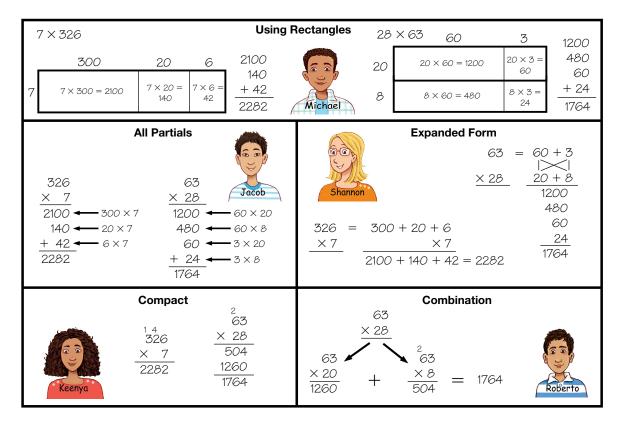
LETTER HOME

Multiplication with Larger Numbers

Dear Family Member:

In Units 4 and 7, your child learned to multiply using different strategies and methods. Now, your child will use this knowledge of multiplication to solve problems like 62×79 . As in the earlier units, students approach the problems using a variety of methods and strategies. By listening to each other and trying different ways, students develop a deeper number sense for multiplication and greater mental flexibility for solving problems. They learn to identify when an answer "doesn't seem right" and needs to be reworked.



Multidigit Multiplication Strategies Menu: Paper-and-Pencil Methods

Use the following activities to help your child at home:

Multiplication Strategies. Have your child show you how to solve a multiplication problem in different ways. See the Strategies Menu above. Ask about his or her favorite way. Challenge him or her to solve problems such as 5×48 or 99×7 using mental math.

Estimation Strategies. Continue to encourage estimation. Before solving a problem, ask about how big your child thinks the answer will be. After solving it, have him or her compare the estimate with the answer and ask, "Is the answer reasonable?"

Play the Multiplication Digits Game. In this game, students draw numbers from a set of Digit Cards 0–9 and place the digit on a multiplication playing board. The winner makes the largest product. Directions are in the *Student Activity Book.*

Math Facts and Mental Math

This unit continues the review of the division facts. Help your child using the activities below.

Division Facts. Students review the following division facts for the last six facts to maintain and increase fluency and to learn to apply division strategies to larger numbers.

Division facts for the last six facts:

42 ÷ 6, 42 ÷ 7, 24 ÷ 6, 24 ÷ 4, 28 ÷ 4, 28 ÷ 7, 32 ÷ 4, 32 ÷ 8, 48 ÷ 6, 48 ÷ 8, 56 ÷ 8, 56 ÷ 7

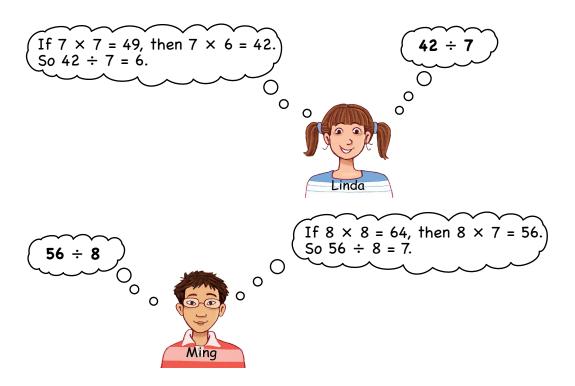
You can help your child review these facts using the Triangle Flash Cards that are sent home or by making a set of flash cards from index cards or scrap paper. Study the facts in small groups each night. As your child goes through the flash cards, put the cards in three stacks: Facts I Know Quickly, Facts I Can Figure Out, and Facts I Need to Learn.

For Facts I Need to Learn, work on strategies for figuring them out. Students should use multiplication facts they know to reason their way to a solution to a division fact.

<u>Start with the multiplication fact.</u> If your child does not know the multiplication fact related to the division fact, start by developing strategies to solve that multiplication fact.

<u>Turn-around facts.</u> To solve $28 \div 7$: I know $7 \times 4 = 28$, so $28 \div 7 = 4$.

