9

Phone Plans

> *How do I know which plan is best for me?*

Synopsis

Students piece together information about four long-distance phone plans and decide which plan best suits three customers with different needs. Previously, situations revealed patterns with a constant increase or decrease; here students also consider a situation where there is no change.

1. Pairs match ads, tables, graphs, and equations for four phone plans.

2. The class comes together to discuss graph and equation features that aided the matching process.

3. Pairs consider three consumer scenarios to decide which plan would be best and which would be worst for the customer, and justify their reasoning.

5. Everyone reflects on the representations, and the class discusses which tool they would use if faced with a similar situation.

Objectives

- Match graphs, tables, equations, and verbal rules by identifying the related features in each representation

- Connect the flatness of a horizontal line on a graph to a situation in which there is no change over time

- Use information from tables, graphs, rules, and equations to support consumer decisions

Materials/Prep

- Calculators
- Newsprint or transparencies
- Rulers
- Tape or glue

Make an enlarged version of each phone-plan graph (*Student Book*, pp. 114–15), on newsprint, or reproduce the graphs on transparencies.

Photocopy *Phone Plans*, *Blackline Master 6*, one for every pair of students. Cut the 12 pieces apart and put them in an envelope. (Students could do the cutting as well, but the scrambled pieces with unknown equations are more dramatic.)

Opening Discussion

(Optional: You might want to briefly review inequality symbols, which will be used in the phone-plan description. Write on the board: >, <, =. Ask volunteers to come to the board to read and write statements using one of the three symbols. Students share ways they remember the direction of the "is greater than" and "is less than" signs.)

Open by displaying a sketch of the salary graphs from *Lesson 8*.
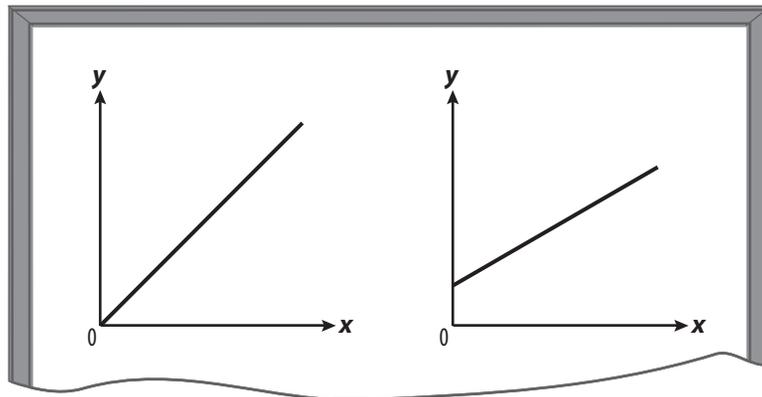
Ask:

💬 **What on the graph told you about the starting bonus?**

💬 **What on the graph told you who was getting a higher weekly rate of pay?**

Say:

💬 **Today you will have four phone plans to compare in order to make some consumer decisions.**

Activity 1: Phone Plans

Pair up students and distribute an envelope of cards (*Phone Plans*, *Blackline Master 6*) to each. Ask for a volunteer to read aloud the directions for *Phone Plans* (*Student Book*, p. 114). Allow everyone to work independently for 10 minutes,

attaching the graphs to their matching representations. Observe which features draw students' attention and are used to help them connect representations.

Challenge those who finish quickly with an additional question:

💬 **Which monthly plan is the best for $50? Why?**

Then ask students to pair up again to share their reasoning. Ask some pairs that come to agreement to write the equation, table, and ad for one plan on the enlarged versions of the graphs that you prepared earlier.

Draw the class together to address each plan. Pose questions that illuminate the graph features:

💬 **What tells you these go together?**

💬 **Where do you see the table data in the graph?**

💬 **Where do you see the equation in the graph—the coefficient, or the constant number added?**

Invite students to the board to demonstrate how they made the connections. In particular ask:

Phone Plan A

💬 **Why does this line start here?** (Point to the origin.)

Phone Plan B

💬 **Why does this line start here?** (Point to (0, 5).)

💬 **Which graph is steeper—Plan A's or Plan B's? What does that tell you?**

Phone Plan C

💬 **How is this graph different from those for Plans A and B?**

💬 **Why is part of the graph flat?** (Encourage references to the tables and equations to support statements made.)

💬 **What is happening at this point?** (Point to (1,000, 40).)

💬 **What would the ad say if the graph looked like this?** (Draw a flat line: $y = 40$.)

Phone Plan D

💬 **Compare the graphs of Plan D and Plan C.**

Clear up any confusion about the equations by asking questions such as

💬 **Why do you subtract 1,000 from M in the equation for Plan C and subtract 250 from M in the equation for Plan D?**

Ask for some examples to emphasize the connection between the situation described verbally in the ad and symbolically in the equation. Then ask about the rate of change:

💬 **Which plan shows the fastest rate of increase in cost for any period of time? What tells you that information?**

Expect to hear that some see the rate of increase in the graph and others in the equation for Plan C.

Heads Up!

The conversation in this first activity can get very involved. Move on to the next activity. In the summary, continue discussing connections between representations.

Activity 2: It Would Depend on the Person

Turn to *It Would Depend on the Person* (*Student Book*, p. 116).

This activity uses the phone-plan representations to support a consumer decision. Students will need all four re-pieced ads to come to a good recommendation. Three kinds of customers are portrayed.

Suggest students count off: 1, 2, 3, 1, 2, 3 … to determine the number of the problem they will work on. Allow them to work independently for about 15 minutes.

When most students have completed the problem, ask all those with the same numbers to form groups to share their answers and the ways they made their decisions. Allow time for each group to come to a common agreement for a phone plan for its customer. Then ask a spokesperson from each group to make a persuasive recommendation to their customer as to the *best* and the *worst* plan for that person. Every statement should be justified using at least one type of representation.

If the following have not been answered by the group's spokesperson, ask:

💬 **Which representation(s) did you use to help you decide?**

💬 **What information in that representation swayed your decision?**

💬 **How is your decision supported by another representation?**

Assign Problem 4 to groups who finish early or for homework.