# There's
# **Power**
# In Numbers

stjude.org/math

St. Jude patient
**Lila**

St. Jude Children's® Research Hospital

**St. Jude**
Math-A-Thon

# Welcome to The St. Jude Math-A-Thon®!

Thank you for supporting St. Jude Children's Research Hospital®. Because of fundraising programs like St. Jude Math-A-Thon and supporters like you, St. Jude is leading the way the world understands, treats and defeats childhood cancer and other life-threatening diseases. You're an important part of making this fundraiser a success, and participation is easy:

**1** Raise money online using the tools available at **stjude.org/math**

**2** Complete the math worksheets in this workbook

**3** Earn cool prizes!

St. Jude patient
**Lila**

# Meet Lila

In 2019, Lila turned 11 in the bone marrow transplant unit of St. Jude Children's Research Hospital®, after receiving the transplant that aimed to save her life. She had completed treatment for acute myeloid leukemia at another hospital, but after six months in remission, the cancer came back. This time, Lila's family sought a referral to St. Jude. Lila received her mother's cells in a haploidentical transplant, a procedure pioneered by St. Jude. Today, Lila remains in remission. When all this is behind her, she hopes to pursue a career in pediatric oncology "and maybe, in my wildest dreams, work at St. Jude."

# How Math Helps St. Jude

Math is used every day on the St. Jude campus. From careful measurements for patient medicine to the complex mathematics needed in our state-of-the-art research facilities, numbers play an important role in helping our patients. As you complete each worksheet, know that you're sharpening important skills that are used every day to help the kids of St. Jude.



- Since opening, St. Jude has helped push the overall cancer survival rate from 20% to more than 80%. Using your math skills, you notice that means St. Jude is 20% away from totally beating cancer. We won't stop until no child dies from cancer!

- More than 75% of our operating costs come from generous donors. That means more than half of our needs are met thanks to people like you and your family—thank you!

- Most of our patients are treated as outpatients and stay in one of our three housing facilities. We use math to keep track of our nearly 300 rooms specifically designed and managed by us for families of children with cancer and other diseases.

# Ready to Sign Up?

St. Jude relies on the power in numbers. Math plays a vital role in nearly every aspect of our campus, but the strength in numbers is never more powerful than when it helps our patients. That's where you come in—turn to the back page of your funbook to start the sign up process. You can even have your parents scan the QR code and sign up online.