Reasoning from known facts. To solve $32 \div 4$: I know $32 \div 2 = 16$, so $32 \div 4$ is half of 16. $32 \div 4 = 8$.



For Facts I Can Figure Out, use the flash cards to practice the facts for fluency.

For Facts I Know Quickly, help your child use strategies to solve problems like these using mental math:

Dividing 10s and 100s: 320 ÷ 8, 280 ÷ 70, 5600 ÷ 700

Thank you for taking time to talk with your child about what he or she is doing in math.

Sincerely,

Unit 11: Home Practice

Part 1 Triangle Flash Cards: Last Six Facts

Study for the quiz on the division facts for the last six multiplication facts ($24 \div 6$, $24 \div 4$, $28 \div 4$, $28 \div 7$, $32 \div 8$, $32 \div 4$, $42 \div 7$, $42 \div 6$, $48 \div 8$, $48 \div 6$, $56 \div 8$, $56 \div 7$). Take home your Triangle Flash Cards and your list of facts you need to study.

Ask a family member to choose one flash card at a time. He or she should cover the corner containing either the square or the circle, which will be the answer to a division fact. Solve a division problem with the two uncovered numbers. Repeat with the other small number covered.

Your teacher will tell you when you will have a quiz on the division facts for the last six facts. Study those facts you cannot answer correctly and quickly.

Part 2 Multiples of 10 and 100

Solve the following problems using Nila's method.

Nila solved 25 \times 20 like this:

 $25 \times 20 = 25 \times 2 \text{ tens}$ $25 \times 2 \text{ tens} = 50 \text{ tens}$ 50 tens = 500

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Part 3 Writing Numbers

For each of the following numbers, write two other numbers: one that is a little smaller and one that is a little larger. Use a number line to help you.

	A Little Smaller		A Little Larger
one million			
one-half million			
ten million			
1,300,000			
999,999			
five thousand			
	one-half million ten million 1,300,000 999,999	one million	one million

Part 4 The Shortcut

Decide if the following are divisible without actually dividing. Tell how you know.

- A. Is 5367 divisible by 2?
- **B.** Is 546,890 divisible by 10?
- C. Is 11,952 divisible by 6, 3, and 2?
- D. Is 74,981 divisible by 9?
- E. Is 431,895 divisible by 5 and 10?
- **F.** Give a three-digit number that is divisible by 9.
- **G.** Give a four-digit number that is divisible by 5.
- **H.** Which answers cannot possibly be the answer for 326 x 3? Fill in the circle by your answers. You can use the divisibility rules to explain your thinking.

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 Date

Name _____

Part 5 Addition and Subtraction Practice

Use paper and pencil or mental math only. Estimate to see if your answers are reasonable. Use the *Addition* and *Subtraction Strategies Menus* in the *Student Guide* Reference section.

Α.	92 <u>+ 65</u>		340 <u>- 235</u>	C.	58 <u>- 49</u>
D.	5001 <u>- 999</u>	E.	1490 <u>+ 453</u>	F.	289 <u>+ 39</u>

G. Ana solved 818 – 293 for homework. Here is her work and her estimate to check for reasonableness. She said, "Now I have finished my work."

818	800
- 293	- 300
685	500

What would you tell Ana? Is she finished?

Part 6 More Multiples of 10 and 100

Do the following problems in your head. Write only the answers.

A. 7 × 80 =	B. 70 × 60 =	C. 60 × 400 =
D. 600 × 800 =	E. 40 × 60 =	F. 70 × 800 =
G. 40 × 700 =	H. 40 × 800 =	I. 8 × 40 =

Part 7 Multiplication Methods

Solve these problems using the rectangle method, all-partials, or expanded form. Use the *Multidigit Multiplication Strategies Menu* in the Reference section of the *Student Guide*.

A. 58 x 26	B. 72 x 44
C. 93 x 65	D. 35 x 38

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Part 8 Money

Luis has 3 dimes, 3 nickels, and 3 quarters. Help him find all the possible amounts he can make using 3 of his coins. For example, using 3 dimes, 0 nickels, and 0 quarters, he has \$.30. Using 1 dime, 1 nickel, and 1 quarter, he has \$.40. Show how you organized your work.

