

SCHOLASTIC

# MATH

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TEACHER'S GUIDE  
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ISSUE DATES	9/1	9/15	10/6	10/27	11/17	12/8	1/12	2/2	3/2	3/23	4/13	5/4
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Registration is now required for access to your online resources.

[www.scholastic.com/math](http://www.scholastic.com/math) YOUR ACCESS CODE: **numerator**

Dear Teacher,

Happy New Year! Our first issue of 2015 is filled with exciting, real-world applications to get your students back into the math mindset. Readers will explore a unique angle on Ebola, using exponents and the virus's basic reproduction number to figure out just how contagious it is. They'll calculate the slopes of some super-steep ski trails with rate of change. And they'll use percents to uncover amazing facts about hibernation adaptations—like the percent by which a wood frog can lower its body temperature to survive an Arctic winter!

Remember to register online for access to additional resources, like skills sheets, videos, and games, using the access code: **numerator**.

Best wishes, The Editors  
[mathmag@scholastic.com](mailto:mathmag@scholastic.com)



## SKILLS GUIDE

PAGE	SKILL & ARTICLE TITLE	COMMON CORE STATE STANDARDS	ONLINE RESOURCES <a href="http://www.scholastic.com/math">www.scholastic.com/math</a>
4	<b>Exponents</b> HOW CONTAGIOUS IS EBOLA?	<b>Expressions &amp; Equations:</b> Evaluate expressions that arise from formulas used in real-world problems, including those involving whole-number exponents, at specific values of their variables.	<ul style="list-style-type: none"> <li>Download a differentiated Common Core skills sheet, plus 5 More Questions.</li> <li>Watch an instructional video and a background video.</li> </ul>
6	<b>Slope</b> HIT THE SLOPES!	<b>Functions:</b> Determine the rate of change of a function, and interpret the rate of change in terms of the situation it models.	<ul style="list-style-type: none"> <li>Download a differentiated Common Core skills sheet, plus 5 More Questions.</li> <li>Learn more with Web links.</li> </ul>
8	<b>Percents</b> HOW ANIMALS HIBERNATE	<b>Ratios &amp; Proportional Relationships:</b> Find a percent of a quantity as a rate per 100.	<ul style="list-style-type: none"> <li>Download a differentiated Common Core skills sheet, plus 5 More Questions.</li> <li>Watch a background video.</li> </ul>
12	<b>Statistics</b> RISE OF THE SMARTPHONE	<b>Statistics &amp; Probability:</b> Summarize numerical data sets in relation to their context.	<ul style="list-style-type: none"> <li>Learn more with Web links.</li> </ul>
14	<b>Financial Literacy</b> CRONUT CRAZY	<b>Ratios &amp; Proportional Relationships:</b> Use proportional relationships to solve multistep ratio and percent problems, such as those involving markups and markdowns.	<ul style="list-style-type: none"> <li>Download a differentiated Common Core skills sheet, plus 5 More Questions.</li> <li>Watch a background video.</li> </ul>
16	<b>Square Roots</b> YEAR OF THE VAMPS	<b>Expressions &amp; Equations:</b> Evaluate square roots of perfect squares.	<ul style="list-style-type: none"> <li>Play a game.</li> </ul>

## PAGE 4 • Exponents

### HOW CONTAGIOUS IS EBOLA?




#### STANDARD

Apply and extend previous understandings of arithmetic to algebraic expressions.

#### OBJECTIVE

Use exponents to determine the number of viral infections that may spread.

#### LESSON

- 1 In this article, students will learn about the contagiousness of the Ebola virus. You may want to open with an overview of the current epidemic.
- 2  At [www.scholastic.com/math](http://www.scholastic.com/math), open your digital issue to page 4. Enlarge the map and point out the West African nations of Guinea, Liberia, and Sierra Leone, the countries most affected by the current outbreak. Read the first three paragraphs aloud, and then have students finish the article silently.
- 3 Ask students: What is  $R_0$ ? ( $R_0$  is a measurement used to determine how contagious a virus is.) Is it an exact measurement? (No, there are many factors that can affect the spread of a virus.)
- 4  Enlarge the “Exponents” box on page 5 and read the intro aloud. Make sure that students understand the concept of a wave of cases (i.e., patient zero represents the first wave; cases transmitted by that patient represent the second wave; etc.). Walk through the example.
- 5  Click the video button to watch an instructional video on exponents. Have students work in pairs to answer the questions.

