lesson 5: Instructional Tools and Materials



University of South Carolina Upstate, Summer 2020

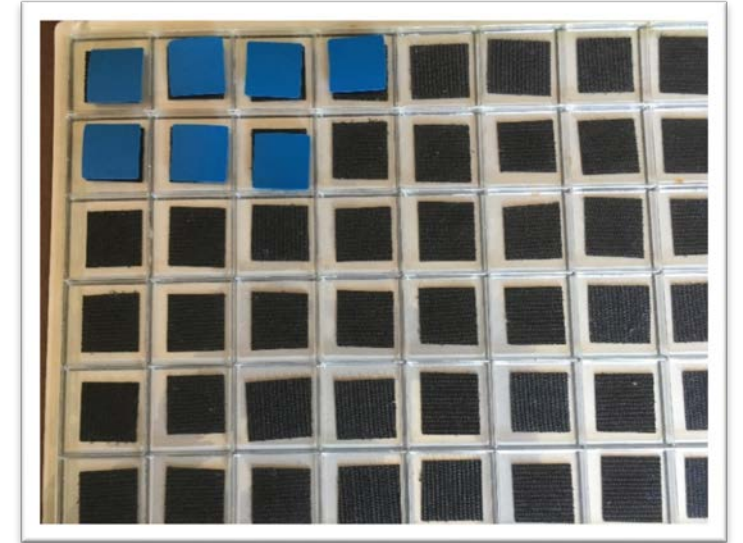
Lesson 5 Objectives

Participants will be able to:

- Identify materials that can be used when teaching math computation and fraction concepts to students in grades 2-5.
- Recognize ways they can support math instruction for students in grades 2-5 who are learning math computation and fraction concepts.

Teaching Odd and Even Numbers

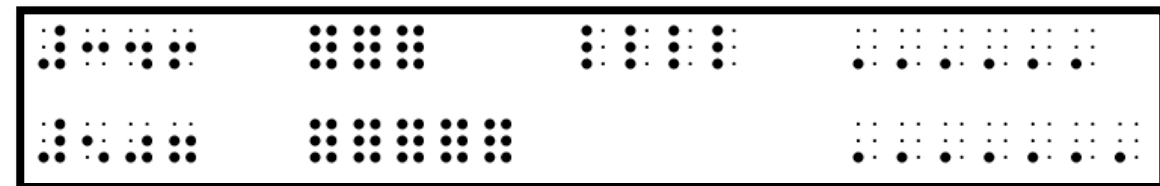
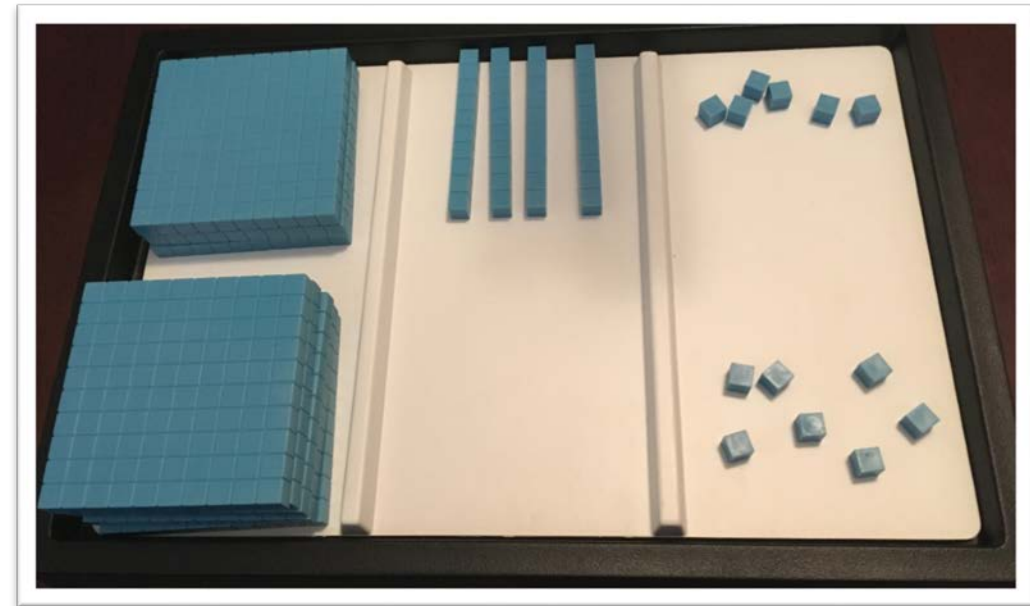
- Second grade skill
- Even – pairs with none left over
- Odd – pairs with one left over
- In many classrooms, students write equations to express **even numbers** as the sum of 2 equal addends (e.g., $4 + 4 = 8$).
- Avoid graph paper and stickers to save costs.
- Use:
 - APH 100s Board and Manipulatives
 - APH Score Card