St. Jude patient
**Smyrna**

# MEET THE NUMERATORS

My name is Dr. Jax. Not long ago, four ordinary students discovered they had extraordinary mathematical abilities. Under my guidance, they learned to harness their skills into incredible powers—powers that can be used to help those less fortunate than themselves. Armed with super powers, these once ordinary students became...
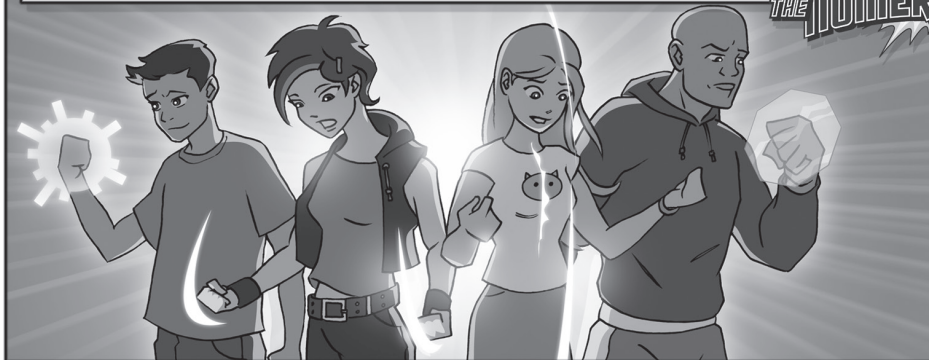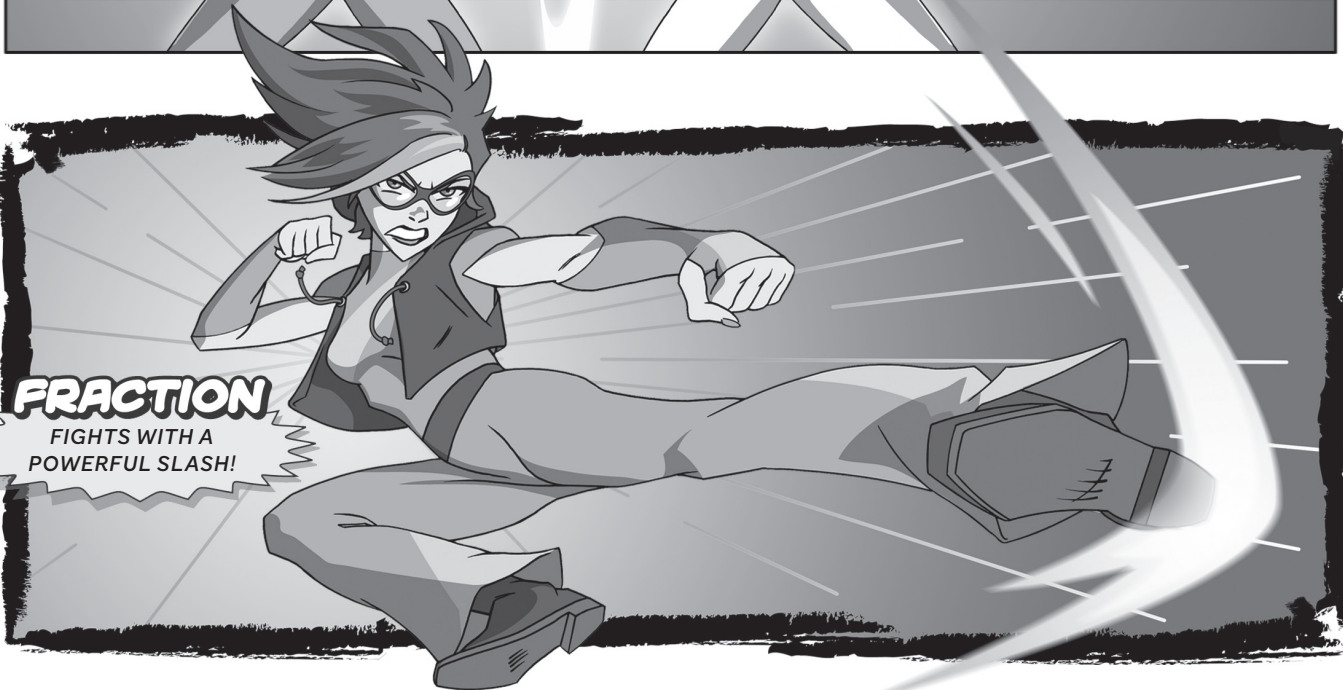
THE NUMERATORS
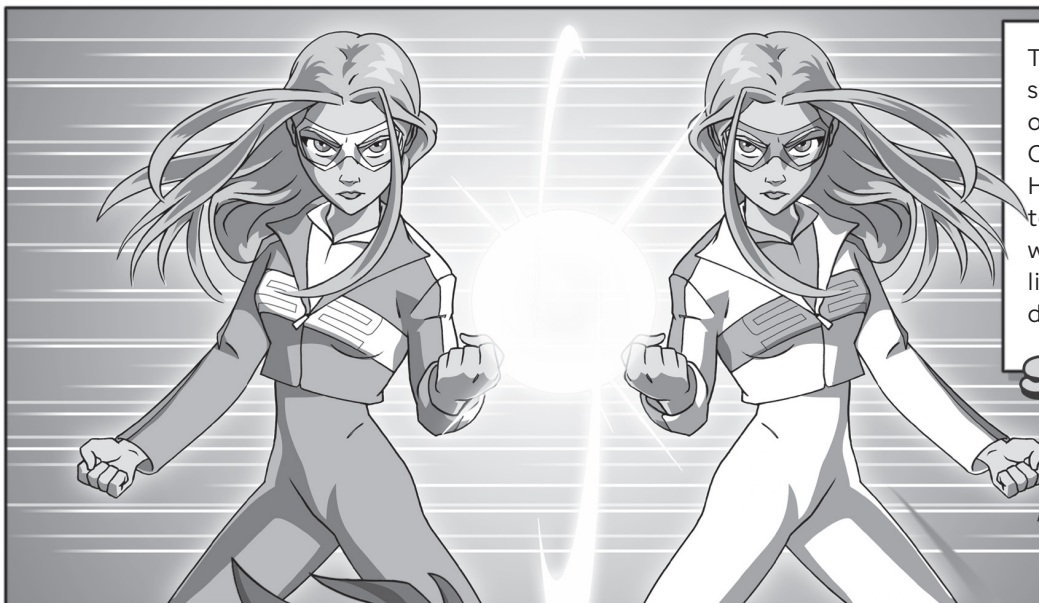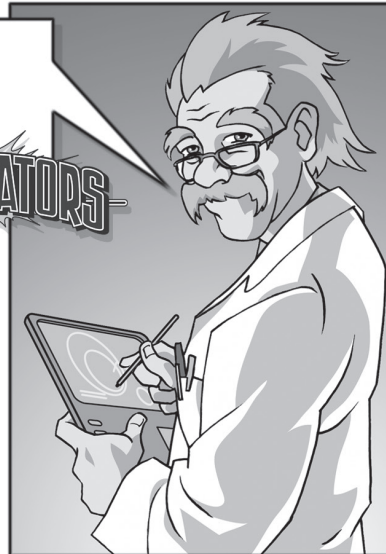