#### S.T.E.M. CONNECTION

- Assign students another infectious disease to research. Have them find the disease’s  $R_0$  and means of transmission. Is the chosen disease more or less contagious than Ebola?

#### ONLINE RESOURCES

- Visit [www.scholastic.com/math](http://www.scholastic.com/math) to download a differentiated Common Core reproducible plus five more exponent questions, and to watch an instructional video on exponents and a background video about the fight against Ebola.

## PAGE 6 • Slope

### HIT THE SLOPES!



#### STANDARD

Use functions to model relationships between quantities.

#### OBJECTIVE

Identify the rates of change of ski trails and convert the rates into percentages.

#### LESSON

- 1 Go to [www.scholastic.com/math](http://www.scholastic.com/math) and open your digital issue to page 6. Ask students to raise their hands if they have ever been skiing or snowboarding. What was the experience like? Did they try any steep trails? Call on volunteers to read the article one paragraph at a time.
- 2  Enlarge the “Calculating Slope” box on page 7 and read the first paragraph aloud. Ask students: What is the rise of a ski trail? (*the height of the trail from top to bottom*) What is the run? (*the length of the trail from beginning to end*)
- 3  For additional review, click the blue Web links button to watch a video that demonstrates how to calculate the slope of a flight of stairs.
- 4 Have students work through the questions on page 7 individually. Review the answers as a class, walking through each step of the calculation if necessary.

#### S.T.E.M. CONNECTION

- Ski slopes and stairways aren’t the only inclined planes whose slopes can be measured! Challenge students to calculate the slopes of any inclined planes that they find around their school, like ramps or door stops.

#### ONLINE RESOURCES

- Visit [www.scholastic.com/math](http://www.scholastic.com/math) to download a differentiated Common Core reproducible, plus five more rate of change questions.
- Watch a video about finding the slope of a stairway at: [www.pbslearningmedia.org/resource/mgbh.math.ee.slope/stairway-slope](http://www.pbslearningmedia.org/resource/mgbh.math.ee.slope/stairway-slope).

PAGE 8 • Percents

## HOW ANIMALS HIBERNATE


### STANDARD


Understand ratio concepts and use ratio reasoning to solve problems.

### OBJECTIVE

Use percents to calculate the change in breathing rate, heart rate, and weight of animals during hibernation.

### LESSON

**1**  Go to [www.scholastic.com/math](http://www.scholastic.com/math) and open your digital issue to page 8. Ask students to take a minute to review the images, headline, and subheadings. Based on the text and images, what do they think the article will be about? (*hibernation*) Click the video button to watch a brief background video on black bears' hibernation. Then read the article's first three paragraphs aloud. Ask students: What can animals do in the cold winter months to survive? (*Grow a thicker coat of fur, migrate to warmer climates, or hibernate by burrowing underground.*)

**2**  Enlarge the "Percent of a Number" box on page 8 and read the first paragraph aloud. Walk students through the given example. At Step 1, students will need to convert a percent into a decimal. If necessary, pause here to review why 25 percent is equivalent to 0.25. (*A percent is a rate out of 100, which is another way to say it is a fraction with a denominator of 100. You can convert a percent to a decimal the same way you would convert a fraction: by dividing the numerator by the denominator.*) If students need an additional review, click on the blue Web links button to watch a video about percents.

**3** Call on volunteers to read the black bear section on page 9 aloud. Ask students to explain the differences between drastic weight gain in humans and black bears. (*In humans, drastic weight gain is unhealthy and can lead to diabetes. But bears must gain weight quickly every year to*

*prepare for hibernation.*) Why isn't drastic weight gain unhealthy in bears, the way it is in humans? (*Bears have a substance in their fat cells that adjusts how they process sugar.*)

**4** Work through questions 1 and 2 as a class. Have students refer to the "Percent of a Number" box to explain each step of the problems.