Comparing or Adding 3-digit Numbers

Compare 346 and 507

- Second grade skill
- Sorting tray with base ten blocks (one number at the top, second at the bottom of the tray)
- Braillewriter:
 - Hundred/flat = full cell
 - Ten/long/rod = dots 1-2-3
 - One/unit = dot 3

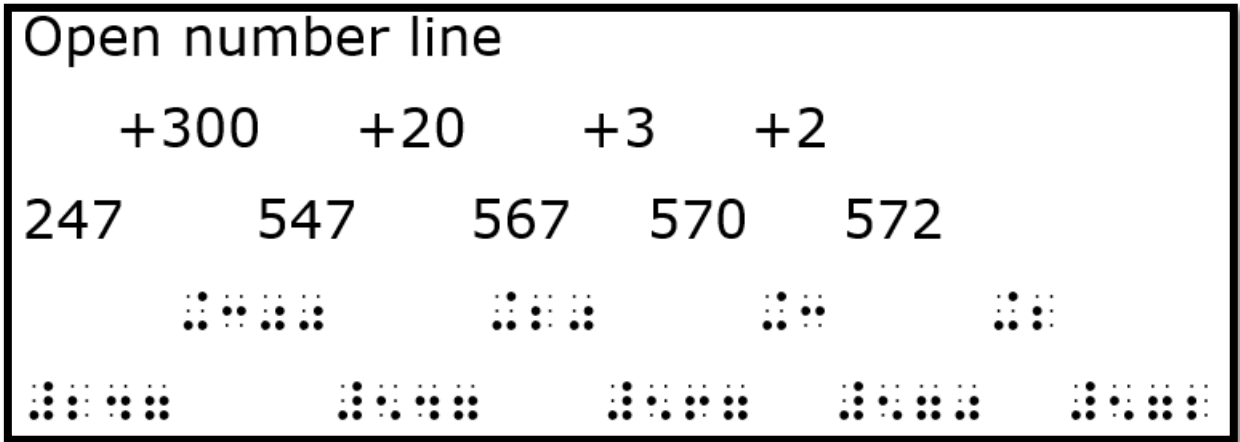
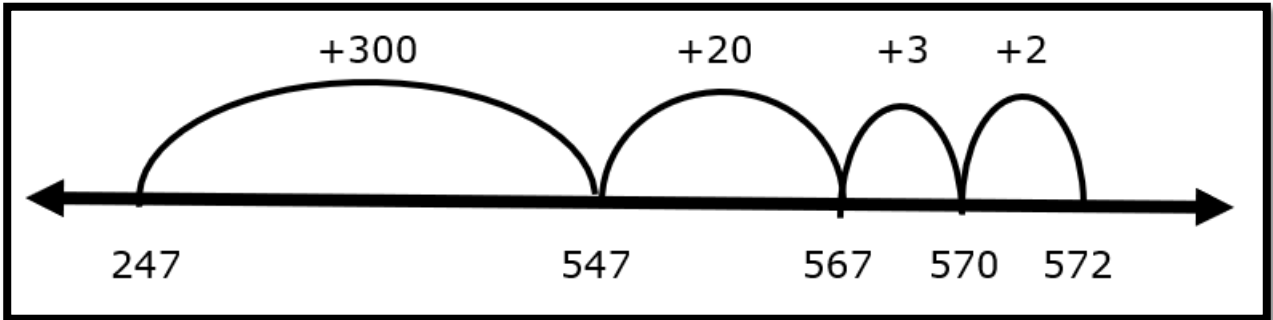


