

Break the Cycle of Failure

Save Struggling Students with Math RTI

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Objectives

1. Why?
 2. How does it work?
 3. What are 3 lessons?
-

Partial Bibliography

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“Decisions about core curriculums, instruction, climate, behavioral systems and interventions are not driven by educational ‘philosophy’ or the opinions of individuals. Rather, these decisions are driven by data, especially by student assessment data, with explicit rules for making decisions.”

CT State Dept. of Education, *Connecticut’s Framework for RTI*, p. 20

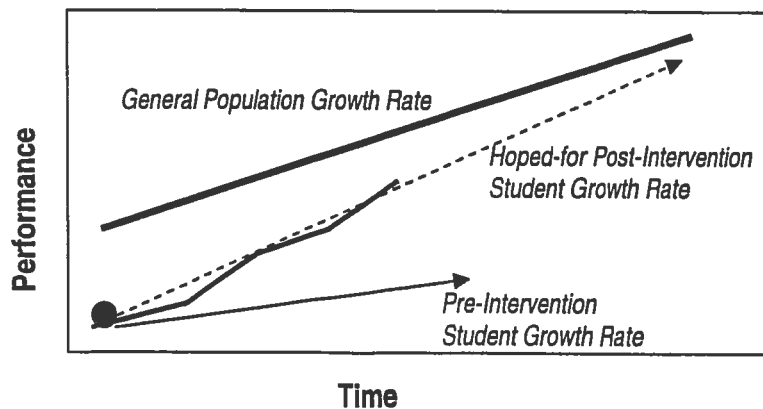
SRBI Vocabulary

| | |
|----------------------------|--|
| Intervention | An instructional program used to address a specific student need |
| RTI | Response to Intervention, a model that increases the intensity of interventions in order to impact performance and rate of growth |
| SRBI | Scientific Research-Based Interventions (<i>CT Dept. of Education’s version of RTI</i>) |
| Tier I | general education classroom |
| Tier II | additional time beyond the classroom for a planned program of small group remediation and diagnostic interventions (<i>typically 6-20 weeks</i>) |
| Tier III | more intensive interventions |
| Universal Screen | a performance level assessment of the entire population |
| Progress Monitoring | frequently used set of assessments to show rate of growth of a student |

Model for Identifying Special Education (Connecticut)

Dual Discrepancy Model = Low performance and low rate of growth

The focus is to increase the rate of growth with strategic interventions and progress monitoring to assess the impact of the interventions.



After three years of anger and frustration...
Now I can do long division!

Why Math Excellence Lab?

Math Excellence Lab is extra math help so you can master math skills in place value, decimals, fractions, integers, multiplication; and *learn how to reach your goals.*

You were chosen from over 1,000 students based on five math tests and your math teacher's recommendation. *Your math teacher believes in you, because you have shown you will make the most of this limited opportunity.*

How does Math Excellence Lab work?

Changing Our Mindsets

You develop a growth mindset because you see your ongoing effort earns success and because you deserve to improve yourself.

Because we use cutting-edge methods, you try new things, you learn how your brain works, and you grow in a caring climate.

Improving Our Math Skills

You work in small groups, get one-on-one tutoring, and use online software. **You test often and quickly correct to fill gaps in your understanding.**

Because we break math problems into successful small steps, you gain dependable skills. **Your effort and perseverance leads to success and mastery.**

These small successful steps compound and progressively move you forward.