Date _____

Part 9 Big Numbers

1. Write the following numbers:

A. six hundred thirty thousand _____

B. one million, four hundred ten thousand, nineteen _____

- **2.** Write the following in words. Use the *Writing Numbers in Words* page in the Reference section of the *Student Guide*.
 - **A.** 420,079 _____

- **B.** 6,122,038
- **3.** Choose from the following numbers to answer Questions 3A and 3B.

46,998	56,888	45,788	48,998	45,088
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A. If you add 2 to one of the numbers, you will get 49,000. Which number?

B. If you add 11,100 to one of the numbers, you will get 58,098. Which number?

Part 10 Gone Fishing

Choose mental math, paper-and-pencil methods, or estimation to solve the following problems. Do your work on this page. If you find an exact answer, estimate to make sure your answer is reasonable. Use the *Multidigit Multiplication Strategies Menu* in the Reference section of the *Student Guide* to help you.

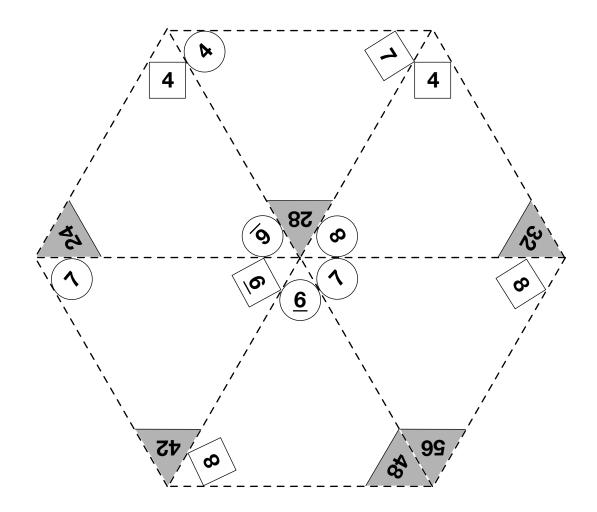
- **1.** The state fish hatchery buys fish food in 40 pound bags. Each bag costs \$26. Last year, the fish hatchery bought a total of 73 bags for their fish ponds.
 - A. How much money did the state fish hatchery pay for fish food last year?
 - B. How many pounds of fish food did the state fish hatchery buy in all?
- 2. Mr. Dawson's pond has an area of about 38 acres. He stocked his pond with about 50 trout, 50 bluegill, and 50 catfish for every acre. About how many fish did Mr. Dawson put into his pond in all? Show or tell how you arrived at your answer.

3. Gorski's Fish Hatchery allows people to catch fish from one of their docks. They allow up to 18 people on the dock during each "Catch-A-Fish-To-Eat" session. Gorski's offers 45 of these fishing sessions per week. What is the largest number of people who could fish from Gorski's dock in one week?

Date _

Triangle Flash Cards: Last Six Facts

- Work with a partner. Each partner cuts out the flash cards.
- To quiz you on a division fact, your partner covers the number in the square. Solve a division fact with the two uncovered numbers.
- Divide the used cards into three piles: Facts I Know Quickly, Facts I Can Figure Out, and Facts I Need to Learn.
- Practice the last two piles again. Then, make a list of the facts you need to practice at home.
- Go through the cards again. This time your partner covers the numbers in the circles.
- Sort the cards into the three piles. Make a list of the facts you need to practice at home.
- Repeat the directions for your partner.



