Lesson Plan: *Super Grandpa*
by David M. Schwartz
illustrated by Burt Dodson

Lesson Plan by Christina Nugent
Veteran Teacher and Math Supervisor
Presidential Award Winner for Excellence in Teaching of Mathematics
Dubuque Public Schools, Dubuque, IA

Grade level: 4-6

Objective:
- Students will use map reading and measurement skills to design a bike race.
- Students will make connections between the real world and mathematics.
- Students will see the flaws and unfairness of stereotyping.

Materials:
- US maps that have major roads and mileage marked
- map or globe on which Sweden can be located.

Introduction:

- The teacher reads the main part of the book (excluding the Author Note at the back) to the class or students read the book in partners or the students read the book to themselves or the teacher plays the included CD of the author reading the book – or some combination (such as students reading aloud and also listening to the author's reading, comparing the author's use of expression with their own).
- The word "stereotype" is used when people make assumptions about all members of a group of people. Stereotypes are almost always incorrect and often damaging.
- What was the stereotype in the book? How was it damaging? What was so important about what Gustaf did?
- The teacher reads the Author Note at the back of the book.
- Discuss the lesson about stereotyping in the story. (See the back matter, especially this statement: "Super Grandpa shattered a stereotype. He suffered when society deemed senior citizens unfit, just as ethnic minorities, women, and those who are physically disabled suffer when society deems a whole class of people inferior or incompetent.")

Procedure:
- The "theme" (lesson or moral) of *Super Grandpa* is about stereotyping. The "plot" involves a bicycle race. Discuss the difference between "theme" and "plot," drawing upon familiar books, stories, legends, etc.
- How long was the race? Ask for the distance in kilometers and miles (both are given in the book). Discuss the two systems of measurement (background information can be found in *Millions to Measure* by the same author), pointing out:
    - miles are used in the US and kilometers are used almost everywhere else

- there is a mathematical relationship that enables us to convert from miles to kilometers and vice versa (see *Millions to Measure* or other books or encyclopedia or various websites). . . but. . .
- if you're trying to learn to use the unfamiliar system, it is better not to find or use conversions, in the same way that you learn a foreign language only when you're immersed in it, not if someone is constantly translating for you.

- Considering how far Gustaf had to ride to get to the starting line, how many kilometers did he ride all together?
- The race itself was 1,700 kilometers. What are some places that are about 1,700 miles from where you live? Remember that if you are looking at a US map, distances are probably given in miles. Some maps have both miles and kilometers in the legend.
- We are going to pretend that we are going to have a 1,000 mile bike race starting in our town. Your job is to look at the map and plan the route. You must stay on the roads. What towns would the race go through? Where would the race end?
- When you are finished you need to be able to give a one-minute summary explaining your race route. Why did you choose the route you did?

Closure:

- Have each group share their race routes.
- Why are the routes different?
- How did you determine which route you would take?
- Do all of the destinations make a circle? Why or why not?

Extensions:

- Research other bike races and complete the chart. Use your chart to make a graph comparing the distances. Write at least 5 questions that can be answered using the graph. Show your graph to a friend and ask your questions. (Note: RAGBRAI is an annual bicycle ride sponsored by the *Des Moines Register*, a newspaper in Iowa. The letters stand for "Register's Annual Great Bike Race Across Iowa." Other bike races can be found by looking under the USA Cycling's website. They don't have to be as famous as The Tour de France.)
- Allow students to read the book and formulate some of their own questions based on the book. How many miles did Gustaf ride each day? About how fast did he ride? How much sleep did he get all together? Even though finding exact answers to some of these questions may not be possible, students can estimate or take reasonable guesses and justify their estimates.
- Have students mark different places on the map that are 1,000 miles, as the crow flies, from their school (or town). What shape do these points suggest? (Hint: if you marked off all the points 1,000 miles from your town, they would create that shape.) Draw that shape on the map. (It is a circle). What distance is represented by the "radius" of that shape? (1,000 km) What term is used to describe the location of your school in that shape? (The center.) What distance is represented by the diameter of the circle on the map? (2,000 miles.) What is the mathematical

relationship between the radius and the diameter of a circle? (The diameter is twice the radius.)

- Measure the diameter of your circle with a ruler. Also measure the circumference. How can it be done? (Use a string.) Use a calculator to divide the circumference by the diameter. The answer you find on the calculator is an approximation of the famous “irrational” number known as π (“pi”). Draw other circles of different sizes and do the same thing. Do you get the same result when you divide the circumference by the diameter?
- (Advanced Question): We have seen that dividing a circle’s circumference (abbreviated as “c”) by its diameter (“d”) will give a number called π. It doesn’t matter how large or small the circle is. How would you find the circumference of a circle if you only knew the circle’s diameter? (Multiply by π). What formula expresses the mathematical relationship between circumference and diameter? ($\pi d = c$) [Note: when writing formulas and equations, mathematicians usually do not bother to write “x” to indicate multiplication. So πd is the same “π x d’ (π times d). The reason mathematicians avoid using “x” as a symbol for multiplication is that “x” is also used as a variable, and to use it in both ways would result in confusion. The use of “x” and other letters as “variables” is explained in another book by the same author, *G Is for Googol: A Math Alphabet Book*, under the entry for the letter “X.”
- Read *Millions to Measure*, a book about measurement by the same author. Why do you think the United States does not use the metric system? Do you think we should switch? Why or why not?

Bicycle Race Planning Guide

1. **Starting Point:**

2. **Ending Point:**

3. **Trace your route on the map**

4. **Complete the chart**

Day	Starting City	Ending City	Number of Miles
1			
2			
3			
4			
5			

Explain why you chose the route that you used:

Famous Bike Races

Directions: Use the Internet to research bike races and complete the chart. A couple of examples are given to get you started.

Name of the bike race	Location	Distance*	Number of days	Other information
Tour de France				
Giro				
RAGBRAI				

*** Use the same unit of distance (miles or kilometers) used in the country in which the race takes place.**

1. Create a graph(s) of the information from the chart.
2. Write 5 questions that could be answered by looking at your graph. (Which is the longest? Which is the shortest? Mean? Median? Mode? Which one represents the data best? How much longer is the Tour de France than the Giro? Similar questions could be asked about the number of days. Students could make a double bar graph or two different graphs of distance and days.)