

Name \_\_\_\_\_

## MAMA'S BOYZ

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## JERRY CRAFT



### WALKTOBERFEST

A number of organizations have used Walktoberfest as a fundraising or health promotion activity, including the American Diabetes Association and the Humane Society. Some groups plan one-day events; others promote an event for a month.

1. How many steps do you think you walk in an average day? Would you say this number differs from weekdays to weekends? How about from winter to summer?
2. According to the American Diabetes Association, people should walk 10,000 steps per day. About how many miles is that?
3. The American Diabetes Association has determined that walking 5 minutes per day can burn 24 calories. Walk for 5 minutes, and keep track of the number of steps you take. About how many steps does it take to burn 24 calories? How many calories would you burn by taking 10,000 steps?
4. If Mama and her two boys each walk 22 minutes per day, how many calories would the family burn in a day? A week? A year?
5. Females between 9–13 who are moderately active should consume 1600–2000 calories a day. Males between 9–13 who are moderately active should consume 1800–2000 calories a day.\* Search “Calorie Counter” on the Web to find a site that will allow you to compute the number of calories for various foods. Keep track of your caloric intake for 1 week. How does your daily average compare with the recommendations for your gender and age group?

### CHALLENGE

6. If you consume more calories a day than the recommended average, determine how many extra minutes of walking you would need to do in 1 year to compensate. How many extra miles of walking would be required? Plan a diet for 1 week that keeps you within the recommended caloric intake for your gender and age group.

\* Information from [www.WebMD.com](http://www.WebMD.com)

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## SOLUTIONS

- Answers will vary. Students should recognize differences across seasons, parts of the week, and so on.
- Answers will vary. Someone who is 6 ft., 2 in. will have a longer stride and will therefore be able to take longer steps than someone who is 5 ft., 2 in. Someone walking on a flat, dry sidewalk will cover much more ground than someone walking on any icy path. For a ballpark figure, assume that a person can cover 2.5 feet per step. For 10,000 steps that is

$$\frac{25,000 \text{ ft.}}{5280 \text{ ft./mi.}} \approx 4.73 \text{ mi.}^{**}$$

- Answers will vary, depending on the speed at which a student walks. If you walk 500 steps in 5 minutes, then there will be  $10,000 \div 500 = 20$  intervals for 10,000 steps. At 24 calories per 5-minute interval,  $20 \times 24 = 480$  calories will be burned in  $20 \times 5 = 100$  minutes. Instead of walking and counting for 5 minutes, students might walk for 1 minute and then multiply to calculate the number of steps they would take in 5 minutes.

- Three people each walking 22 minutes a day will total 66 minutes per day;  $7 \times 66 = 462$  minutes/week; and  $365 \times 66 = 24,090$  minutes/year. Since 5 minutes of walking can burn 24 calories:

$$\frac{66}{5} \times 24 = 13.2 \times 24 = 316.8 \text{ calories/day}$$

$$\frac{462}{5} \times 24 = 2217.6 \text{ calories/week}$$

$$\frac{24,090}{5} \times 24 = 115,632 \text{ calories/year}$$

- Answers will vary.

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**\*\*** Have your students design a way to determine the lengths of their individual strides. For example, they might walk a fixed distance and count the number of steps or vice versa.

## FIELD-TEST COMMENTS

My sixth-grade students had a good discussion regarding how to measure the length of a “walking” step. Students used metersticks, measuring tapes, masking tape, string, and chalk to find the measurement. Each group was encouraged to think of its own procedure. Some groups decided to put two measuring tapes together on the ground (120 inches, or 300 cm) and count how many steps were needed to complete that distance. Other groups used chalk to mark how far each student walked after 10 steps, then used the measuring tools to find the distance. Without prompting from me, several groups walked four times and used the average as their data.

Unfortunately, I did not have access to pedometers to count how many steps students walked in 5 minutes. Students quickly realized that instead of counting the number of steps for 5 minutes, they could count the steps for 30 seconds or 1 minute to predict the number of steps for 5 minutes. These measuring processes seem trivial to adults, but I believe that middle school students can benefit greatly from such authentic and meaningful learning experiences to apply their knowledge in measurement and estimation. Determining reasonable procedures to gather meaningful data is also an important skill.

The most challenging part of the activity was converting units. I found that the combination of informal units

(walking steps) and formal units (inch, foot, mile, minute, and calorie) made the activity interesting and different from typical textbook problems. Unit conversion is known to be a problem area for sixth graders. When proportional reasoning is studied later in the school year, I will work on unit conversions using proportions. It will be interesting to revisit this activity to see if students choose different approaches and if they have a better understanding of the problems at that time.

**Stephanie Ling**

*Redwood Middle School, Saratoga, California*

I conducted this activity with several eighth-grade classes—both regular curriculum and algebra classes. Students sat in groups as we discussed the first questions together. Each group agreed on an estimate of the number of steps that an average eighth grader takes in an average day. I was surprised at how reasonable many of the groups’ estimates were (many groups guessed in the 5000–10,000-step range). The class then went outside. Each student counted his or her steps for 1 minute (I shortened this number from the 5 minutes suggested in the problem) and returned to class to do the calculations for the remaining questions.

I switched the third and fourth questions. I used the same introduction to question 3 (walking 5 minutes burns

24 calories) but then asked how many calories Mama and the boys would burn in a day, a week, and a year. Question 4 became this: Based on the data provided, how many calories would you burn in 10,000 steps?

The calculations built on each other that way, and the problem flowed smoothly. Overall, the activity gave students good practice in converting from one unit to another and estimating reasonable answers. The topic was very engaging and effective.

Our school district's employees can enroll in a wellness program that uses a pedometer to track steps. Participants are rewarded on the basis of increased levels of activity. I showed students the data from my pedometer, and they saw how their own conclusions about different seasons and days of the week matched the data.

**Dave Johnston**

*Luna Middle School, San Antonio, Texas*

## OTHER IDEAS

This activity would be ideal for data collection and analysis:

- If the class were involved in a Walktoberfest event, data could be collected on the class or on all participants.
- If the class has access to pedometers, data on the distance walked could be collected for a week or for a month. The class could graph the data and make comparisons of activity across the time period.
- If students choose to diet, data on the numbers of calories consumed could be collected, graphed, and compared.

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