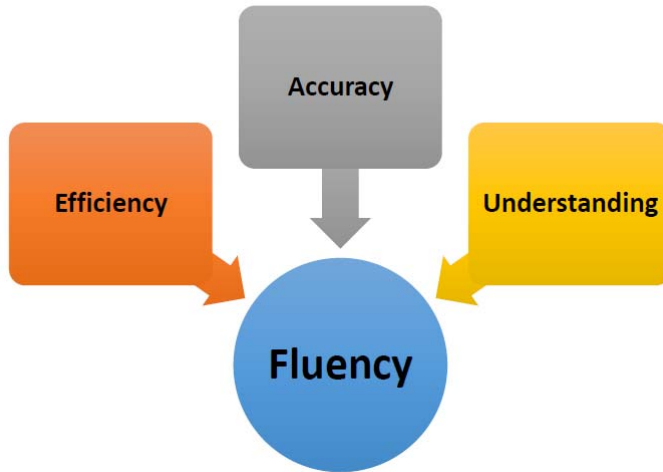




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# Time's Up on Timed Tests

## How to Teach Multiplication Facts for Understanding



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**Henry B. Gonzalez Conv. Ctr. 225**



## Developing Understanding—Multiplication with Meaning

The purpose of this journal is to help students develop a conceptual understanding of multiplication. By teaching multiplication facts using a concrete-pictorial-abstract approach, students will develop a solid foundation for fact fluency. Students should begin to see patterns and pictures within the facts which will develop mental math strategies.

The suggested sequence to teach the facts is: 10, 5, 2, 4, 8, 3, 6, 9, 7. By teaching in this order students can discover the connections between multiplying by 10 and 5; 2, 4, and 8; 3, 6, and 9; and finish up with 7. This is not a quick process, prepare to move slow so you can move fast later!

## Patterns in Multiplication, Multiplication Equations

1. Hand out counters (i.e. unifix cubes, beans, etc.) to students.
2. Begin by asking, "How many groups of 10 do you have?" "How many counters have you used?"
3. Students should color in "0" on the hundreds board and record  $0 \times 10 = 0$  on page 2.
4. Tell students to make 1 group of 10.
5. On the hundreds board color in the total number of counters used. On page 2, record the equation  $1 \times 10 = 10$ .
6. Ask students to read the equation they just wrote. When they read it, have them use the words "groups of" instead of "times". This will help students visualize the groups they just created with the counters.
7. Repeat steps 4-7 until the hundreds board is complete. There is enough room to record equations for up to 40 groups. Let students discover their own patterns. Stop frequently to ask what patterns they're noticing. Avoid giving students quick fixes or shortcuts.



