

Lesson: Mileage Graph
Grades: 3-4
Skills: Graphing
Time: 20 minutes/extend to daily

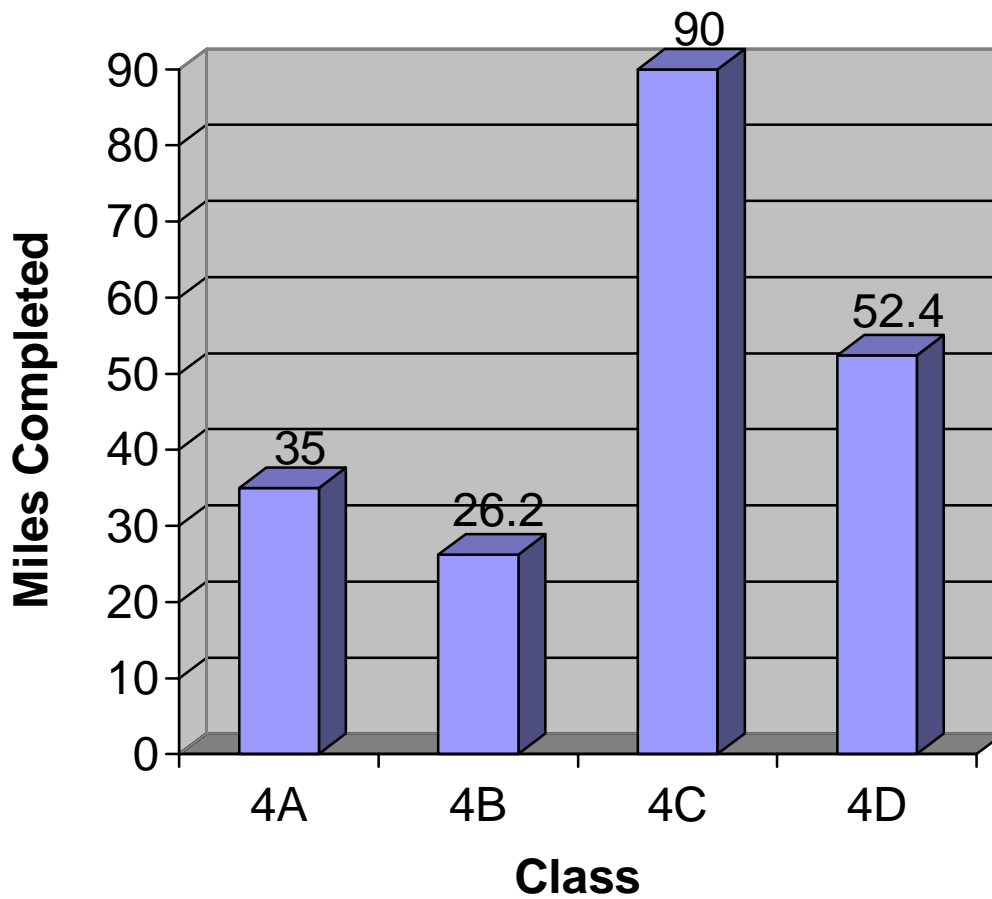
What to do:

Use data from this graph to answer the problems on next page

Follow up:

Create a graph of the school's actual mileage and make this into an ongoing project by generating your own questions.

Total Miles



Lesson: Mileage Graph (continued)

Question 1:

Which class ran twice as far as another class?

→ 4D ran twice as far as 4B

Question 2:

Which two classes could have run exactly 5 miles each time they ran?

→ 4A and 4C have totals that are multiples of 5

Question 3:

If class 4C ran 5 miles each week, how many weeks have they been running?

→ 18

Question 4:

How many miles have the students in class 4A run since they completed their first marathon?

→ 8.8

Question 5:

How many more miles would class 4A have to run to catch up with 4C?