Math Excellence LabTM
We care, I can

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Student Name

P

| | | | 1st Score | Date | 2nd Score | Date |
|-----------------------|------------------|-----------------|-----------|------|-----------|------|
| In-6 | 2MB[REDACTED]I | Integers 6 | | | | |
| In-5 | 7C[REDACTED]O | Integers 5 | | | | |
| In-4 | JID4[REDACTED]E2 | Integers 4 | | | | |
| In-3 | GY[REDACTED]TC | Integers 3 | | | | |
| In-2 | PRK9[REDACTED]Q | Integers 2 | | | | |
| In-1 | A[REDACTED]Y | Integers 1 | | | | |
| <i>Starting Point</i> | | Integer Pretest | | | | |

I need
3 Quizzes
70%
 or Greater
 in each
 area:

- Integers
- Fractions
- Decimals
- Multiplication
- Place Value

HR-### HRTeacher
 TeamLeader TeamCodeXX Team

| | | | | | | |
|-----------------------|-----------------|------------------|--|--|--|--|
| F9 | IX[REDACTED]6F | Fraction 9 | | | | |
| F8 | NNQ[REDACTED]X | Fraction 8 | | | | |
| F7 | LN[REDACTED]XZ | Fraction 7 | | | | |
| F6 | D[REDACTED]D39G | Fraction 6 | | | | |
| F5 | IL7V[REDACTED]H | Fraction 5 | | | | |
| F4 | VB6[REDACTED]A | Fraction 4 | | | | |
| F3 | OG[REDACTED]YI | Fraction 3 | | | | |
| F2 | L[REDACTED]H7 | Fraction 2 | | | | |
| F1 | F[REDACTED]7I | Fraction 1 | | | | |
| <i>Starting Point</i> | | Fraction Pretest | | | | |

| | | | | | | |
|-----------------------|-----------------|-----------------|--|--|--|--|
| D9 | WIF[REDACTED]D | Decimal 9 | | | | |
| D8 | N6M[REDACTED]KT | Decimal 8 | | | | |
| D7 | OC[REDACTED]CBA | Decimal 7 | | | | |
| D6 | 9U[REDACTED]NK7 | Decimal 6 | | | | |
| D5 | 312[REDACTED]E | Decimal 5 | | | | |
| D4 | Q[REDACTED]L7IL | Decimal 4 | | | | |
| D3 | 8[REDACTED]UK8 | Decimal 3 | | | | |
| D2 | 9[REDACTED]U75 | Decimal 2 | | | | |
| D1 | R[REDACTED]CV | Decimal 1 | | | | |
| <i>Starting Point</i> | | Decimal Pretest | | | | |

| | | | | | | |
|-----------------------|------------------|------------------------|--|--|--|--|
| M4 | 3IH[REDACTED]BYX | Multiplication 4 | | | | |
| M3 | 9[REDACTED]XT | Multiplication 3 | | | | |
| M2 | XL[REDACTED]9W | Multiplication 2 | | | | |
| M1 | U2[REDACTED]T4 | Multiplication 1 | | | | |
| <i>Starting Point</i> | | Multiplication Pretest | | | | |

I am a hard worker.
 I am improving and
 I am getting better
 scores because
 I apply focused effort
 and
 I persist.

| | | | | | | |
|----|-----------------|------------|--|--|--|--|
| R6 | UX[REDACTED]4EQ | Rounding 6 | | | | |
| R5 | C[REDACTED]ZL1 | Rounding 5 | | | | |
| R4 | 7L[REDACTED]CQ | Rounding 4 | | | | |
| R3 | IM[REDACTED]OG | Rounding 3 | | | | |
| R2 | F5[REDACTED]G | Rounding 2 | | | | |
| R1 | 5DF[REDACTED]U | Rounding 1 | | | | |

| | | | | | | |
|-----------------------|-----------------|---------------------|--|--|--|--|
| PV5 | NB9W[REDACTED]F | PlaceValue 5 | | | | |
| PV4 | H[REDACTED]3QQ | PlaceValue 4 | | | | |
| PV3 | MS[REDACTED]CU | PlaceValue 3 | | | | |
| PV2 | IB[REDACTED]OR | PlaceValue 2 | | | | |
| PV1 | TLE[REDACTED]EL | PlaceValue 1 | | | | |
| <i>Starting Point</i> | | Place Value Pretest | | | | |

Home #
 Cell #
 Parent Name(s)