Adding or Subtracting 3-digit Numbers

- Second grade skill

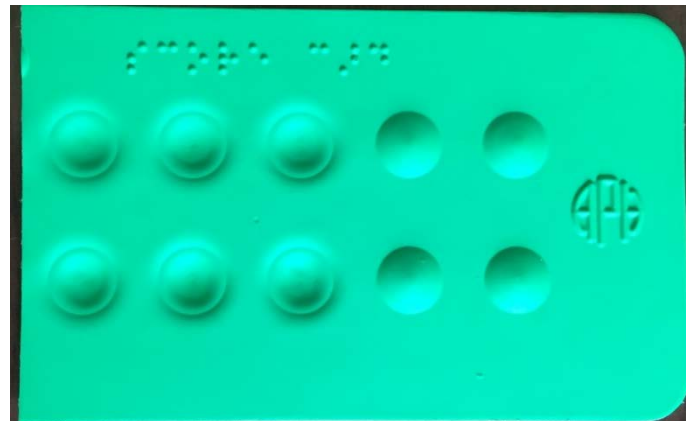
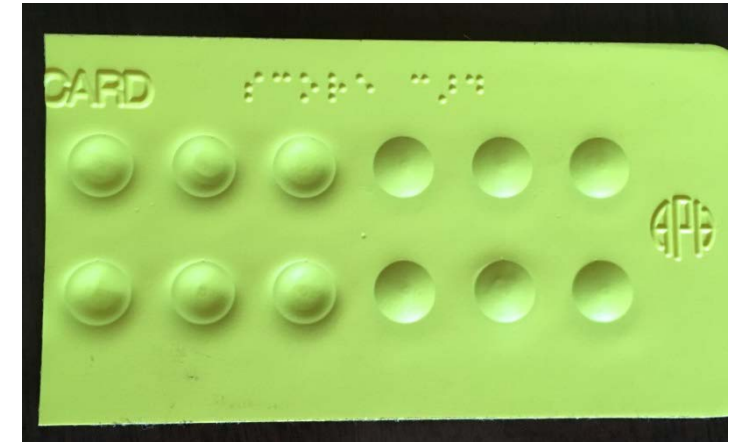
Add 247 and 325

Table			
247	+300	⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠⠠⠠
547	+20	⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠
567	+3	⠠⠠⠠⠠⠠⠠	⠠⠠
570	+2	⠠⠠⠠⠠⠠⠠	⠠⠠
572		⠠⠠⠠⠠⠠⠠	



