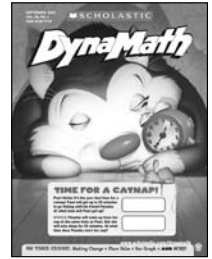


DynaMath

MOTIVATE AND EDUCATE!

TEACHER'S EDITION
Sept. 2010
 Vol. 29, No. 1
 ISSN 0732-7773



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You can find interactive whiteboard-friendly versions of select

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Mathematically yours,

Matt Friedman, Editor

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CONTENT AND SKILLS GUIDE

Difficulty Level: ★ = Easy ★★ = On-Level ★★★ = Challenging

PAGE	ARTICLE TITLE, DIFFICULTY LEVEL	PRIMARY MATH SKILL	SUPPLEMENTARY SKILLS/APPLICATIONS	NCTM STANDARDS (See below for details)
Cover	Time for a Catnap! ★★	Time +, -	Reading an analog clock	1, 2, 4 , 6, 8
2-3	Numbers in the News ★★	Mixed skills	Computation +, -, ×	1, 4 , 6, 8, 9
4-5	Fairy Tale Outlet ★★	Money math: making change	Decimal +, -	1 , 6
6-7	Wild World Records ★★	Word forms of numbers	Place value	1 , 8
8-9	Popular Pets ★	Reading a bar graph	Statistics	1 , 5, 6, 8
10-11	Tackle Problem Solving ★★★	Four-step problem solving	Choose the operation	1, 2 , 6, 7
12-13	Patrol Time ★	Reading a schedule	Telling time	1, 4 , 6, 8, 9
14-15	Up and ART 'Em ★★	Issue skills review	Test-taking practice	1, 4 , 5, 6, 7, 8
16	Emma's Estimation ★★	Estimating sums	Rounding whole numbers	1 , 8
T4	Expanded Numbers ★★	Expanded forms of numbers	pp. 6-7 extension	1 , 8
T5	Our Popular Friends ★★	Analyzing data	pp. 8-9 extension	1 , 7, 8, 9
T6	Problem Solved Prep Page ★★	Problem-solving skills	pp. 10-11 warm-up	1 , 6, 7, 8

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NCTM Standards		
1. Number and Operations	6. Problem Solving	Standards listed above in a bold box (such as 1) indicate that the article also connects with a new NCTM Curriculum Focal Point.
2. Algebra	7. Reasoning and Proof	
3. Geometry	8. Communication	
4. Measurement	9. Connections	
5. Data Analysis & Probability	10. Representation	

YOUR STUDENTS CAN WIN A DYNAMATH T-SHIRT!
 Ask your students to be on the lookout for interesting events or places that they'd like *DynaMath* to feature in "Numbers in the News." Have them send a copy of, or a Web link to, their news clip. If we use it in the magazine, they'll win a *DynaMath* T-shirt. See page 3 of this issue's student edition for details.

LESSON PLANS

2-3: NUMBERS IN THE NEWS

EXTENSION: FANTASTIC FLIGHT

Bonus question: An arctic tern travels about 1,500,000 miles in its lifetime. It travels about 50,000 miles each year. About how long is its lifespan? (Answer: about 30 years)

4-5: FAIRY TALE OUTLET

STRATEGY: USE ESTIMATION

Have students use estimation strategies to determine an approximate answer before answering each question. Then ask them if their final answers seem reasonable based on their estimates. Although there is more than one correct way to estimate, for this article, students may want to round each given value to the nearest dollar to make their estimates. For example, $\$9.10 - \5.75 would be about $\$9 - \6 . The difference would be about $\$3$.

STRATEGY: ALIGN PLACES

Be certain students understand the importance of aligning all decimal points: to align the place values of the numbers.

6-7: WILD WORLD RECORDS

STRATEGY: NAMING PERIODS

Explain to students that the commas also separate the names of the place-value periods that need to be written in word form before the commas in each number.

EXTENSION: DECK COUNT

If there are 52 cards in a deck of

cards, how many decks did Bryan Berg use in building the largest card house? Remember: He used 218,792 cards. (Answer: about 4,208 decks)

8-9: POPULAR PETS

STRATEGY: WHICH GRAPH?

Ask students why a bar graph is the best type of graph to show the given data. (Answer: Bar graphs compare different amounts.)