MEL Snapshot Data

The World Rewards Effort

thatquiz.org

Group 7GS

ThatQuiz Data

% Percent of Students

TQ Score Summary

| | P | R | M | D | F | I | |
|-----------------------------------|---|----|----|-----|----|----|----|
| SRBI Goal: 3 Quizzes @ 70%+ Score | 3 | 98 | 54 | 100 | 77 | 63 | 52 |
| 1 or more > 70%+ Score | 1 | 98 | 67 | 100 | 90 | 69 | 52 |

| Grade | Place Value | Rounding | Multiplication | Integers | Fractions | Decimals |
|-------|-------------|----------|----------------|----------|-----------|----------|
| 7 | 3 | 3 | 3 | 3 | 3 | 3 |
| 7 | 3 | 1 | 3 | 3 | 3 | 3 |
| 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| 7 | 3 | 1 | 3 | 1 | 3 | 3 |
| 7 | 3 | 3 | 3 | 3 | 3 | 3 |
| 8 | 3 | 1 | 3 | 1 | 3 | 3 |
| 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| 7 | 3 | 3 | 3 | 3 | 3 | 3 |

P 1
1
2
3
4
5
6
7
8
9
10

P 2
1
2
3
4
5
6
7
8
9
10
11

P 4
1
2
3
4
5
6
7
8
9
10

P 6
1
2
3
4
5
6
7
8

P 7
1
2
3
4
5
6
7
8
9
10

Total # of Students Served = 48
(excludes expelled student)

Raw Totals

| | | | | | | |
|------------------------------|----|----|----|----|----|----|
| Students with 3 scores 70%+ | 47 | 26 | 48 | 37 | 30 | 25 |
| Students with 1 or more 70%+ | 47 | 32 | 48 | 43 | 33 | 25 |

~~XXXXXXXXXX~~

~~XXXXXXXXXX~~

I need 3 scores > 70% in each of the following areas:

- Integers
- Fractions
- Decimals
- Multiplication
- Place Value

~~DONE~~

~~DONE~~

~~DONE~~

Math Excellence Lab

| | 1st Score | Date | 2nd Score | D |
|----------------|-----------------|------------|-----------|--------|
| In-6 | XGBR9782 | Integers 6 | | |
| In-5 | MPHH0218 | Integers 5 | | |
| In-4 | KYDR3906 | Integers 4 | 80 | 6/15 ✓ |
| In-3 | ADGQ8328 | Integers 3 | 87 | 6/15 ✓ |
| In-2 | RRTZ7038 | Integers 2 | 73 | 6/13 ✓ |
| In-1 | AVGV7956 | Integers 1 | 67 | 6/13 ✓ |
| Starting Point | Integer Pretest | 40 | | |

| | | | | | |
|----------------|------------------|------------|----|-----------|--------|
| F9 | TXKC8215 | Fraction 9 | 50 | 6/13 ✓ | |
| F8 | UGYB2792 | Fraction 8 | 80 | 6/13 ✓ | |
| F7 | NQKU2609 | Fraction 7 | 40 | 6/15 ✓ | |
| F6 | BVKH8748 | Fraction 6 | 50 | 6/15 ✓ | |
| F5 | LEJE0091 | Fraction 5 | 50 | 6/13 ✓ | |
| F4 | XXXXXXXXXX | Fraction 4 | 50 | 6/14 ✓ | |
| F3 | LWUX8034 | Fraction 3 | 40 | 5/31 ✓ 90 | 6/15 ✓ |
| F2 | XGEB8712 | Fraction 2 | 40 | 6/11 ✓ 40 | 6/15 ✓ |
| F1 | HEYB2744 | Fraction 1 | 20 | 5/25 ✓ 60 | 6/15 ✓ |
| Starting Point | Fraction Pretest | 70 | | | |