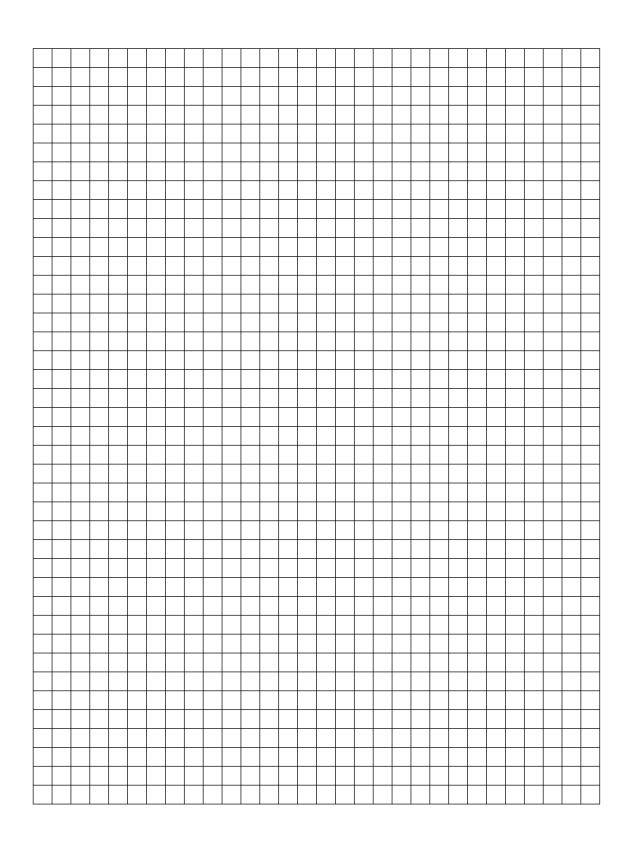
Division Facts I Know

- Circle the facts you know well.
- Keep this table and use it to help you divide.
- As you learn more facts, you may circle them too.

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

DIVISON

Half-Centimeter Grid Paper



Assessment Master

Date ____

Reviewer _

All-Partials Revisited Check-In: Question 18 Feedback Box

Name _____

	Yes	Yes, but	No, but	No
MPE1. Know the problem. I read the problem carefully. I know the questions to answer and what information is important.				
MPE3. Check for reasonableness. I look back at my solution to see if my answer makes sense. If it does not, I try again.				
MPE5. Show my work. I show or tell how I arrived at my answer so someone else can understand my thinking.				

Name _

Multiplication Quiz 1

Solve using the rectangle model, expanded form, the all-partials method, or mental math. Do not use a calculator. Estimate in your head to be sure your answers are reasonable. Use the strategies you recorded on the *My Multiplication Menu* page.

I. 78×4	2. 432 ×5
3. 23 × 75	4. 20 <u>×40</u>

5. 72 × 39

- 6. A. What convenient numbers did you use for your estimate for Question 3?
 - **B.** Choose two problems from Questions 1–5. Show or tell how you can solve them using mental math or a few quick notes.

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The Confused Contessa solved the problems in Questions 7, 8, and 9. Estimate to see if her answers are reasonable. Find her mistakes and draw a circle around the incorrect part. Then solve the problems correctly using her method.

Contessa's Work Your Estimate Your Solution 7. 63 = 60 + 320 + 7 imes 27 21 7×3 420 ← | 7 × 60 140 ← 20 × 7 20 imes 3+ 60 + 641 Contessa's Work Your Estimate Your Solution 95 8. imes 31 5 90 270 30 30 x 90 = 270 30 x 5 = 150 150 90 5 1 $1 \times 90 = 90$ 515 $1 \times 5 =$ 5 Your Estimate Contessa's Work Your Solution 9. 84 imes 46 24 48 16 + 32120

Name _

Food packages give information about the calories and fat in the food. Here are some examples.

Food	Serving Size	Servings per Box	Calories per Serving	Grams of Fat per Serving
fancy cookie	1	24	68	6
pizza	slice	8	170	9