**5** Have students read the article's remaining sections in pairs, pausing at the end of each section to answer the related questions together. When they're done, review the answers to the rest of the questions as a class.

### COMMON CORE CRITICAL THINKING

→ Split students into small groups to research a hibernating animal not featured in "How Animals Hibernate." Each group should put together a short article that mirrors those they just read, as well as one or two related percent questions. Groups can then swap their articles to learn about other hibernating animals and practice more percent problems.

### ONLINE RESOURCES

- Visit [www.scholastic.com/math](http://www.scholastic.com/math) to download a differentiated Common Core reproducible, plus five more percent questions.
- Watch a video to review the meaning of percent at: [www.pbslearningmedia.org/resource/mkqed-math-rp-percentsdefined/percents-defined](http://www.pbslearningmedia.org/resource/mkqed-math-rp-percentsdefined/percents-defined).
- Watch a video about black-bear hibernation at: [www.animalplanet.com/tv-shows/animal-planet-presents/videos/natural-world-bear-hibernation.htm](http://www.animalplanet.com/tv-shows/animal-planet-presents/videos/natural-world-bear-hibernation.htm).
- Read about other hibernating animals at: [www.conservationinstitute.org/10-animals-that-hibernate](http://www.conservationinstitute.org/10-animals-that-hibernate).

### DIGITAL ISSUE KEY:



SHOW ALL PAGES



HOME



MASK TOOL



DIGITAL STICKY NOTES



TEXT HIGHLIGHTER



DRAWING TOOL



GAME



POP-UP



VIDEO PLAYER

# LESSON PLANS

PAGE 12 • Statistics

## RISE OF THE SMARTPHONE


### STANDARD

Develop understanding of statistical variability.

### OBJECTIVE

Use data to draw conclusions about the growth of iPhone and other smartphone sales over time.

### LESSON

- 1 Go to [www.scholastic.com/math](http://www.scholastic.com/math) and open your digital issue to page 12. Have students read the article and review the related graphs. When they're done, ask them to connect information they read to the illustrated data: For example, which data feature supports the fact that nearly 74% of the United Arab Emirates population owns a smartphone? (*the map*) Does the map support any other details in the article? (*the percent of the U.S. population that owns a smartphone*)
- 2 Direct students' attention to the circle and bar graphs on page 13. What do they have in common? (*Both involve smartphones and show percents.*) Why might one set of data be displayed in a circle graph and the other in a bar graph? (*The circle graph's sectors describe the same whole and add up to 100%. There is no "whole" in the bar graph; those percentages add up to more than 100%.*)
- 3  Have students answer the questions on page 13 independently. Review the answers as a class. Students should be able to explain which graph(s) they used to find each answer.

### COMMON CORE CRITICAL THINKING

- Stage a debate! Divide your class into two groups. One group will take the position that smartphones are harmful, and the other will take the position that smartphones are helpful. Give students time to do research to support their positions.

### ONLINE RESOURCES

- Review different types of graphs and play a related game at: [www.pbslearningmedia.org/resource/ca12f8cb-4b70-4dc0-a8de-84f40150b913/ca12f8cb-4b70-4dc0-a8de-84f40150b913](http://www.pbslearningmedia.org/resource/ca12f8cb-4b70-4dc0-a8de-84f40150b913/ca12f8cb-4b70-4dc0-a8de-84f40150b913).

PAGE 14 • Financial Literacy

## CRONUT CRAZY



### STANDARD

Analyze proportional relationships and use them to solve real-world and mathematical problems.

### OBJECTIVE

Find the markup and markup percentage that bakeries factor into their prices to make a profit.

### LESSON

- 1 Go to [www.scholastic.com/math](http://www.scholastic.com/math) and open your digital issue to page 14. In this article, students will read about a real-world situation in which markup percentage, a type of percent increase, is used. Before reading, click the blue Web links button to watch a video on percent increase.
- 2 Have students read the article silently. When they're done, ask: Why do you think the Cronut became so popular? (*media buzz, supply versus demand, new take on two classic treats*)
- 3  Enlarge the "Calculating Markups" box on page 15. Read the first paragraph aloud and walk students through the example problem.
- 4  Call on a volunteer to identify the values needed to solve question 1: final price (\$100) and original cost (\$5). Highlight these values, and then explain how to plug them into the percent markup formula. Have students complete the following questions individually.