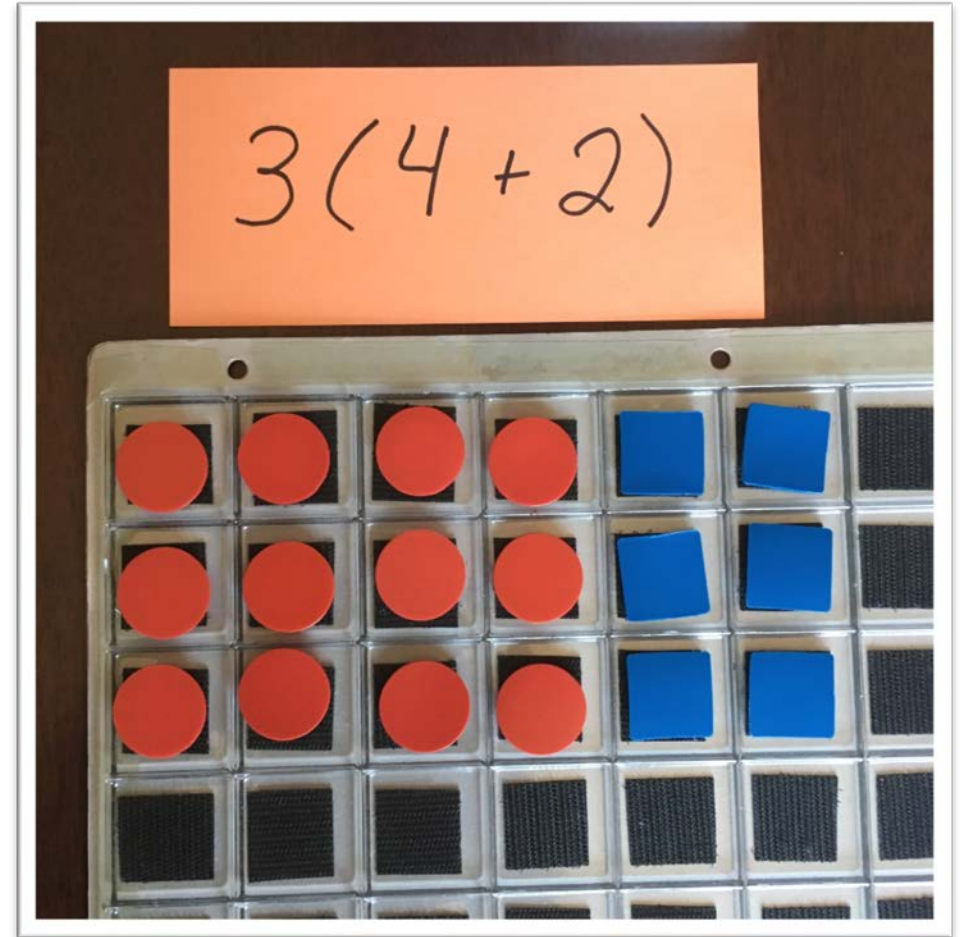
Fraction Skills Taught in Second Grade

- Sighted students partition paper rectangles into parts.
- Braille users can use APH Score Cards cut down to represent different fractions.
- 2 by 6 – halves, thirds, fourths, and sixths
- 2 by 5 – halves and fifths



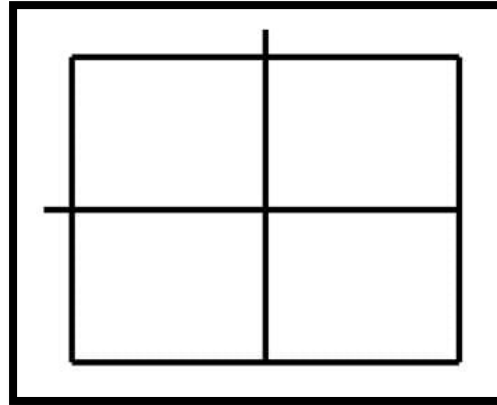
Distributive Property

- Third grade skill
- Use area model to do $3(4+2)$
- Using the 100s board and manipulatives student can see the different parts of the problem (e.g., 3×4 and 3×2)

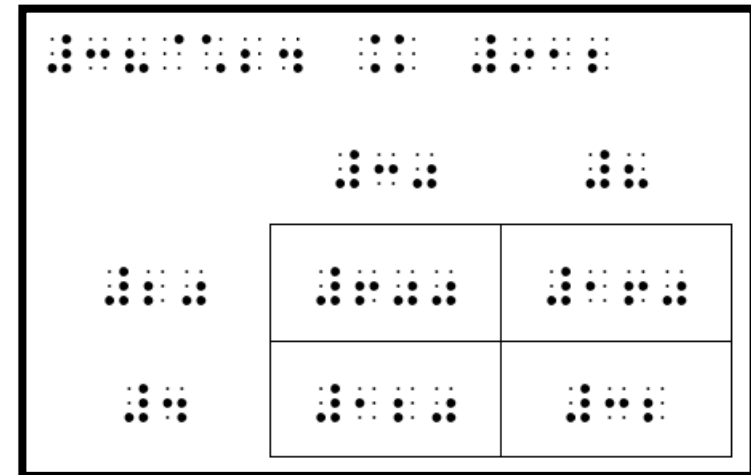


Multiplication

- Third grade skill
- Students are introduced to a window or grid model
- Ways to represent window or grid models for braille readers that they can braille on:
 - Graphics art tape on braille paper
 - Punnett Squares (used in science class for dominant and recessive genes)



38 x 24 = 912		
	30	8
20	600	160
4	120	32



Fraction Skills

- Third and Fourth Grade Concepts
- APH Math Builders Fraction Kit
 - Fraction Tiles and Circles
 - Hint: Put the braille labels on the pieces **before** leaving the materials in the general education classroom!
- Visual Fraction Models
- Partitioning fractions
- Comparing and equivalent fractions