## Patterns In Multiplication

x \_\_\_\_\_

									0
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

## Multiplication Equations

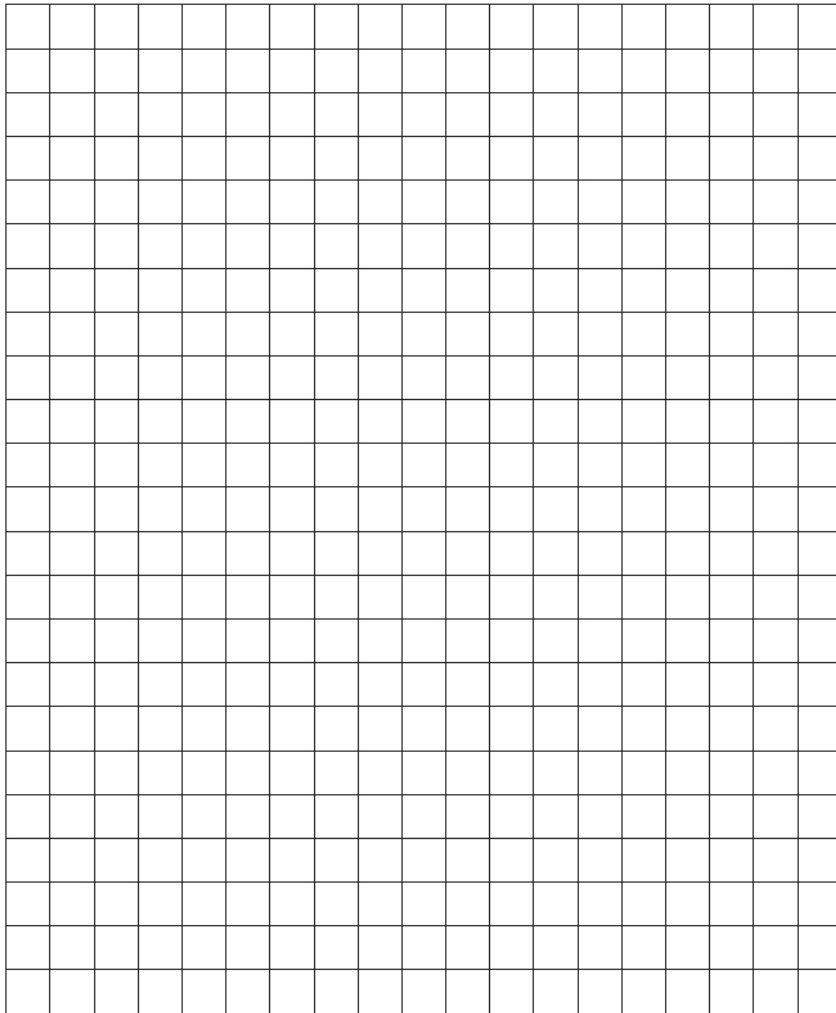
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## Area Models

1. Students will use these pages to create area models for their equations. Have them begin by coloring in an area for  $1 \times 10$ .
2. Once the area is colored in record the equation underneath the model, for example:  $1 \times 10 = 10$ .
3. Have students turn their journal sideways and record the new equation they see-- $10 \times 1 = 10$ . Use this visual to illustrate and teach the commutative property.
4. Repeat steps 1-3 for area models up through 10 groups.

## Area Models



## Real World Connection Story

1. The purpose of this page is to make the connection to the real world, their world. Let students decide which level of understanding applies to them...

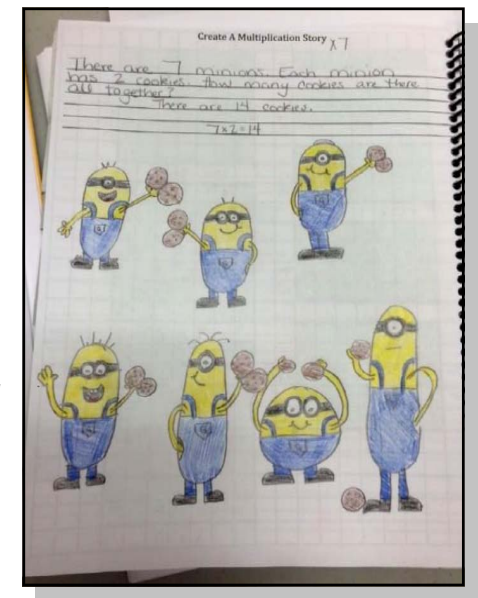
Level 1—basic knowledge level of multiplying by 10; write a real world story problem multiplying 10 by 1-10.

Level 2—solid knowledge of multiplying by 10; write a real world story problem multiplying 10 by 11-99.

Level 3—challenge level; write a real world story problem multiplying 10 by a three or four digit number.

2. Students should create a visual representation for their problem. For example, it can be a basic picture that mirrors the story; a bar model or tape diagram; or an array or area model. You could challenge students to show their thinking using one or more of these suggestions.
3. Students should record the correct equation that matches the problem.
4. Students should provide an answer sentence that correctly answers the question.

*\*It is important to let students use topics and content that are relevant and meaningful to them! This is not a whole class direct instruction process where everyone draws basketballs. Students choose their meaning and their content for their multiplication representation.*





## Real World Connection Story

My x\_\_\_\_\_ math story:

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Visual Representation

Equation \_\_\_\_\_

Answer Sentence



## Extension

This page is for extensions to the multiplication instruction (i.e. the math facts, strategies for multiplication, patterns they've observed, etc.) they've now had.