EXTENSION: NUMBER OF PETS

The bar graph shows that more homes have dogs than cats. Page T5 states that there are more cats than dogs living in U.S. homes. Ask students how this is possible. (Answer: There are more cats living in “cat homes” than there are dogs living in “dog homes.”)

10-11: TACKLE . . . SOLVING

STRATEGY: DISCUSS STEPS

Ask students to describe what each step in the problem-solving process means. Have them give examples for each step.

EXTENSION: MNEMONICS

Have students use the first letter in each step of the problem-solving process to develop a mnemonic device that will help them remember the steps. For example: UPSL could stand for Usually Pennies Show Lincoln.

14-15: UP AND ART 'EM

STRATEGY: TIP THAT WORKS!

Don't be fooled by misleading

answers. When possible, before working on a multiple-choice problem, cover the answer choices with a sticky note. Then do the work for the problem on scratch paper. After you've completed your work, lift the sticky note to find your answer.

EXTENSION: 1,089 TRICK (FROM QUESTION #4)

- 1) Take any three-digit number, such as 623. The first and third digits cannot be the same.
- 2) Reverse the order and subtract the lesser number from the greater number. $623 - 326 = 297$
- 3) Reverse the digits of the answer and then add the two numbers together. $297 + 792 = 1,089$.

The final answer is always 1,089!

16: EMMA'S ESTIMATION

STRATEGY: WHY ESTIMATE?

Explain to students that estimation is making a reasonable judgment when an exact answer isn't needed. Estimation also allows us to judge the accuracy of exact answers. Emphasize that there is more than one correct way to estimate. This article presents one method of estimation.

EXTENSION: BONUS QUESTION

Emma's birthday is April 15. Emma is currently 20 years old. In what year was she born? (Answer: 1990)

—Dale Beltzner

Mr. Beltzner is the K-6 Math Subject Area Leader for the Southern Lehigh School District, Center Valley, PA.

Expanded Numbers

We won't stretch the facts when we tell you about numbers in **expanded form**! Numbers in expanded form show the value of each digit in the number. Explore some big world records by writing numbers in expanded form!

What to Do

Read each number below. Then write each number in expanded form.

- ✓ Write each digit times the value of its place.
- ✓ Group each part with parentheses.
- ✓ Write an addition sign between each group.

Example: $63,712 = (6 \times 10,000) + (3 \times 1,000) + (7 \times 100) + (1 \times 10) + (2 \times 1)$

1. Grab the ketchup! The largest burger you can buy at a restaurant weighs 186 pounds. Write 186 in expanded form.

2. Grab the mustard and some relish! The world's longest hot dog was almost 197 feet long! Write 197 in expanded form.

3. Heavy. Kevin Fast set a world record for pulling a truck that weighed 126,200 pounds. Write 126,200 in expanded form.



4. What a ride! The world's longest roller coaster, Japan's Steel Dragon 2000, is 8,133 feet long. Write 8,133 in expanded form.

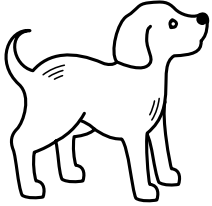
5. Let's go to the beach! The largest beach ball had a volume of 36,882 cubic feet. Write 36,882 in expanded form.

6. Round and round! The record for most people Hula Hooping at once is 1,386 people! Write 1,386 in expanded form.

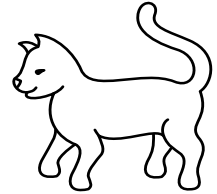
SUPERMATH

Yum! The longest chocolate bar was almost four hundred fifty-six inches long. Write that number in expanded form.

Our Popular Friends



There are more than 77 million dogs and 93 million cats living in U.S. homes! That's a lot of pet food! Having a pet can be lots of fun. But don't forget: Always treat your pets with kindness and take good care of them!



What to Do

Use the bar graph on pages 8 and 9 to learn more about our most popular friends!

1. What two types of pets are owned by an equal number of households?

2. List the names of the types of pets on the graph in order from the greatest number of households owning them to the least number of households.

3. About how many more households have dogs than have cats?

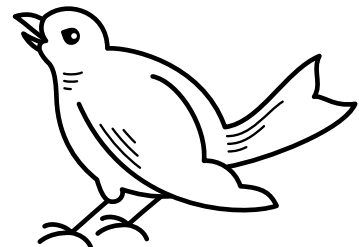
4. Look at the number of households that own fish. Which pet is in about half as many households as that?