They used their math skills for the good of others, helping St. Jude Children's Research Hospital® raise money to find cures for children with cancer and other life-threatening diseases.
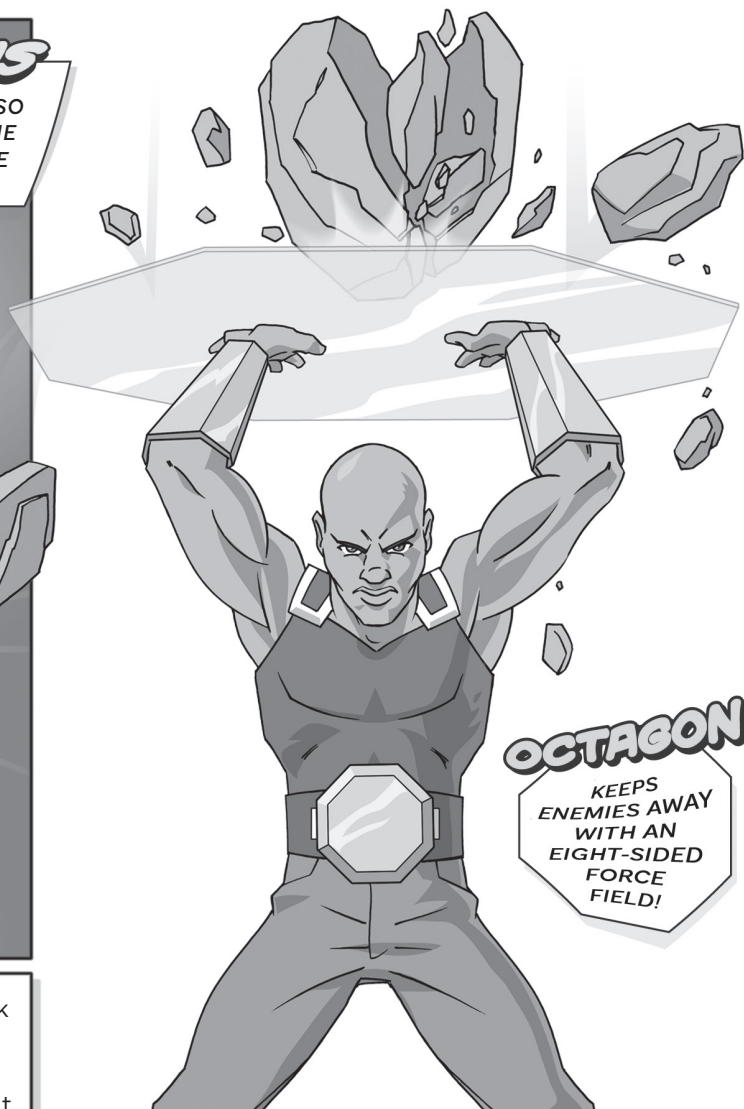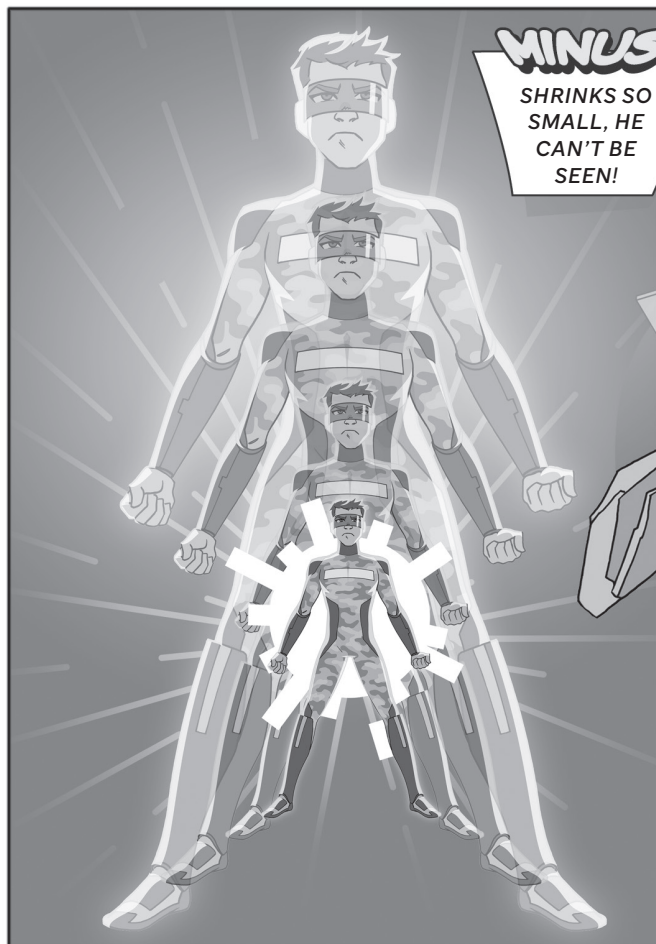
**SYMMETRY**