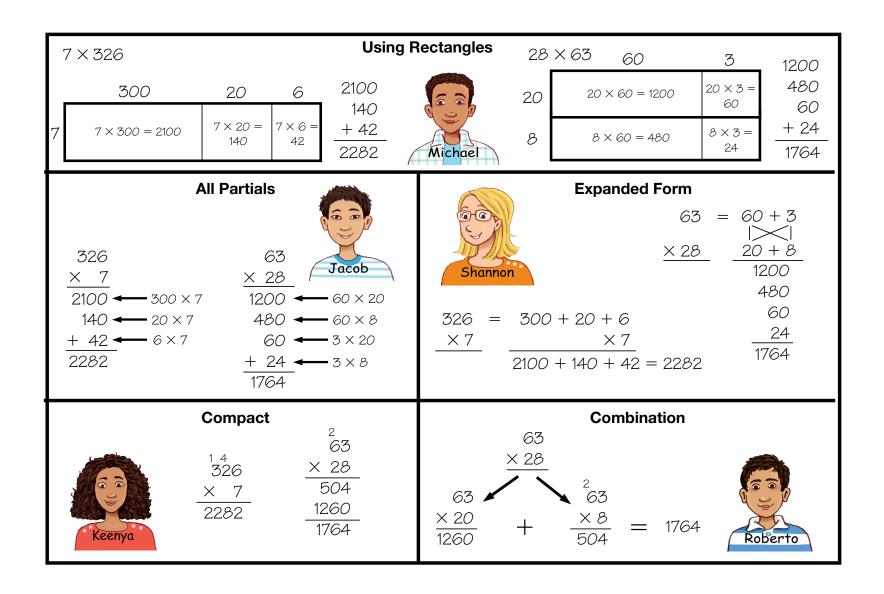
- **10.** How many calories are there in 3 slices of pizza? Show how you know.
- **II.** How many grams of fat are there in a whole box of fancy cookies? Show how you know.
- **12.** How many calories are there in a whole box of fancy cookies? Show how you know.

Multiplication Quiz 1 Feedback Box		Check In	Comments
Show how to use place value in multiplication. [Q# 7,8]	E1		
Estimate products. [Q# 6A]	E3		
 Multiply multidigit numbers. [Q# 1–12] Using mental math [Q# 6B] Using rectangles [Q# 8] Using expanded form [Q# 7] Using the all-partials method [Q# 9] 	E4		
Choose appropriately from among mental math strategies and paper-and-pencil methods to multiply multidigit numbers. [Q# 1–12]	E6		

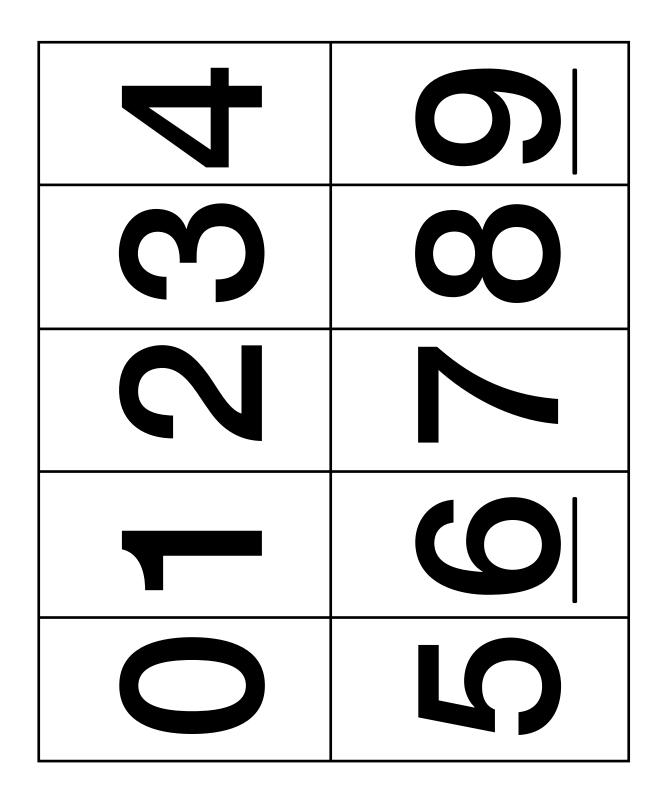
Mental Strategies Other Methods I Use **Using Simpler Numbers Using Convenient Numbers to Estimate** $205 \times 8 = (200 \times 8) + (5 \times 8)$ 63×28 1600 + 40 1640 60 = X 30 1800 $72 \times 99 = (72 \times 100) - 72$ 7200 - 721800 is a reasonable 7128 estimate. Ming Linda Halving and Doubling **Finding a Range** 45 X 65 264 X 5 I know multiplying by 10 is easier 40 × 60 = 2400 than multiplying by 5. I double 5 to 50 × 70 = 3500 10 and I take $\frac{1}{2}$ of 264 which is $132.132 \times 10^{-} = 1320$. Or | could The exact answer will be multiply $264 \times 10 = 2640$ and between 2400 and 3500. take half of that: 1320. or about 3000. Nicholas Ana

Multidigit Multiplication Strategies Menu Mental Math and Estimation

Multidigit Multiplication Strategies Menu Paper-and-Pencil Methods



Digit Cards 0-9



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Multiplication Quiz 2

- **1.** Solve these problems using any method you choose. Estimate to make sure your answers are reasonable.