→ 55 miles

Lesson: 26 Digit Place Value

Grades: 3-6

Skills: Place value

Time: 15 minutes

What to do:

In honor of the 26 mile marathon, write this 26 digit number on the board.

10,345,678,743,999,421,975,001,001

Ask students: Can you say this number?

Review place value with students. What comes after the millions place?
Billions, trillions...

Write this list on the board. It is the list of the number families for every three digits through 27 digits.

HUNDREDS	999
THOUSANDS	999,999
MILLIONS	999,999,999
BILLIONS	999,999,999,999
TRILLIONS	999,999,999,999,999
QUADRILLIONS	999,999,999,999,999,999
QUINTILLIONS	999,999,999,999,999,999,999
SEXTILLIONS	999,999,999,999,999,999,999,999
SEPTILLIONS	999,999,999,999,999,999,999,999,999

Challenge students to say the number you wrote on the board.

10,345,678,743,999,421,975,001,001

It should sound like this:

Ten septillion, three hundred forty five sextillion, six hundred seventy eight quintillion, seven hundred forty three quadrillion, nine hundred ninety nine trillion, four hundred twenty one billion, nine hundred seventy five million, one thousand, one

Lesson: Bib Numbers
Grades: 3-4
Skills: Number sense, problem solving
Time: 20 minutes

What to do:

Review the following terms before the activity:

Even/odd numbers

Multiples

Distribute the Bib Number Worksheet on the following page and instruct the students to try to solve the bib number problems for the five runners.

→ Jenna - 870
Jake - 475
Jackie - 757
Joe - 861
Jim - 679

Name: _____

Bib Number Worksheet

Mighty Milers	Mighty Milers	Mighty Milers	Mighty Milers	Mighty Milers
870	861	475	757	679
Fun Run	Fun Run	Fun Run	Fun Run	Fun Run

Five runners were looking for their bib numbers.

Jake said, my number is a multiple of 5

Jackie said, my number is 53 less than 810

Joe said, I am an odd number whose digit sum is 15

Jenna said, my number is the greatest number

Jim said, 1000 is 321 more than my number

Which number belongs to each runner?

Jenna	Jake	Jackie	Joe	Jim

Lesson: Bill Rodgers Fill-in
Grades: 3-4
Skills: Literacy, number sense
Time: 25 minutes

What to do:

Distribute the worksheet on the following page. After reading the entire passage out loud with the students, work with them on filling in the blank spaces with the numbers from the box.

- Discuss that his birth year needs to be the earliest year
- His total number of victories has to equal the sum of two other numbers $4 + 4 = 8$
- Remind students that 15 minutes is the same as $1/4$ hour
- Remind students that elite marathoners usually run the marathon in less than 2 hours and 10 minutes.

Answers:

Bill Rodgers is considered to be one of the greatest American marathon runners of all time. He was born in the year 1947 in Hartford Connecticut. He won the New York City Marathon and the Boston Marathon 4 times each for a total of 8 victories. In the years 1975, 1977, and 1979 he was the top ranked marathon runner in the world. He ran 28 of his 58 marathons in less than 2 hours and 15 minutes, which meant that 30 of his marathons took him longer than 2 and 1/4 hours. The fastest one-mile run he completed was in 4 minutes and 16 seconds. And the fastest marathon he ever ran was 2 hours 9 minutes and 27 seconds.

Name: _____

Bill Rodgers Fill-In Worksheet

Use the numbers in the box below to complete this paragraph so that it makes sense.

Bill Rodgers is considered to be one of the greatest American marathon runners of all time. He was born in the year _____ in Hartford Connecticut. He won the New York City Marathon and the Boston Marathon _____ times each for a total of _____ victories. In the years 1975, 1977, and _____ he was the top ranked marathon runner in the world. He ran 28 of his 58 marathons in less than _____ hours and _____ minutes, which meant that _____ of his marathons took him longer than 2 and _____ hours. The fastest one-mile run he completed was in 4 minutes and 16 seconds. And the fastest marathon he ever ran was _____ hours _____ minutes and _____ seconds.