*SPLITS INTO EQUAL PARTS FOR A DOUBLE ATTACK!*

**FRACTION**

*FIGHTS WITH A POWERFUL SLASH!*

**MINUS**

*SHRINKS SO SMALL, HE CAN'T BE SEEN!*

**OCTAGON**

*KEEPS ENEMIES AWAY WITH AN EIGHT-SIDED FORCE FIELD!*
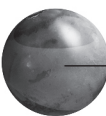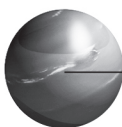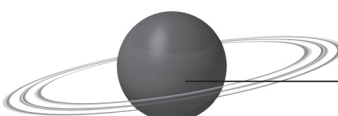
But, nothing prepared them for a surprise attack by armored droids sent from the future. These robots want to use The Numerators' powers for their own purposes. Until The Numerators defeat their attackers, they can't continue their work to help St. Jude.
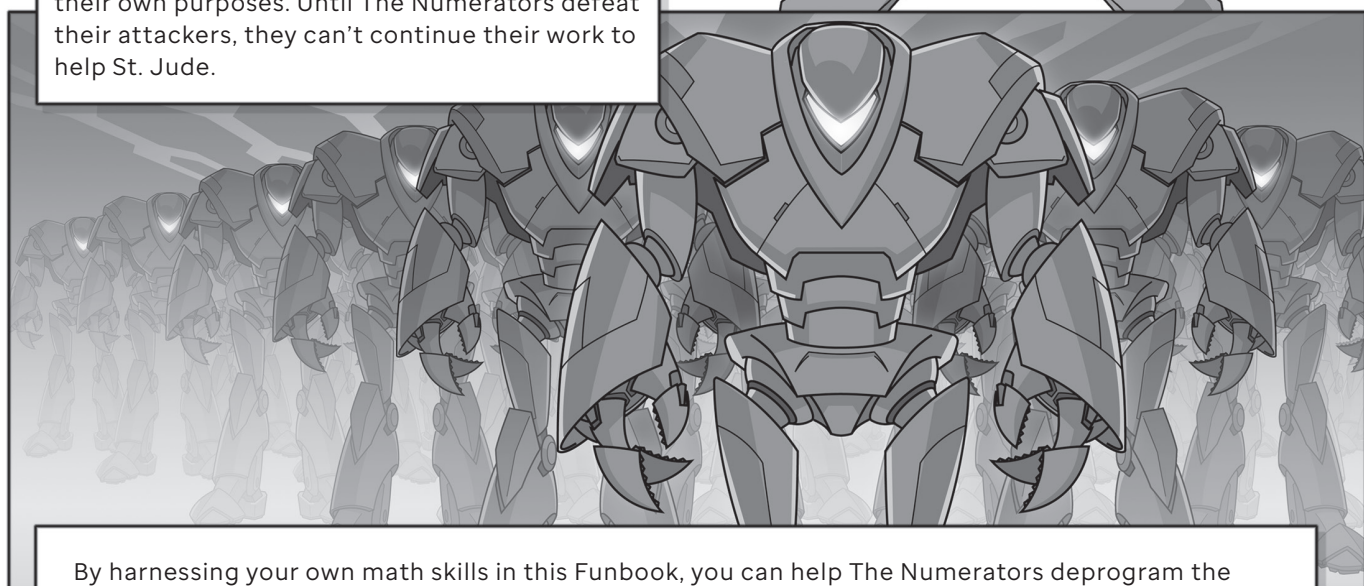
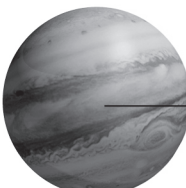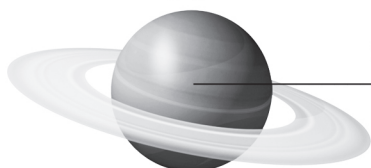By harnessing your own math skills in this Funbook, you can help The Numerators deprogram the robots. By participating in the St. Jude Math-A-Thon, you'll raise money to help kids at St. Jude. Just like The Numerators, you can use math to help fund research and find cures for kids. Help The Numerators while helping St. Jude, and begin your own adventure today!

4

# Decimals in Space!

The Numerators have teleported themselves—and several Earth objects—to other planets to test their strength! This chart shows the factor to multiply by an object's weight on Earth to find what its weight would be on each planet. See how strong they are here—and throughout the solar system!

| Planet: | Multiply Earth weight by... |
|---------|:---------------------------:|
| Mercury | .38 |
| Venus | .91 |
| Earth's moon | .17 |
| Mars | .38 |
| Jupiter | 2.36 |
| Saturn | 1.06 |
| Uranus | .89 |
| Neptune | 1.13 |