Using the APH Number Line Device to Compare Fractions

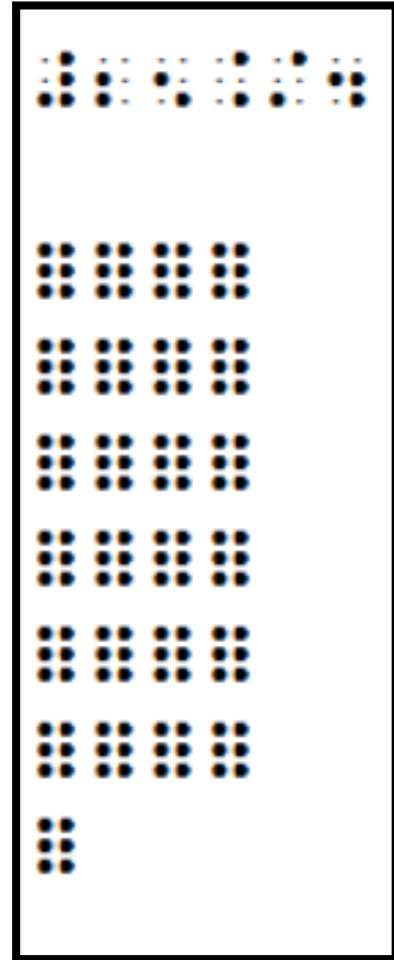
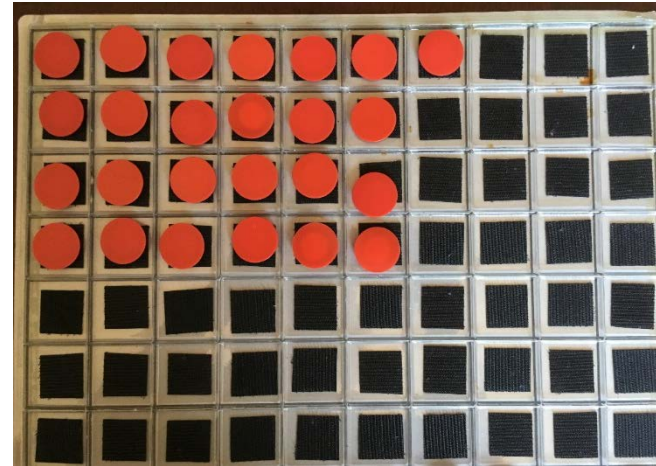
- Using the strips and pegs, the student can mark different values.
- Not all strips are equivalent so be careful. For example, fifths and thirds don't have the 1 in the same location. Use the whole number strip with 15 representing the whole.