1/4	30	27
8	2	1947
2	9	4
15	1979	

Lesson: Bill Rodgers Math
Grades: 3-5
Skills: Literacy, problem solving, time
Time: 30 minutes

What to do:

Read the following passage to the students and ask the questions below.

Bill Rodgers is considered to be one of the greatest American marathon runners of all time. He won both the New York City and Boston marathons 4 times each. The best time he ran in Boston was 2:09:27, and his best time in New York was 2:10:10.

Problem 1:

How much faster was his time in Boston than in New York?

→ 43 seconds

Problem 2:

Record marathon times keep getting faster. Today's world's record for the marathon is 2:04:55 (as of 10/2006). How much faster is that than Bill Rodgers fastest Boston marathon?

→ 4 minutes 32 seconds

Challenge:

If Bill Rodgers ran each mile of a marathon in exactly five minutes, what would be his time for a complete 26-mile marathon?

→ $26 \times 5 = 130$ minutes or 2 hours 10 minutes

Lesson: Coin Math
Grades: 3-4
Skills: Money sense
Time: 20 minutes

What to do:

Tell students that the magic number for the marathon is 26 because there are 26 miles to run. Ask students how many ways they can discover to make 26 cents using quarters, dimes, nickels, pennies. How can they keep track?



$$\textcircled{D} + \textcircled{D} + \textcircled{N} + \textcircled{P} = 26$$

Possible Answers:

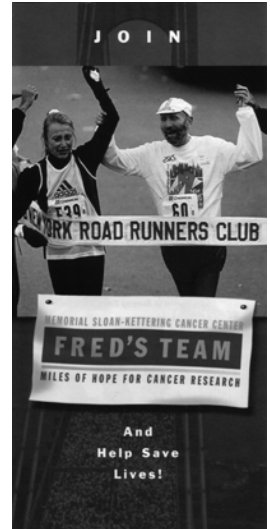
- | | | | |
|----|----|----|-----|
| 0Q | 0D | 0N | 26P |
| 0Q | 0D | 1N | 21P |
| 0Q | 0D | 2N | 16P |
| 0Q | 0D | 3N | 11P |
| 0Q | 0D | 4N | 6P |
| 0Q | 0D | 5N | 1P |
| 0Q | 1D | 0N | 16P |
| 0Q | 1D | 1N | 11P |
| 0Q | 1D | 2N | 6P |
| 0Q | 1D | 3N | 1P |
| 0Q | 2D | 0N | 6P |
| 0Q | 2D | 1N | 1P |
| 1Q | 0D | 0N | 1P |

Lesson: Fred's Team
Grades: 3-4
Skills: Literacy, money, multiplying
Time: 30 minutes

What to do:

Read the boxed text below to students.

Then distribute the worksheet on next page and have the students complete it.



Fred Lebow and
Grete Waitz
finishing the 1992 N.Y.
Marathon

Answers:

Pennies	26¢
Nickels	\$1.30
Dimes	\$2.60
Quarters	\$6.25
Half dollars	\$13
Dollars	\$26

Challenge Answer:

\$29.90

In 1991, Memorial Sloan-Kettering Cancer Center forged a unique partnership with an extraordinary man named Fred Lebow - a running legend and **creator of the New York City Marathon**. While being treated for cancer at Memorial Sloan-Kettering Cancer Center, Fred would take training runs up and down the hospital corridors. Then, in 1992, while sick, he ran the entire New York City Marathon. "Running the marathon is the best way I know to fight this disease," he said. At the end of his life, Fred encouraged runners to get friends and relatives to sponsor their runs to raise money for cancer research. As a result, Fred's Team members have raised more than \$28 million for Pediatric Cancer Research.