1. On Mercury, Symmetry lifts a boulder that weighs 500 pounds on Earth. What is its weight on Mercury?

   _____

2. Fraction goes to Saturn and picks up a bathtub that weighs 200 pounds on Earth. How much does it weigh on Saturn?

   _____

3. Octagon brought a barbell with 1,200 pounds of weight on it to the Earth's moon. How much does it weigh there?

   _____

4. On Jupiter, Minus tries to lift a park bench that weighs 74 pounds on Earth. How much does it weigh on Jupiter?

   _____

5. A car's Earth weight: 2,850 pounds. Weight on Venus:

   _____

6. School backpack's Earth weight: 15 pounds. Weight on Uranus:

   _____

7. Refrigerator's Earth weight: 250 pounds. Weight on Mars:

   _____

8. Minus' weight on Earth when he shrinks to his smallest size: .65 pounds. Equivalent weight on Neptune:

   _____

9. Video game system's Earth weight: 3.84 pounds. Weight on Jupiter:

   _____

10. Flat-screen TV's weight on Venus: 136.5 pounds. Weight on Earth:

   _____

# High-Speed Chases

The Fleet Feet gang is on the run at super speed! Calculate how far, for how long or how fast The Numerators have to go to keep up with each criminal.
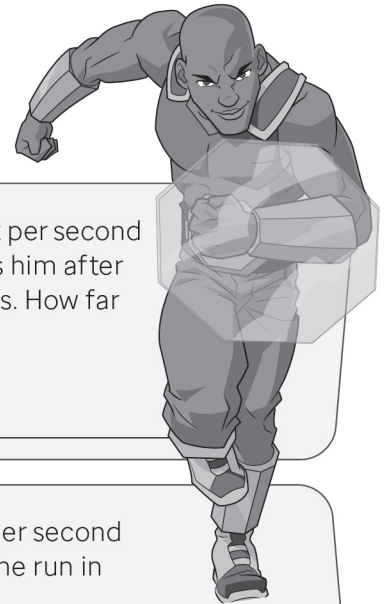
1. Kid Quick moves 75 feet per second (51 mph). Fraction stops him after he runs for 15 seconds. How many feet did Kid Quick run?

_____

2. Fast Eddy moves 49 feet per second (33 mph). Minus catches him after Eddy runs for 25 seconds. How far had Fast Eddy run?

_____

3. The Speed Demon runs 88 feet per second (60 mph). How far can he run in 39 seconds?

_____

4. She-Blurr runs 96 feet per second (65 mph). How far can she run in 52 seconds?

_____

5. Windy Wendy runs 72 feet per second (49 mph). How many seconds does it take her to run 2,664 feet?

_____

6. Sprinter runs 59 feet per second (40 mph). How long does it take him to run 826 feet?

_____

7. Impossa-Bill runs 91.8 feet per second (63 mph). How long does it take him to run 5,783.4 feet?

_____

8. The Mad Dasher runs 3,483 feet in 43 seconds. How many feet per second is that?

_____

9. Juana Race runs 4,890.05 feet in 52.3 seconds. How many feet per second is that?

_____

10. The Fastest runs 2,464 feet in 22.4 seconds. How many miles per hour is that?

_____

# Reboot the Robot

A giant robot has attacked The Numerators! But a secret code phrase will deactivate it. While The Numerators battle the 'bot, they need you to find the secret phrase. Solve each fraction division problem and write your answers in simplest form. After you solve all the problems, you'll find some of your answers beneath the blanks below. Write the letter that is next to each answer in the blank above the correct fraction.