Division with a Remainder

$$25 \div 4$$

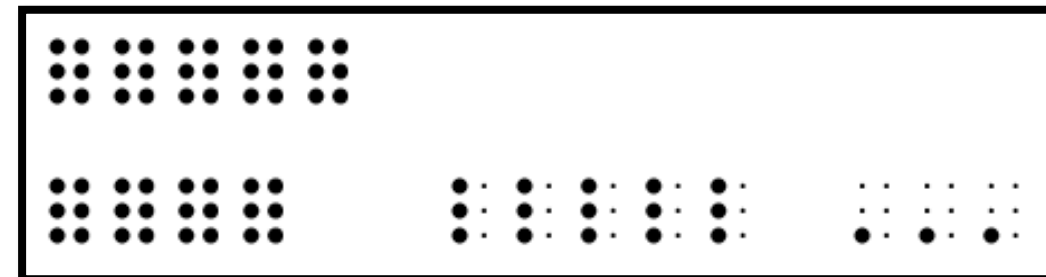
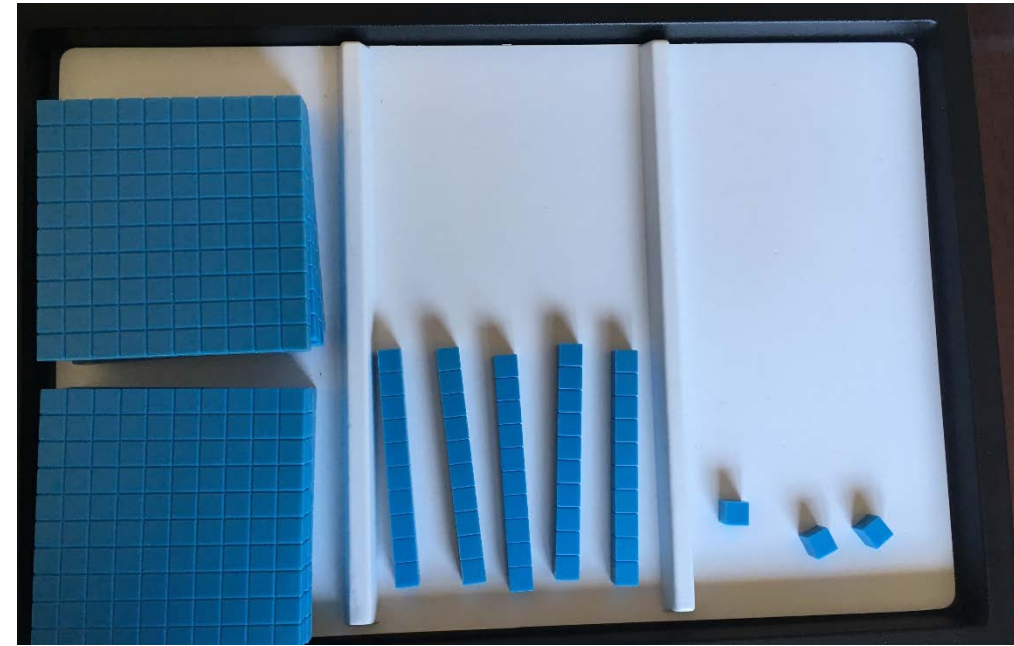
- Fourth grade skill
- APH 100s Board can be used to help students understand the concept of "remainder."
- Braillewriter can be used to show groups of 4 in each row until you reach 25.
- Key is "groups of 4" not whether the groups of 4 are in the rows or columns.



Comparing Decimals

- Fourth grade skill - 2 decimal places (hundredths)
- Fifth grade skill - 3 decimal places (thousandths)
- Students learn to **compare** decimals.
- Base 10 blocks or a braillewriter can be used to represent decimals.
- Some students will find it easier to use the braillewriter so they don't have to move between manipulatives and braillewriter.

Is .453 greater or less than .5?



Comparing Decimals, Another Tool

- The APH Math Builders Fraction Kit has decimal tiles that are in increments of 0.1, 0.2, 0.25, and 0.5.
- Some tiles have one decimal place and some have two decimal places.

$$0.5 < 0.8$$
$$4 \times 0.2 = 0.8$$



Rounding Decimals

- Fifth grade skill
- The APH Number Line Device works well for teaching students to round decimals.
- Wikki Sticks can be used to mark on the APH Number Line Device.

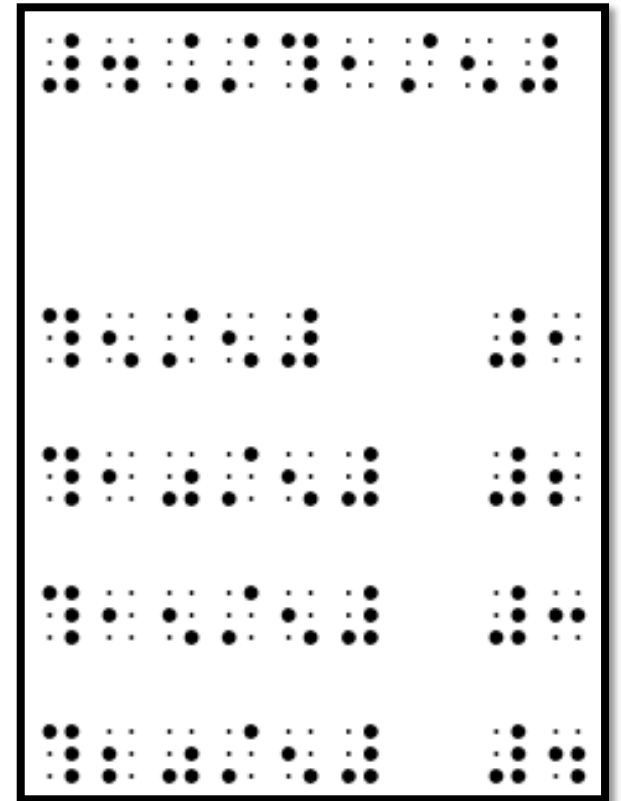


Dividing a Whole Number By a Fraction

$$4 \div \frac{1}{5}$$

- Grade 5 concept
- Have the student use a table to examine how many fifths are in 4.
 - How many fifths in 1?
 - How many fifths in 2?
 - etc.