5. What type of pet is owned by about 9 times as many households as reptiles?

6. There are 10 times as many households with cats as with what other animal?

SUPERMATH

If you added the number of households owning each type of pet, would the sum show the total number of households in the United States that have pets? Why or why not?





WARM-UP ACTIVITY

Name _____

Problem Solved Prep Page

FOUR-STEP PROBLEM-SOLVING PROCESS

Before you **tackle problem solving** on pages 10 and 11, read our helpful hints to make problem solving no problem at all!

THE FOUR STEPS:

1. Understand: Read the problem carefully. What do you know? What do you need to find out?

What to do:

- ✓ Circle the question—what do you need to solve?
- ✓ Underline or highlight the facts you already know.

Example: Kim had 5 times as many pencils as Andrew. Andrew had 4 pencils.
 (How many pencils did Kim have?)

2. Plan: How will you find the solution? Choose a plan that seems right.

What to do: Choose one of these strategies (or another strategy):

- ✓ Make a drawing.
- ✓ Make a chart or table.
- ✓ Make a list.

Example:

Andrew's pencils: IIII

Kim had 5 times as many as Andrew.

Kim's pencils: IIII IIII IIII IIII IIII

3. Solve: Write an equation to find the solution. Sometimes a problem requires more than one step to find the solution.

What to do:

Add, subtract, multiply, or divide.

Example: Here, multiply: $4 \times 5 = 20$.

4. Look Back: Does your answer make sense?

What to do:

- ✓ Use estimation skills to see if your solution is reasonable.
- ✓ Double-check any calculations.
- ✓ Be sure to label your solution.

Example: Solution—**Kim has 20 pencils.** That seems reasonable because she had more pencils than Andrew. Andrew had 4 pencils. So a solution of less than 4 wouldn't have made sense. And a solution of 100 or more seems way too much. Therefore, 20 pencils is a reasonable solution.

ANSWER BANK (For student edition answers, turn to page T8.)

PAGE T3: PROBLEM OF THE DAY

- DAY 1:** 45 **DAY 19:** 22, 29
DAY 2: true **DAY 20:** 104 hours
DAY 3: 14 miles
DAY 4: 24 times
DAY 5: \$15
DAY 6: 50 zerfs
DAY 7: 9 two-digit nos. (10 if you count 09)
DAY 8: 222
DAY 9: 3 chickens and 3 cats
DAY 10: 8 triangles
DAY 11: 1:40 p.m.
DAY 12: \$14.49
DAY 13: 31, 31 (The pattern shows the numbers of days in each month of the year, starting with January.)
DAY 14: 4
DAY 15: 5 Mondays
DAY 16: 3 and 5
DAY 17: The cone does not belong; it is a 3-D shape. The others are 2-D.
DAY 18: 2 quarters and 2 nickels

PAGE T4: EXPANDED NUMBERS

- $(1 \times 100) + (8 \times 10) + (6 \times 1)$
 - $(1 \times 100) + (9 \times 10) + (7 \times 1)$
 - $(1 \times 100,000) + (2 \times 10,000) + (6 \times 1,000) + (2 \times 100)$
 - $(8 \times 1,000) + (1 \times 100) + (3 \times 10) + (3 \times 1)$
 - $(3 \times 10,000) + (6 \times 1,000) + (8 \times 100) + (8 \times 10) + (2 \times 1)$
 - $(1 \times 1,000) + (3 \times 100) + (8 \times 10) + (6 \times 1)$
- SUPERMATH:** $(4 \times 100) + (5 \times 10) + (6 \times 1)$

PAGE T5: OUR POPULAR FRIENDS

- Reptile and Small Animal
 - Dog, Cat, Fish, Bird, Reptile/Small Animal, Horse
 - about 8,000,000 more households
 - Bird
 - Dog
 - Horse
- SUPERMATH:** No. Some pet-owning homes have more than one type of pet. Also, not every type of pet is covered by the graph.

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ANSWER BANK

(For Teacher's Edition answers, turn to page T7.)

COVER: TIME FOR A CATNAP!

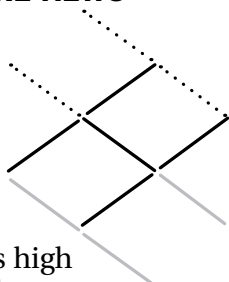
Pawl will get up at 2:15.