| | | | | |
|----------------|-----------------|-----------|----|--------|
| D9 | AVAS0395 | Decimal 9 | | |
| D8 | PTQG8879 | Decimal 8 | | |
| D7 | YGSK7451 | Decimal 7 | | |
| D6 | WAEI0753 | Decimal 6 | | |
| D5 | XXXXXXXXXX | Decimal 5 | | |
| D4 | YLSH3306 | Decimal 4 | 70 | 4/25 ✓ |
| D3 | LXHM2267 | Decimal 3 | 90 | 4/25 ✓ |
| D2 | TNGV8212 | Decimal 2 | 30 | 4/10 ✓ |
| D1 | QJAC3467 | Decimal 1 | 30 | 4/4 ✓ |
| Starting Point | Decimal Pretest | 60 | | |

| | | | | |
|----------------|------------------------|------------------|----|--------|
| M6 | GHDY4543 | Multiplication 4 | | |
| M5 | GQBP2938 | Multiplication 3 | 72 | 6/18 ✓ |
| M4 | EMLH8284 | Multiplication 2 | 88 | 6/18 ✓ |
| M3 | TDZO1493 | Multiplication 1 | 84 | 6/14 ✓ |
| Starting Point | Multiplication Pretest | 28 | | |

| | | | | |
|----|----------|------------|----|--------|
| R6 | NMJF5930 | Rounding 6 | 20 | 6/15 ✓ |
| R5 | ZVDT8598 | Rounding 5 | 60 | 4/30 ✓ |
| R4 | TGVD8236 | Rounding 4 | 50 | 2/22 ✓ |
| R3 | WELQ4323 | Rounding 3 | 67 | 2/16 ✓ |
| R2 | MLRY2515 | Rounding 2 | 50 | |
| R1 | VDRJ2778 | Rounding 1 | 20 | |

| | | | | |
|----------------|---------------------|---------------|-----|--------|
| PV5 | PUQT2486 | Place Value 5 | | |
| PV4 | TKAX2202 | Place Value 4 | | |
| PV3 | ZZYP8486 | Place Value 3 | 100 | 2/15 ✓ |
| PV2 | RBUC2043 | Place Value 2 | 70 | |
| PV1 | YYIP3538 | Place Value 1 | 70 | |
| Starting Point | Place Value Pretest | 10 | | |

LeftOvers Game

The game of concrete long division estimation

How to play

Make several sets of differing amounts of pennies (ranging from 22 to 50 pennies per cup).

Label cups "A, B, C....)

Pair students and give each pair one number cube.

Give every pair of students a labeled cup (cup A, cup B, cup C, ...)

Have students play in pairs.

Each student has their own score sheet..

Play 9 games with 3 sets with different totals of pennies.

Predict First Before Counting Pennies

- 1. Choose a cup of pennies – gently pour out all pennies on the table and record the total number of pennies and the letter on the cup on the score sheet.*
- 2. Roll the number cube – record the number*
- 3. Estimate "How many groups of (the number) are there in the total?"*
- 4. Predict if you will have leftovers - or not*

Now Make Groups of the Cube's Number

- 5. Make groups pennies of the number shown on the number cube and record how many groups actually are in the total.*
- 6. Record if there are any leftovers.*
- 7. Scoring: If numbers of actual groups match estimate → earn 1 BONUS point
If leftovers prediction matches after making groups → earn 2 points.
(Maximum number of points earned for each game is 3 points.)*

Note:

- a. Play 3 games with each cup of pennies and play with 3 different amounts of pennies for a total of 9 games.*
- b. If a student rolls a "one" or the same number twice, then have them roll the number cube again.*
- c. Encourage students to make their own estimates of groups and predict leftovers independent from their partner.*

Leftovers Game

1. Choose a cup of pennies – count & record the amount
2. Roll the number cube – record the number
3. Predict if you will have leftovers - or not
4. Make groups of the number shown on the number cube
5. Fill in your score worksheet – write how many groups?
6. Any leftovers?
7. Were you correct in your prediction?