**1.** $1/3 \div 1/6 =$ _____ = E

**2.** $5 \div 1/5 =$ _____ = T

**3.** $1/4 \div 3/4 =$ _____ = A

**4.** $5/8 \div 1/4 =$ _____ = P

**5.** $2 \div 2/5 =$ _____ = S

**6.** $6 \div 2\,1/3 =$ _____ = D

**7.** $2/7 \div 3/10 =$ _____ = O

**8.** $5 \div 5\,2/3 =$ _____ = L

**9.** $5\,1/6 \div 3\,1/3 =$ _____ = N

**10.** $1\,7/8 \div 3\,1/2 =$ _____ = Y

### What is the secret phrase that will shut down the robot?

____ ____ ____ ____ ____ ____ ____ ____!
2 1/2  15/17  1/3  15/28   2 4/7   2   1/3  2 4/7

7

# Fraction vs. Mal Function

Look out, Fraction—it's Mal Function! Fill in the missing values in each function table and write an equation that shows the rule for each one. Otherwise, Mal Function will attack Fraction with a table! (We gave you the rule for the first one at the top of the table.)

**1.**

| x | y = 4x – 1 |
|---|---|
| 1 | 3 |
| 2 | 7 |
| 3 | ___ |
| 4 | ___ |
| 5 | ___ |
| 6 | ___ |
| 7 | ___ |

**2.**

| x | y |
|---|---|
| 0 | 0 |
| 1 | 5 |
| 2 | 10 |
| 3 | 15 |
| 4 | ___ |
| 5 | ___ |
| 6 | ___ |

Rule: y = _____

**3.**

| x | y |
|---|---|
| 0 | 3 |
| 1 | 5 |
| 2 | 7 |
| 3 | ___ |
| 4 | ___ |
| 5 | ___ |
| 8 | ___ |

Rule: y = _____

**4.**

| x | y |
|---|---|
| 0 | 18 |
| 1 | 21 |
| 2 | 24 |
| 3 | ___ |
| 6 | ___ |
| 11 | ___ |
| 25 | ___ |

Rule: y = _____

Good work!
Way to think fast!

8

# X's and O's

X-tra! X-tra! Read all about it! The Variable Villains have promised to give up crime if The Numerators can pick the perfect loving pet for each villain. Evaluate each expression, then draw a line between each villain and the pet with the matching value. You can be a hero!

**1.** Blue j:
$27 + j$, for $j = 56$

**2.** n-Emmy:
$n - 38$, for $n = 82$

**3.** r the Pirate:
$r + 15.6$, for $r = 34.5$

**4.** g Whiz:
$3g$, for $g = 7$

**5.** b Bad:
$5b$, for $b = 18$

**6.** d Worst:
$64 \div d$, for $d = 8$

**7.** o No:
$3.4o$, for $o = 8$

**8.** Evil i:
$i/9$, for $i = 135$

**9.** y Me:
$582.3 - y$, for $y = 495.4$

**10.** u Crook:
$5.7u$, for $u = 9$

**11.** v Neck:
$.4v$, for $v = 200.6$

**12.** Cruel t:
$3{,}867.5/t$, for $t = 45.5$

Furball
8

Fleabit
15

Whiskers
21

Fang
27.2

Nibbles
51.3

Gill
44

Killer
50.1

Arfy
80.24

Clawdia
83

Polly
85

Squeaks McGee
86.9

Ruffian
90

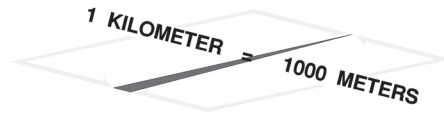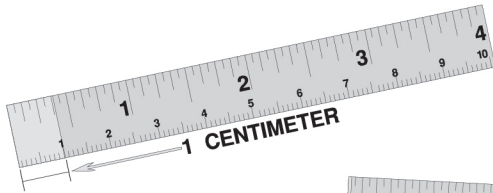# Scavenger Hunt

The sixth graders had a scavenger hunt. But instead of collecting the items on each list, the teams had to find the measurements of the items. Fill in the correct unit for each measurement. Use MM, CM, M or KM.