### *Have the student:*

- Write a descriptive paragraph about multiplication
- Write/illustrate additional multiplication and/or division real world stories
- Plan, write and illustrate a multiplication story using a favorite children's book mentor text
- Play a favorite game with a younger buddy from a class in a lower grade
- Design an anchor chart for their classmates that can later be enlarged for whole class use
- Create their own extension

### *As a teacher you could:*

- Teach a game and have students record directions in a jotted format, or as a "how to" informational paragraph
- Teach distributive property and have students practice decomposing the numbers
- Compare and contrast multiplication and repeated addition-- how are they similar how are they different
- Explain the connection between multiplication and division (take a number they're working on then demonstrate how this relates to division)
- Challenge students to create their own extension

### **Throughout the process consider asking questions of your students such as:**

- "Why are you correct?"
- "What do you see?"
- "What relationship do you notice between the factors (for example 2, 4, and 8)?"
- "Is there another way?"
- "Can you show me?"



## Tic-Tac-Toe Multiplication

1	2	3	4	5	6
7	8	9	10	12	14
15	16	18	20	21	24
25	27	28	30	32	35
36	40	42	45	48	49
54	56	63	64	72	81

1 2 3 4 5  
6 7 8 9



## Fluency Folders

Directions:

1. Fold one piece of paper (as a landscape) in half to create a long skinny landscape. Fold that paper in half to create a fourth-sized landscape (set aside).
2. Fold the second piece of paper (beginning as a landscape) to create a half-sized portrait.
3. Slide the half-sized portrait into the fourth-sized landscape to create a four pocket folder.
4. Tape each side of the pockets to prevent items from falling out of the pockets.
5. Glue the small multiplication chart on the front of the folder and label that pocket "My Goal".
6. Open the folder and label the left hand side pocket "Practicing".
7. Label the right side pocket of the inner folder "Show What I Know".
8. Close the folder and label the back pocket "Ready to Celebrate".
9. Students determine which math facts they need practice on. Predictably they are often the 6s, 7s, and 8s. They create flash cards for one set to practice until they are fluent. The front side of the flash card should be a traditional math fact (i.e.  $7 \times 4$ ). The back side should be pictorial representations of this math fact (i.e. 7 groups of 4 items, or a  $7 \times 4$  array, or  $7 \times 2$  plus  $7 \times 2$ ). The back should also include an answer. (While working with students emphasize strategies such as double double for 8's, for 7's using the distributive property and using what you know such as breaking 7 into 2 and 5.  $(2 \times 6) + (2 \times 5)$ ).



10. For students who already have the conceptual understanding, a one sheet practice card could be used (multiplication is on one side with the answers and division practice on the other).
11. Students practice their facts until they believe they are fluent (understanding + speed + accuracy). When they believe they're ready to be assessed they move their flashcards over to the "Assess" part of their folder and the teacher or volunteer check their fluency. If they are fluent their cards are moved to the "Celebrate" part of the folder, colored in on their multiplication chart, and a game is given to add to their "Practice" folder pocket to play while others are memorizing and working.
12. Students should use their extra time for practicing either through flashcards, partner checks, or games. It is something they may work on while they're waiting for others to finish.

#### Notes

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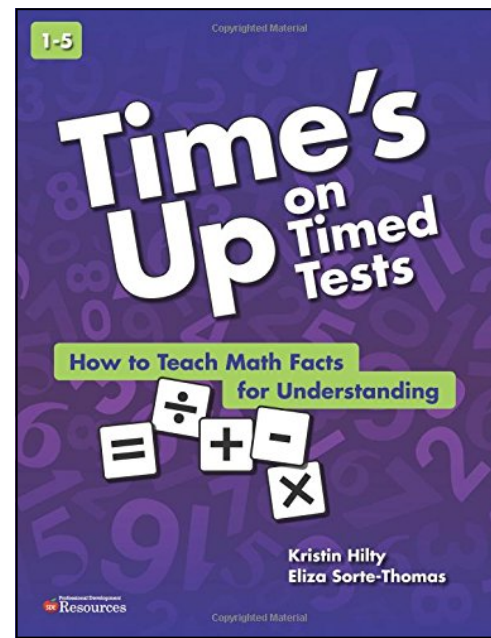
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