LeftOvers Game

Name _____

Play 9 Games

| Predict Before | | | | Now Make Groups | | Score |
|--------------------|---------------------------------|---|---|--|--------------------------------------|--|
| Total Pennies ↓ | What is the Number on the Cube? | Estimate: How many Groups of number are there in the total? | Predict: Will you have leftovers? Y or N | How many groups do you actually have? Match? Y or N How many groups? | Do you have any Leftovers? Y or N | Total Points +2 pts if leftovers match +1 Bonus pt if groups match (max. 3 pts. possible) |
| Cup | | | | | | |
| | | | | | | |
| | | | | | | |
| Cup | | | | | | |
| | | | | | | |
| | | | | | | |
| Cup | | | | | | |
| | | | | | | |
| | | | | | | |

A. What patterns do you notice?

Total Score →

| |
|--|
| |
|--|

B. What conclusions can you draw?

Subtract using Base 10 Blocks – Draw each step along the way.

MAKE SURE THE NUMBERS AND THE REPRESENTATION MATCH!

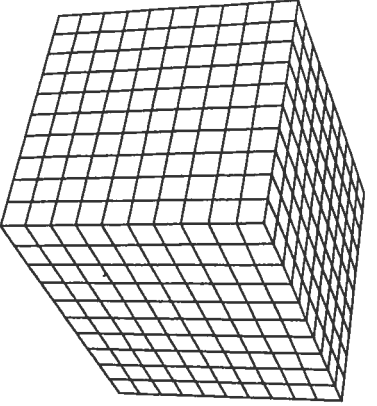
$$\begin{array}{r} 143 \\ - 56 \\ \hline \end{array}$$

BUILD AND DRAW YOUR STARTING NUMBER:

NOW SHOW EACH STEP YOU TAKE

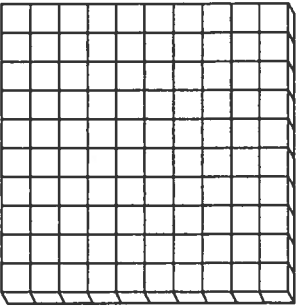
Thousands (1,000)

Cubes



Hundreds (100)

Flats



Tens (10)

Rods



Ones (1)

Units



Multiplying Triple Digits

Math Excellence Lab TM

I agree to give my **best effort** Per _____

Please Print Full Name _____

Expanded Form Review

.....Remember how Regrouping uses Place value?

1. → Please fill in the blanks with the correct value(s) on each line

| | <u>thousands</u> | | <u>hundreds</u> | | <u>tens</u> | | <u>ones</u> | | |
|-------|------------------|-------|-----------------|-----|-------------|----|-------------|---|-----------------|
| 3,251 | = | 3,000 | + | 200 | + | 50 | + | 1 | ← Expanded Form |

| | | | | | | | | |
|-------|---|-------|---|--|---|----|---|---|
| 3,251 | = | 2,000 | + | | + | 50 | + | 1 |
|-------|---|-------|---|--|---|----|---|---|

| | | | | | | | | |
|-------|---|-------|---|-----|---|--|---|---|
| 3,251 | = | 3,000 | + | 100 | + | | + | 1 |
|-------|---|-------|---|-----|---|--|---|---|

| | | | | | | | | |
|-------|---|-------|---|-----|---|--|---|----|
| 3,251 | = | 3,000 | + | 200 | + | | + | 11 |
|-------|---|-------|---|-----|---|--|---|----|

| | | | | | | | | |
|-------|---|-------|---|--|---|----|---|--|
| 3,251 | = | 3,000 | + | | + | 40 | + | |
|-------|---|-------|---|--|---|----|---|--|

2. Let's have some fun and see if we can challenge you a little more!

(Look closely!)

| | <u>thousands</u> | | <u>hundreds</u> | | <u>tens</u> | | <u>ones</u> | |
|-------|------------------|-------|-----------------|--|-------------|-----|-------------|----|
| 3,251 | = | 2,000 | + | | + | 140 | + | 11 |

| | | | | | | | | |
|-------|---|-------|---|-----|---|--|---|----|
| 3,251 | = | 3,000 | + | 100 | + | | + | 11 |
|-------|---|-------|---|-----|---|--|---|----|

Over for Side Two →

Using... **“Open Array”** Multiplication Uses Place Value to Explain:

→ “Why do we “Add Zeros” when we multiply by more than one digit?”