Bonus: Fleasha starts her nap at 1:50.

PAGES 2-3: NUMBERS IN THE NEWS

Welcome to DynaMath:

One of several solutions is shown. Dotted lines show the segments' original positions, and gray lines show to where they were moved.



Our Wacky World: 168 inches high

Bonus: 14 feet high

My Little Horsey: 14 inches tall

Fantastic Flight: 250,000 miles

PAGES 4-5: FAIRY TALE DEPOT

1. \$1.50
2. \$5.75
3. \$15.79
4. \$1.87
5. \$7.05
6. \$4.77

SUPERMATH: \$50.86

PAGES 6-7: WILD WORLD RECORDS

1. one hundred eighty-six
2. thirty-six thousand, eight hundred eighty-two
3. one hundred twenty-six thousand, two hundred
4. five hundred thousand
5. thirteen million

SUPERMATH: 290,099 pounds more

PAGES 8-9: POPULAR PETS

1. C
2. Dog
3. Bird
4. about 38,000,000 homes (please accept reasonable estimates)
5. Reptile, Small Animal, and Horse

SUPERMATH: C

PAGES 10-11: TACKLE PROBLEM SOLVING

1c. 25 times

2a. We know the Stumblers scored 21 points for themselves and 35 points for the Grunts. We need to know the difference between the two numbers.

2b. subtraction

2c. 35 points - 21 points = 14 points

3. Touchdown Hound ate a total of 52 treats.

4. Sue spent \$35 on dolls.

SUPERMATH: Lou has to buy 29 helmets.

PAGES 12-13: PATROL TIME

1. 9:00 a.m.

2. 4:00 p.m.

3. on patrol in Golden Gate Park

4. Matt changed into his police uniform

5. 45 minutes

6. 10 hours after

SUPERMATH: 1 hour, 15 minutes (75 minutes) longer

PAGES 14-15: UP AND ART 'EM

1. B

2. C

3. B

4. A

5. D

6. A

7. Swimming

8. Amusement Parks

9. \$1.75

10. ninety thousand, seven hundred ten

PAGE 16: EMMA'S ESTIMATION

1. A

2. B

3. B

4. B

5. A

6. B



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SCHOLASTIC DYNAMATH® TEACHER'S EDITION • VOLUME 29, NO. 1 • September 2010

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POSTAL INFORMATION: SCHOLASTIC DYNAMATH® MAGAZINE (ISSN 0732-7773; in Canada, 2-c no. 8201) is published 8 times during the school year; monthly September, October, January, February, March, and April, bimonthly November/December and May/June by Scholastic Corp., P.O. Box 3710, 2931 East McCarty St., Jefferson City, MO 65102-3710. Periodical postage paid at Jefferson City, MO 65102 and at additional offices. **POSTMASTERS:** Send notice of address changes to SCHOLASTIC DYNAMATH, 2931 East McCarty St., P.O. Box 3710, Jefferson City, MO 65102-3710. **PUBLISHING INFORMATION:** U.S. prices: \$6.99 each per year for 10 or more subscriptions to the same address. 1-9 subscriptions, each: \$19.95 student, \$25.95 Teacher's Edition, per school year. Single copy: \$5.00 student, \$6.00 teacher. (For Canadian pricing, write our Canadian office, address provided below.) Communications relating to subscriptions should be addressed to SCHOLASTIC DYNAMATH MAGAZINE, P.O. Box 3710, 2931 East McCarty Street, Jefferson City, MO 65102-3710 or call toll-free: 1-800-SCHOLASTIC; or go online to www.scholastic.com/custsupport. Communications relating to editorial matters should be addressed to Matt Friedman, SCHOLASTIC DYNAMATH MAGAZINE, 557 Broadway, New York, NY 10012-3999. E-mail address: dynamath@scholastic.com. Canadian address: Scholastic Canada Ltd., 175 Hillmount Rd., Markham, ON L6C 1Z7. Copyright © 2010 by Scholastic Corp. All Rights Reserved. **Material in this issue may not be reproduced in whole or in part in any form or format without special permission from the publisher.** Original contributions to Scholastic DynaMath magazine or to contests, projects and special features sponsored by Scholastic DynaMath magazine become the property of Scholastic Inc. Contributions may not be acknowledged and cannot be returned. To order DynaMath, call 1-800-SCHOLASTIC. Printed in the U.S.A.

