**Lesson Title:** Graphing Proportional Relationships  
**Course:** Common Core 7  
**Date:** _____________  
**Teacher(s):** ________________  
**Start/end times:** 1-2 50 minute periods

### Lesson Objective(s): What mathematical skill(s) and understanding(s) will be developed?

7.RP.2b Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

7.RP.2d Explain what a point \((x, y)\) on the graph of a proportional relationship means in terms of the situation, with special attention to the points \((0, 0)\) and \((1, r)\) where \(r\) is the unit rate.

### Lesson Launch Notes: Exactly how will you use the first five minutes of the lesson?

Write at least three different strategies you can use to solve proportions. Explain the strategies.

### Lesson Closure Notes: Exactly what summary activity, questions, and discussion will close the lesson and provide a foreshadowing of tomorrow? List the questions.

- What are necessary components for a graph of a proportional relationship?
- Why is the origin important?
- What is the importance of the \(y\) value when \(x\) is one?

### Lesson Tasks, Problems, and Activities (attach resource sheets): What specific activities, investigations, problems, questions, or tasks will students be working on during the lesson?

1. Have students read the scenario about saving their allowance to buy a new pair of shoes. If wanted, brainstorm ways that you can solve the problem. Allow students time to solve the problem and come up with an answer. If students have extra time, challenge them to use a different strategy and see if they can come up with the same answer. When students finish, have them share their strategies with the class. (There is room on the resource sheet for them to use a ratio table, tape diagram, or space for whatever work they would like.)

2. Tell students that they will now graph their finding on the coordinate grid. This will be their rough draft so it is okay if they make mistakes. Remind students that they need to include labels and units.

3. Take a gallery walk to look at the students’ graph. What was the same? Different? Compile a list of things that are needed for the graphs of proportional relationships. (Note: Most students will have graphed “total saved vs. number of weeks,” with the \(y\)-intercept \((0, 45)\). Since this graph does not pass through the origin, it does not represent a proportional relationship.)

4. Have students analyze the situation to determine which part of the problem represents a proportional relationship (i.e. the slope \(7\) to be saved each week). Ask students how could the table and graph be adjusted just to focus on the proportional relationship. (The \(y\)-axis label will need to change to the amount of new money saved.)

5. Ask students, at week 0, how much more money have you saved? (Note: They may respond that they have saved \(45\) dollars, but we only want to look at amount put into the saving account per week, not the total amount in the piggy bank.) At week 0, there has been \(0\) saved, so we would start at \((0,0)\). Reinforce the term origin and why it is important in the problem.

6. Have students continue to plot their points on their graph. After one week, how much money is saved? After five weeks? Twelve weeks?

7. After students have plotted their points, ask what do they notice about the graph. It makes a straight line. It has a positive slope, is increasing. Constant change.

8. Draw the students’ attention to week one. How much money has been saved? \(\$7\). What does the \(\$7\) represent? (Note: Help students understand that \(7\) is the unit rate. This represents the amount of money saved for one week and that the graph increases by \(7\) for every week. This is the constant change and also the slope.)

Extensions: Can you write an equation for the line graphed?
Evidence of Success: What exactly do I expect students to be able to do by the end of the lesson, and how will I measure student mastery? That is, deliberate consideration of what performances will convince you (and any outside observer) that your students have developed a deepened (and conceptual) understanding.

Correctly label the x- and y-axis for what the problem is asking. Graph the proportional relationships correctly by ensuring that the graph passes through the origin. Explain the importance of the origin and the point (1, r) in context of the problem.

Notes and Nuances: Vocabulary, connections, common mistakes, typical misconceptions, etc.
Vocabulary – proportional relationship, constant change, origin

Common mistakes: Students may try to use the starting amount in their piggy bank as the starting point instead of the origin since the question is asking for money saved each week, not total in the piggy bank.

Resources: What materials or resources are essential for students to successfully complete the lesson tasks or activities?

Graphing resource sheet

Homework: Exactly what follow-up homework tasks, problems, and/or exercises will be assigned upon the completion of the lesson?

To be determined by teacher

Lesson Reflections: What questions, connected to the lesson objectives and evidence of success, will you use to reflect on the effectiveness of this lesson?

Do the students understand why the graph starts at the origin?
Do the students understand that the unit rate is represented?