2. **23 x 32**

| | | | | | | |
|-------------|----|-------------------|---|------------------|--|----|
| | | <u>tens</u> 30 | + | <u>ones</u> 2 | | |
| <u>tens</u> | 20 | | + | | | => |
| <u>ones</u> | 3 | | + | | | => |

| | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | |
| + | | | | | | | | | | |

Now compare “Open Array” to what you have already learned. What do you notice?

32

x 23

3. **132 x 24**

| | | | | | | |
|-----------------|--|-------------|---|-------------|--|----|
| | | <u>tens</u> | + | <u>ones</u> | | |
| <u>hundreds</u> | | | + | | | => |
| <u>tens</u> | | | + | | | => |
| <u>ones</u> | | | + | | | => |

| | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | |
| + | | | | | | | | | | |

24

x 132

Dividing by Decimal Numbers

Math Excellence Lab

I agree to give my **best effort** Per _____

Please Print Full Name _____

| | | | |
|--------------|------------|-----|------------|
| | Divisor | | Quotient |
| $8 \div 8$ | \swarrow | $=$ | \searrow |
| $8 \div 4$ | | $=$ | |
| $8 \div 2$ | | $=$ | |
| $8 \div 1$ | | $=$ | |
| $8 \div .5$ | | $=$ | |
| $8 \div .25$ | | $=$ | |

How is the Divisor & Quotient changing??

| | | | |
|-------------------|------------|-----|------------|
| | Divisor | | Quotient |
| $1000 \div 1000.$ | \swarrow | $=$ | \searrow |
| $1000 \div 100.$ | | $=$ | |
| $1000 \div 10.$ | | $=$ | |
| $1000 \div 1.$ | | $=$ | |
| $1000 \div .1$ | | $=$ | |
| $1000 \div .01$ | | $=$ | |

How is the Divisor & Quotient changing??

Summarize what is happening.....

#1a) When the Divisor gets smaller, the answer (quotient) gets _____, and

1 b) ... the Quotient grows bigger by (what?) _____.

→ So what answer do we expect for these three questions? $9 \div 3 =$ _____
 $9 \div .3 =$ _____
 $9 \div .03 =$ _____

→ Now how do we **apply** it to our Long Division Algorithm

Here's **WHY** we move the Decimal Point (by multiplying by a Common Factor of 10,100, etc.)

$$\frac{9}{.3} \times \frac{?}{?} = \frac{?}{?}$$

$$\frac{9}{.03} \times \frac{?}{?} = \frac{?}{?}$$

$$3 \overline{)9}$$

$$.3 \overline{)9}$$

$$.03 \overline{)9}$$

D_ _____
M_ _____
S_ _____
C_ _____
B_ _____

Dividing by Decimal Numbers

Math Excellence Lab

I agree to give my **best effort**

4 whole units \div **2** (two ones)

divided into groups of

→ = _____

4 whole units \div **.2** (two tenths)

divided into groups of

→ = _____

→ Fill in the blank with **“Equal”** or **“Not Equal”** in the space below, and explain why below.

4 \div **2** is _____ to **4** \div **.2**
 (“Equal” or “Not Equal”)

I believe the two expressions are _____ because: _____
 (“Equal” or “Not Equal”)

Multiplying Decimals

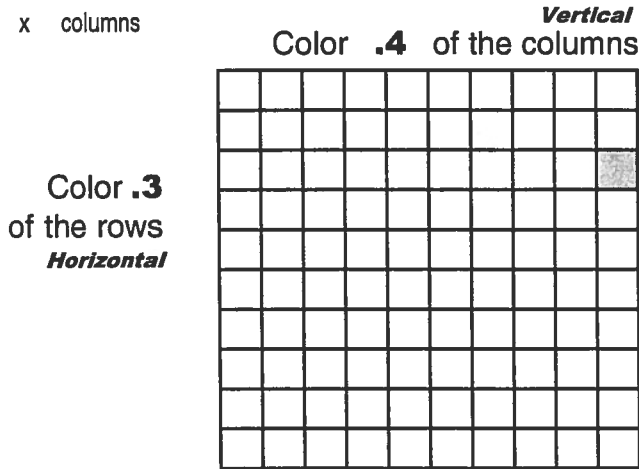
I agree to give my **best effort** Per _____