 - **B.** 42 × 80 =
 - **C.** 53 × 28 =
 - **D.** 64 × 32
 - **E.** $40 \times 500 =$
 - **F.** Show your estimation strategy for Question 1C.
 - **G.** Choose two of these problems and show how you can solve them using mental math.

2. Grace drew this rectangle to solve a multiplication problem. She wrote the partial products but not the numbers along the sides. Fill in the circle next to the problem Grace was solving.

	30 × 40 = 1200	30 × 2 = 60
	8 × 40 = 320	8 × 2 = 16
○ A. 34 ×	24 = () B. 38 × 42 =

- \bigcirc **C.** 83 × 42 = \bigcirc **D.** 32 × 48 =
- **3.** Estimate an answer for 386×29 . Fill in the circle next to the most reasonable answer. Do not find the exact answer for the problem. Show how you estimated to the right.
 - A. 23,784
 - **B.** 1394
 - C. 13,644
 - **D.** 11,194
- 4. Draw a circle around the four partial products that you get when using the all-partials method to solve 62×58 .

8 × 20	80 imes 60	50 × 2	50 × 8
50 imes 60	50 imes 20	8 × 60	8 × 2

Name

5. Michael solved this problem using the compact method.

36×17
252
360
612

- A. What does the small 4 above the 3 mean?
- B. What did Michael multiply to get the partial product of 252?
- C. How did Michael get the 5 in the tens place in the first partial product?
- **D.** How did Michael get the 0 in the ones place in the second partial product?
- 6. Solve this problem from a math book from 1975: There are 45 families in an apartment building. Each family pays \$45 per week in rent and \$5 per week for electricity. How much money does the owner collect each week? Show or tell how you solve the problem.

Multiplication Quiz 2			
Feedback Box	Expec- tations	Check In	Comments
Demonstrate understanding of the place value concepts and mathematical properties involved in operations with multidigit numbers (e.g., use the distributive property to multiply). [Q# 2, 4, 5]	E1		
Show connections between models and strategies for multiplication (e.g., demonstrate partial products using a rectangle model for multiplication). [Q# 2]	E2		
Estimate products of multidigit numbers. [Q# 1F, 3]	E3		
 Multiply multidigit numbers using mental math strategies and paper-and-pencil methods (e.g., expanded form, all-partials). [Q# 1, 2, 4, 5, 6] Using mental math [Q# 1G] Using rectangles [Q# 2] Using all-partials [Q# 4] 	E4		
Multiply 2-digit by 2-digit numbers using the compact method. [Q# 5]	E5		
Choose appropriately from among estimation, mental math strategies, and paper-and-pencil methods to multiply whole numbers. [Q# 1, 6]	E6		

When Do We Estimate?

	Situation	Example #1	Example #2
1.	When we want to check if an answer is reasonable	After we use a calculator or paper and pencil to find an exact answer	
2.	When we want to find a quick answer in our heads	When we are estimating the cost of 20 cans of pet food at the store	
3.	When we don't need an exact answer	Finding the amount a school spends on electricity in one year to plan for the next year	
4.	When it is difficult or impossible to find an exact answer	The number of leaves in a forest	
5.	When numbers don't stay exactly the same over time	The value of five rare stamps (the price might change from one day to the next)	

Egyptian Numbers and Symbols

Egyptian Symbol	Number	Name
	1	stroke
	10	yoke
9	100	coil of rope
	1000	lotus blossom
2	10,000	bent finger
	100,000	tadpole
	1,000,000	Egyptian god