$\frac{5}{5}$	1
$\frac{10}{5}$	2
$\frac{15}{5}$	3
$\frac{20}{5}$	4

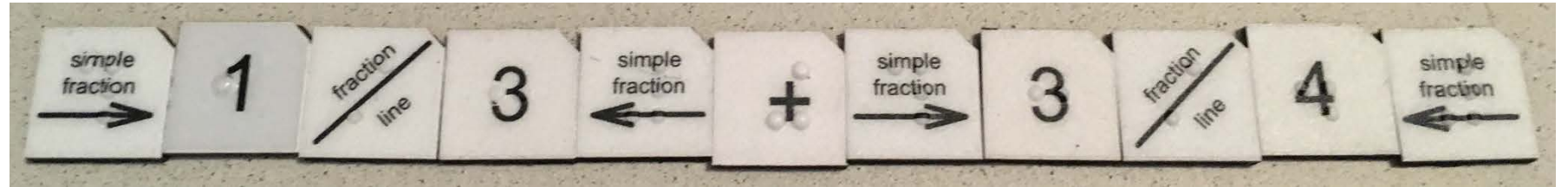


Adding Fractions with Unlike Denominators

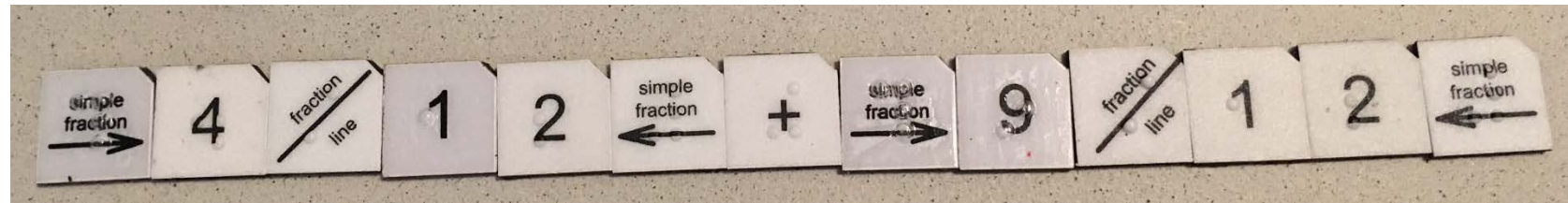
- Students have options
 - Braillewriter
 - Abacus
 - Math Window
- Math Window cautions:
 - Teachers and paraprofessionals must use the correct symbols (e.g., open fraction indicator).
 - Expecting a student to set up and show work for a complex problem is time consuming!
 - Pay attention to tile labels!
 - Indicators are different for each type of fraction.
 - Sets have a limited number of tiles.

Using a Math Window to Add Fractions with Unlike Denominators

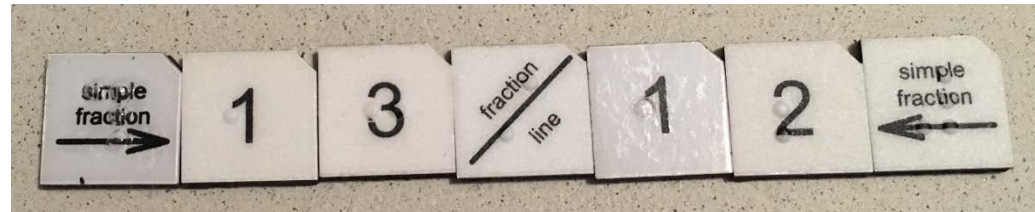
$$\frac{1}{3} + \frac{3}{4}$$



$$\frac{4}{12} + \frac{9}{12}$$



$$\frac{13}{12}$$



$$1\frac{1}{12}$$