Math Excellence Lab TM

Please Print Full Name _____

Directions: Below is a Hundredths Grid
 → Draw the equation shown on the grid to find the answer

1. **.3 x .4 =** _____
rows x columns

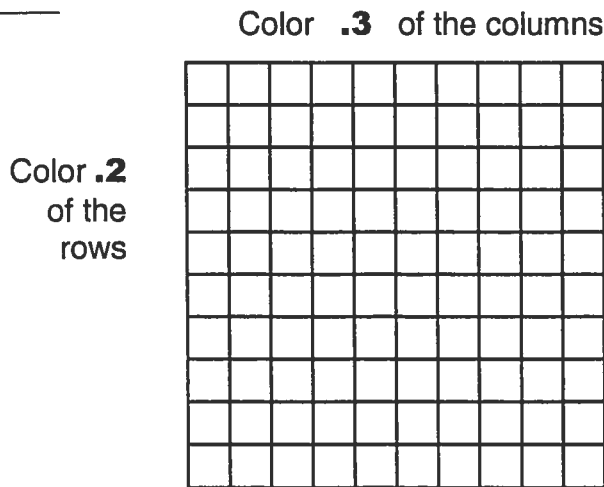


KEY

Hundredths Grid = 1 Whole

| | Fraction | Decimal |
|-------------------|-----------------|---------|
| One Square = | $\frac{1}{100}$ | . |
| One Column = | _____ | . |
| One row = | _____ | . |
| 10 rows = | _____ | . |
| 10 columns = | _____ | . |
| ALL 100 Squares = | _____ | . |

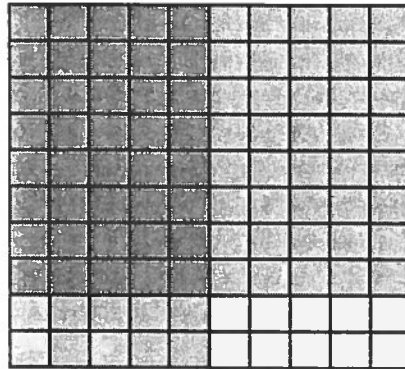
2. **.2 x .3 =** _____
rows x columns



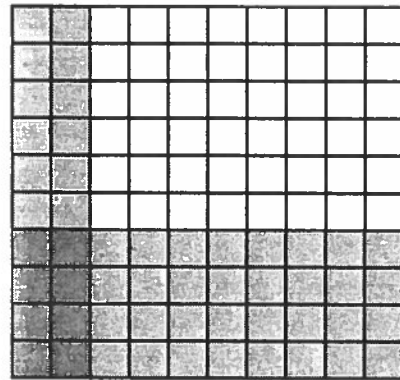
Over for Side Two →

Directions: Write the Equation that goes with this shaded **Hundredths Grid**

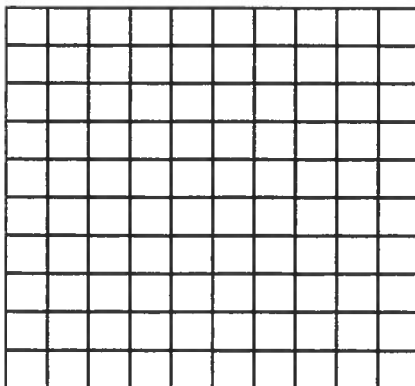
3. \bullet _____ **x** \bullet _____ = _____
 rows x columns



4. \bullet _____ **x** \bullet _____ = _____
 rows x columns



Directions: Create your own problem and answer.....and show it on the **Hundredths Grid**



5. \bullet _____ **x** \bullet _____ = _____
 rows x columns