### COMMON CORE CRITICAL THINKING

- Have students brainstorm ideas for hybrid foods. Ask them to create a compelling ad for the product they devise. Students can present their creations and hold a vote on which hybrid treat is most appealing.

### ONLINE RESOURCES

- Visit [www.scholastic.com/math](http://www.scholastic.com/math) to download a differentiated Common Core reproducible, plus five more percent change questions.
- Watch a video on percent increase at: [http://math.scholastic.com/issues/10\\_06\\_14/videos](http://math.scholastic.com/issues/10_06_14/videos).
- Check out Dominique Ansel's At-Home Cronut recipe at: <http://abcnews.go.com/GMA/recipe/home-cronut-recipe-dominique-ansel-25948902>.

# ISSUE SKILLS REVIEW

For use with the January 12, 2015, issue of Scholastic *MATH* magazine.

FILL IN THE CORRECT ANSWER ON THE LINE.

**1** Ebola has an  $R_0$  of 2. Assuming no preventive measures are taken, how many fourth-wave cases may result? (Remember to use the numbered-wave of cases minus 1 as your exponent.)

---

**2** Influenza has an  $R_0$  of 3. Assuming no preventive measures are taken, will there be more or fewer fourth-wave cases of influenza than Ebola? Explain your reasoning.

---

**3** A sand dune has a rise of 15 feet and a run of 5 feet. What is its slope?

---

**4** A mountain has a trail to its peak, which is 1,800 meters high. The trail starts at an elevation of 1,600 meters and its run is 900 meters long. What is the slope of the trail?

---

**5** A little brown bat can eat 50% of its weight in insects in a single night! If the bat weighs 0.5 ounces, how many ounces of insects can it eat in a night?

---

**6** An Arctic ground squirrel weighs 1,450 grams at the start of hibernation. If it loses 65% of its body mass during hibernation, how much does it weigh when it wakes up in the spring?

---

**7** A waffle-doughnut hybrid costs \$2.20 to make, and it sells for \$2.75. What is its markup?

---

**8** If the same waffle-doughnut hybrid from question 7 sold for \$3.25, what would its markup percentage be? Round your answer to the nearest percent.

---

**9**  $\sqrt{4} =$

---

**10**  $\sqrt{36} =$

---

## Problem of the Day

TRY ONE OF THESE QUICK EXERCISES EACH DAY AS A FAST, FUN WAY TO START YOUR MATH LESSON!