Name: _____

Fred's Team Worksheet

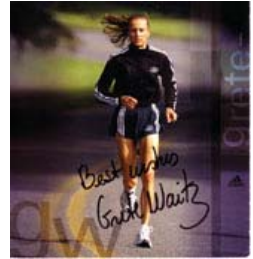
Many people run the New York City Marathon to raise money for charity groups such as Fred's Team. A runner raises money by getting sponsors to donate a certain amount for every mile they run. Can you fill in this chart to find out how much money you would raise if you were sponsored for a penny, nickel, dime, quarter, half-dollar or dollar for each mile of the marathon.

Donation Amount/mile	Value of Coin	Miles Completed	Total Raised
Penny		26	
Nickel		26	
Dime		26	
Quarter		26	
Half-Dollar		26	
Dollar		26	

Challenge:

How much would you earn if you were sponsored for \$1.15 / mile?
(Can you figure it out from your answers on the graph above?)

Lesson: Grete Waitz Math
Grades: 3-4
Skills: Problem solving
Time: 25 minutes



Problem 1:

In 1978, Grete Waitz had never run more than 12 miles at one time, yet she came to New York and went on to win the 26-mile New York City Marathon in 2:32 minutes, a new world's record for women runners. How many more miles did she run that day than she had run before?

→ 14 miles more

Problem 2:

Grete Waitz was born on October 1, 1953, how old is she now?

→ Answer varies by year and date.

Challenge 1:

Grete went on to win the New York City Marathon 9 times. If you combined all the miles from the 9 marathons, how far had she run?

→ 234 miles

Challenge 2:

Grete's hometown in Norway is 3,666 miles away from New York City. How many marathons would Grete have to run to cover that same distance?

→ 141 marathons

Lesson: Hydration Challenge

Grades: 3-4

Skills: Number sense

Time: 30 minutes

What to do:

Remind students how important it is to drink water during exercise. Present the following problem to the students.

Problem 1:

A runner in the marathon drinks 4 ounces of water at every odd mile marker, and he drinks 6 ounces of water at every even mile marker. How much water does the runner drink during the whole marathon?

→ Odd mile markers $13 \times 4 = 52$ ounces

Even mile markers $13 \times 6 = 78$ ounces

Total: $78 + 52 = 130$ ounces

Challenge:

If a runner takes 12 ounces of water at each mile marker of the marathon, but spills 5 ounces each time, how many ounces of water has she drank when she finishes the marathon?

→ $12 - 5 = 7$

$7 \times 26 = 182$ ounces

Lesson: Marathon Math
Grades: 3-4
Skills: Problem solving, number sense
Time: 20 minutes

What to do:

Read the following problems and have students solve them and show their work. When they are done ask them to share their strategies for solving the problems.

Problem 1:

You decide to run the New York City marathon and find out the race is 26 miles long - wow that's a lot of running! You train, and train, and train, and on race day you run and finish the whole thing!!! You have so much fun (and pain) running the New York City marathon, you decide to run the race again for the next 3 years. Can you figure out how many total miles you will run for the 4 marathons?

→ 104 miles

Challenge:

Actually, an official marathon is exactly 26 miles 385 yards. If there are 3 feet in every yard, how many extra feet will you have to run once you pass the 26-mile marker?

→ 1,155 feet

Super Challenge:

If there are 5280 feet in a mile, how many feet are in the marathon? Can you solve this without a calculator?

→ 138,435 - including the 385 yards that make it an official marathon.

Lesson: Marathon Winners Math
Grades: 3-4
Skills: Arithmetic, adding large numbers
Time: 20 minutes

What to do:

After distributing the worksheet on the following page and discussing the chart with the students, tell them to answer the questions. Discuss shortcuts for adding a large list of numbers. For problem 2, they should be aware that doubling their answer will solve the question. Use multiplication or addition to double.