## Team A

| | | |
|---|---|---|
| The length of a roller skate | 17 | _____ |
| The height of a maple tree | 18 | _____ |
| The length of a garden hose | 8 | _____ |
| The distance from the top of a waste basket to the bottom | 31 | _____ |
| The length of a piece of macaroni | 30 | _____ |
| The distance from your school to the library | 1.3 | _____ |
| The distance between your town and the next | 17 | _____ |
| The width of a crosswalk | 2.5 | _____ |
| The length of a stick of gum | 9 | _____ |
| The length of a bird's feather | 110 | _____ |

## Team B

| | | |
|---|---|---|
| The length of a shoelace | 60.8 | _____ |
| The height of a lamppost | 6.4 | _____ |
| The length of your classroom | 10 | _____ |
| The width of your math book | 20 | _____ |
| The distance between your chair and the next | 32 | _____ |
| The thickness of a sandwich | 40 | _____ |
| The height of a basketball hoop | 3.05 | _____ |
| The width of a crayon | 8 | _____ |
| The length of your teacher's hand | 17 | _____ |
| The distance between your town and the state capital | 128 | _____ |

# Answer Key

## Page 5
**Decimals in Space!**
1. 190 pounds
2. 212 pounds
3. 204 pounds
4. 174.64 pounds
5. 2,593.5 pounds
6. 13.35 pounds
7. 95 pounds
8. .7345 pounds
9. 9.0624 pounds
10. 150 pounds

## Page 6
**High-Speed Chases**
1. 1,125 feet
2. 1,225 feet
3. 3,432 feet
4. 4,992 feet
5. 37 seconds
6. 14 seconds
7. 63 seconds
8. 81 feet per second
9. 93.5 feet per second
10. 75 miles per hour

## Page 7
**Reboot the Robot**
1. 2
2. 25
3. 1/3
4. 2 1/2
5. 5
6. 2 4/7
7. 20/21
8. 15/17
9. 1 11/20
10. 15/28
Secret Phrase: PLAY DEAD!

## Page 8
**Fraction vs. Mal Function**

1.

| x | y = 4x – 1 |
|---|---|
| 1 | 3 |
| 2 | 7 |
| 3 | 11 |
| 4 | 15 |
| 5 | 19 |
| 6 | 23 |
| 7 | 27 |

2.

| x | y |
|---|---|
| 0 | 0 |
| 1 | 5 |
| 2 | 10 |
| 3 | 15 |
| 4 | 20 |
| 5 | 25 |
| 6 | 30 |

Rule: y = 5x

3.

| x | y |
|---|---|
| 0 | 3 |
| 1 | 5 |
| 2 | 7 |
| 3 | 9 |
| 4 | 11 |
| 5 | 13 |
| 8 | 19 |

Rule: y = 2x + 3 or –3 + 2x

4.

| x | y |
|---|---|
| 0 | 18 |
| 1 | 21 |
| 2 | 24 |
| 3 | 27 |
| 6 | 36 |
| 11 | 51 |
| 25 | 93 |

Rule: y = 3x + 18 or –18 + 3x

## Page 9
**X's and O's**
1. 83; Clawdia
2. 44; Gill
3. 50.1; Killer
4. 21; Whiskers
5. 90; Ruffian
6. 8; Furball
7. 27.2; Fang
8. 15; Fleabit
9. 86.9; Squeaks McGee
10. 51.3; Nibbles
11. 80.24; Arfy
12. 85; Polly

## Page 10
**Scanvenger Hunt**

| Team A: | Team B: |
|---|---|
| CM | CM |
| M | M |
| M | M |
| CM | CM |
| MM | CM |
| KM | MM |
| KM | M |
| M | MM |
| CM | CM |
| MM | KM |

St. Jude patient
**Michael**

Check out **stjude.org/math** to start fundraising online today!

Packed with tools to help you manage your fundraising efforts, raise more money and save time, **stjude.org/math** includes tools to help you:

+ Find your school
+ Create your own fundraising webpage and set your goal
+ Accept online donations
+ Integrate with Facebook Fundraising

Scan to find your school and sign up!

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Math-A-Thon

**mathathon.org | mathathon@stjude.org | #stjudemathathon | 1-800-386-2665**