<p><b>DAY 1</b></p> <p>Express the following expression in exponential form:  <math>2 \times 2 \times 2 \times 2 \times 2</math></p>	<p><b>DAY 2</b></p> <p>A steep hill has a slope of <math>\frac{5}{2}</math> and a run of 200 meters. What is its rise?</p>	<p><b>DAY 3</b></p> <p>The National Toy Hall of Fame began inducting toys in 1998. It now includes 56 toys. What has been the average number of inductees per year? Round to the nearest whole number.</p>	<p><b>DAY 4</b></p> <p>What is the least common multiple of the integers 18, 12, and 36?</p>	<p><b>DAY 5</b></p> <p>Solve for <math>x</math>: <math>\frac{8x}{8} = 8</math></p>
<p><b>DAY 6</b></p> <p>The ice sheet above the South Pole shifts at a rate of about 33 feet per year. How many inches does it shift per week? Round your answer to the nearest tenth of an inch.</p>	<p><b>DAY 7</b></p> <p>Solve the following proportion:  <math>\frac{x}{15} = \frac{18}{45}</math></p>	<p><b>DAY 8</b></p> <p><math>-24 \div 6 =</math></p>	<p><b>DAY 9</b></p> <p>The ingredients to bake a pie cost \$5.50. If you sell the pie for \$7.00 at a school fund-raiser, was the markup percentage more or less than 50%?</p>	<p><b>DAY 10</b></p> <p><math>\sqrt{100} + \sqrt{25} =</math></p>
<p><b>DAY 11</b></p> <p>What is 25 percent of 275?</p>	<p><b>DAY 12</b></p> <p>China has about 1.36 billion people, with 47 percent of the population owning a smartphone. About how many people in China do not own a smartphone?</p>	<p><b>DAY 13</b></p> <p>What is the slope of a vertical line?  <b>A.</b> 0  <b>B.</b> 1  <b>C.</b> No slope, or undefined</p>	<p><b>DAY 14</b></p> <p>Find the volume of a cylinder with a radius of 2 inches and a height of 6 inches.</p>	<p><b>DAY 15</b></p> <p>A giant swarm of migrating butterflies stretched 260 miles from end to end. What was the length of the swarm in kilometers? (Hint: There are 1.6 kilometers per mile.)</p>
<p><b>DAY 16</b></p> <p>Use the distributive property to expand the following expression: <math>7(y + 2)</math></p>	<p><b>DAY 17</b></p> <p>What is the median of the following data set?            3, 12, 7, 8, 9, 9, 4</p>	<p><b>DAY 18</b></p> <p><math> -5  - 1 =</math></p>	<p><b>DAY 19</b></p> <p>The predicted number of third-wave cases of the flu virus is represented by <math>3^2</math>. How many third-wave cases are predicted?</p>	<p><b>DAY 20</b></p> <p><math>4 \div 9 =</math></p>

## PAGES 2-3

### NUMBERS IN THE NEWS

#### SOUTH AFRICAN GIANT

120 inches or 10 feet

#### TOP TOYS

5%

#### MOVE OVER, SOUTH POLE!

1.1 inches per day

#### DO THE MATH!

40

## PAGE 4

### HOW CONTAGIOUS IS EBOLA?

1. 4 cases
2. 27 cases
3. 104,976 cases
- 4a. The measles
- 4b. 324 cases
5. 111 cases

## PAGE 6

### HIT THE SLOPES!

- 1a. 5% to 20%
- 1b. 5.6%
2. 8.5%; beginner
3. 14.9%; beginner
4. 24.6%; intermediate
5. 3,218.9 feet

## PAGE 8

### HOW ANIMALS HIBERNATE

1. 14 beats per minute
2. 1 breath per minute
3. 0.3 ounces
4. 6%
5. 975 grams
6. 4 beats per minute
7. 37 weeks
8. 8 grams

## PAGE 12

### RISE OF THE SMARTPHONE

1. B
2. B
3. C
4. C
5. D
6. A
7. 25-34 age group
8. 55.8 million
9. 176,960,000 people
10. Not necessarily; the total number of smartphone owners will be based on the country's total population. So a country with a high percentage of owners and a small population may have fewer total owners than a country with a low percentage of owners out of a much larger population.

## PAGE 14

### CRONUT CRAZY

- 1a. \$0.50
- 1b. 11%
2. 23%
3. 200%
4. Townies
5. \$1.87

## BACK PAGE

### YEAR OF THE VAMPS

1. A
2. A
3. A
4. B
5. A

*To find the answers online, click on "Teaching Resources."*

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- **MATH GAMES**

# ANSWERS

## TG PAGE 5

### SKILLS REVIEW

1. 8 cases
2. More;  $3^3 > 2^3$
3.  $\frac{3}{1}$
4.  $\frac{2}{9}$
5. 0.25 ounces
6. 507.5 grams
7. \$0.55
8. 48%
9. 2
10. 6

## TG PAGE 6

### PROBLEM OF THE DAY

1.  $2^6$
2. 500 meters
3. 3 toys per year
4. 36
5.  $x = 8$
6. 7.6 inches per week
7.  $x = 6$
8. -4
9. Less

10. 15
11. 68.75
12. 720,800,000 people
13. C
14. 169.56 inches
15. 416 kilometers
16.  $7y + 14$
17. 8
18. 4
19. 9
20.  $0.\overline{4}$

## DATA ANALYSIS FOR GRADES 7-8. SCHOLASTIC.COM/UNEXPECTEDMATH

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