

RICE PRODUCTION

Teaching Guidelines

Subject: Mathematics

Topics: Algebra—Coordinate Systems; Linear Equations and Functions

Grades: 6 - 12

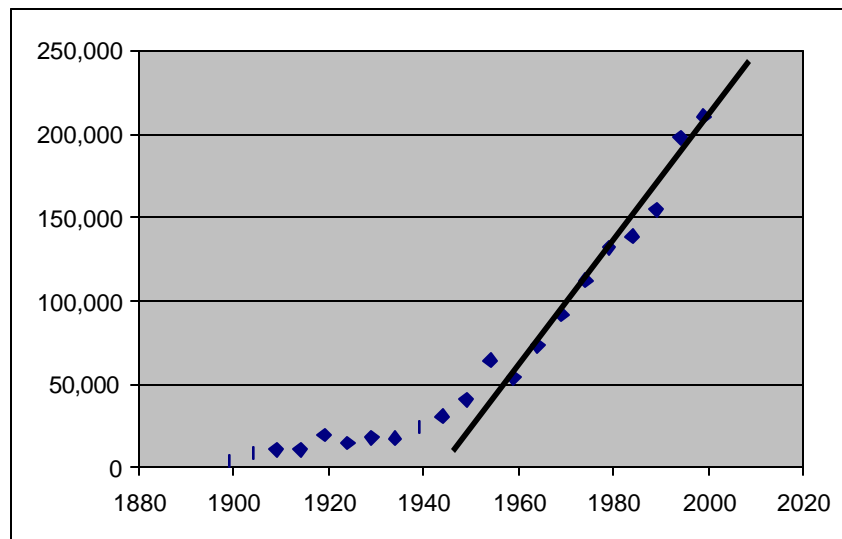
Knowledge and Skills:

- Can plot a point in a two-dimensional coordinate system, given the coordinates, or determine the coordinates of a given point
- Can extrapolate a graph when a pattern exists
- Can use a functional relationship to predict the value of one variable when the other is known
- Can determine the equation of a linear function that closely matches a set of points
- Can solve a one-variable linear equation

Materials: None

Procedure: This activity is best done by students individually or in teams of two.

When they graph the data, they will need to determine what the variables are (year, amount of rice produced), and which is independent (year) and which is dependent (rice)



The line above represents a good fit to the given data in the domain of 1959 to 1999; its equation is:

$$y = 3670x - 7,130,810$$

Solving this equation for $x = 2004$ gives 223,870 hundreds of pounds of rice.

Solving for $x = 2005$ gives 242,200 hundreds of pounds of rice.

Solving for $y = 250,000$ gives the year 2011.

Rice Production

Investigation

The table below shows how much rice has produced in the United States, every 5th year for the past 100 years.

Year	Hundreds of pounds of rice produced
1899	4,029
1904	8,647
1909	10,614
1914	10,565
1919	19,310
1924	14,689
1929	17,790
1934	17,571
1939	24,328
1944	30,974
1949	40,769
1959	53,647
1954	64,193
1964	73,166
1969	91,904
1974	112,386
1979	131,947
1984	138,810
1989	154,487
1994	197,779
1999	210,458

Can you use this data to predict how much rice might be produced in the years 2004 and 2009? Can you predict in what year rice production will reach 250,000?

Here is one approach:

1. Graph the above data.
2. See if there is a pattern to the data. Extend the pattern to estimate the number of pounds of rice that would be produced in the year 2004.

_____ hundreds of pounds

3. Extend the pattern further to estimate the number of pounds of rice that would be produced in the year 2009.

_____ hundreds of pounds

4. Extend the pattern further to find the year for which the amount of rice produced is 250,000.

If you know enough algebra, you can find a more exact answer by using equations, as follows:

1. Look at the data on the graph from 1959 to 1999. These points nearly all line up on a straight line.
2. Draw in a line that comes closest to the data points, and find its equation.
3. Use that equation to predict the production of rice in 2004 and 2009.

2004: _____

2009: _____

4. Use that equation to find in which year you would expect rice production to be 250,000 hundreds of pounds.
