# FARMERS MARKET
# (Systems of Linear Equations – Slope-Intercept Form)

## Lesson:

Engage students in the content.

A farmer wants to estimate the cost of transporting his produce to market. There are two trucking companies that he can choose from to transport his produce. The Long Haul trucking company charges $10.00 per mile and a flat fee of $1000. The Keep On trucking company charges $4.50 per mile and a flat fee of $1500.

1. For each trucking company, complete the tables that show the number of miles to market (*m*) and the total cost of transporting the produce (*T)* if the markets are 10, 20, 30, 40, and 50 miles away. (CLG: 1.1.2)

2. Enter your data into the list storage of your calculator. (CLG: 1.1.2)

> Teacher Tip:
> Discuss with students how to name their lists. This will help them save their lists for many different activities, so they can go back to them if they need to.

3. Set up an appropriate graphing window, and then graph the data. (CLG: 1.1.2)

> Teacher Tip:
> Discuss with your students what makes an appropriate window. Discuss the mathematics behind graphing data just as if you were graphing it on paper. Discuss the domain of the x values, and the range of the y values. Help students to see the data points in different windows and understand the need for an appropriate window.

4. What type of relationship exists among the data points for each trucking company?

> Teacher Tip:
> Discuss with the students linear and non-linear relationships.

5. For each trucking company, determine the equation that best describes the relationship between the miles to market (*m*) and the total cost of transporting the produce (*T*). Use mathematics to explain how you determined your equations. Use words, symbols, or both in your explanation. (CLG: 1.2.1)

Long Haul trucking company equation: _____

Keep On trucking company equation: _____

> Teacher Tip:
> Discuss with the students the meaning of the slope in the equation. Also discuss with them how to explain the steps they went through to get the equation.

6. Use your equations to determine how much each trucking company would charge to transport the produce to a market 100 miles away. Use mathematics to explain how you determined your answers. Use words, symbols or both in your explanation. (CLG: 1.2.1)

7. What does the y-intercept of each line mean in terms of the context of the problem?

8. Using your calculator, find the point of intersection of the two lines. (CLG: 1.2.3)

> Teacher Tip:
> - Enter both equations into the equation screen of the graphing calculator. Graph the equations with an appropriate window and use the functions of the calculator to find the point of intersection.
> - Discuss the meaning of the intersection of two equations.
> - Discuss systems of equations and their solutions.

9. For what distance would the cost of transporting the produce be the same for both trucking companies? Round your answer to the nearest mile.

10. What is the cost of transporting the crops this distance?

11. Use mathematics to justify your answers to numbers 9 and 10.