Place	Prize	Bonus	TOTAL
1 st	\$100,000	\$30,000	\$130,000
2 nd	\$45,000	\$20,000	\$65,000
3 rd	\$30,000	\$10,000	\$40,000
4 th	\$20,000	\$0	\$20,000
5 th	\$15,000	\$0	\$15,000
6 th	\$10,000	\$0	\$10,000
7 th	\$7,500	\$0	\$7,500
8 th	\$5,000	\$0	\$5,000
9 th	\$2,500	\$0	\$2,500
10 th	\$1,000	\$0	\$1,000

Problem 1:

Calculate what should be in the **TOTAL** column for each runner, then find the total amount of prize money for all the runners in 1-10th place.

→ \$296,000

Problem 2:

If the prizes in the table are just for the women runners, and the winning men get exactly the same prizes, how much money is paid out to the male and female runners in total?

→ \$592,000

Name: _____

Marathon Winner Worksheet

Study the following chart of prizes for a marathon. Notice the bonus for the first three runners.

Place	Prize	Bonus	TOTAL
1 st	\$100,000	\$30,000	
2 nd	\$45,000	\$20,000	
3 rd	\$30,000	\$10,000	
4 th	\$20,000	\$0	
5 th	\$15,000	\$0	
6 th	\$10,000	\$0	
7 th	\$7,500	\$0	
8 th	\$5,000	\$0	
9 th	\$2,500	\$0	
10 th	\$1,000	\$0	

Problem 1:

Calculate what should be in the **TOTAL** column for each runner, then find the total amount of prize money for all the runners in 1-10th place.

Problem 2:

If the prizes in the table are just for the women runners, and the winning men get exactly the same prizes, how much money is paid out to the male and female runners in total?

Lesson: Measure the Gym
Grades: 3-4
Skills: Measurement, number sense
Time: Varies

What to do:

Measure your gym. First, decide on a measurement tool with your students. Discuss why rulers are not a good choice because they are too small. Use a tape measure, yardstick or trundle wheel if one is available. Be sure to get measurements in yards.

Discuss when measurements of a rectangle are made, only two sides, the length and width, need to be measured, as the corresponding two sides will have the same measurements.

Once measurements are made have students work on the following problems:

Problem 1:

How many yards is it around the whole gym?

(Students should add up the measurements of each side)

Problem 2:

How many feet are in one yard? How many feet is it around the whole gym?

(1 yard = 3 feet)

Challenge:

How many feet are in one mile? How many times will you have to run around the gym for it to equal a mile?

(1 mile = 5,280 feet)

Lesson: **Mighty Milers Prize Math**
Grades: 3-4
Skills: Problem solving, arithmetic
Time: 15-20 minutes

What to do:

Read problems with students. Have them use the prize chart on the following page to answer the problems. Make sure they show their work. When they are finished, discuss strategies they used to solve problems.

Problem 1:

If a student has earned a NYRRF pencil how many more miles would they have to run before they earn their bag?

→ 65 miles

Problem 2:

12 students run enough miles to earn pencil cases, and 6 students run enough miles to earn their first sticker. How many miles have the students completed in total?

→ 210 miles

Challenge:

If the students in a class ran a total of 900 miles and each student ran the same number of miles, how many pencil sharpeners would they get?

→ 20 pencil sharpeners

Lesson: Mighty Milers Prize Math (continued)

Mighty Milers Prize List

5 Miles	Certificate
10 Miles	Pencil Case
15 Miles	Sticker
20 Miles	T-shirt
26.2 Miles	1st Marathon of Miles Medal

30 Miles	Certificate
35 Miles	Pencil
40 Miles	Sticker
45 Miles	Pencil Sharpener
52.4 Miles	2nd Marathon of Miles Medal

60 Miles	Certificate
65 Miles	Eraser
70 Miles	Sticker
78.6 Miles	3rd Marathon of Miles Medal

85 Miles	Certificate
90 Miles	Ruler
95 Miles	Water Bottle
100 Miles	Bag
104.8 Miles	4th Marathon of Miles Medal