# Compare Proportional Rates

Graph a rate from a table and compare its slope with an equation

Name: _____ Date: _____

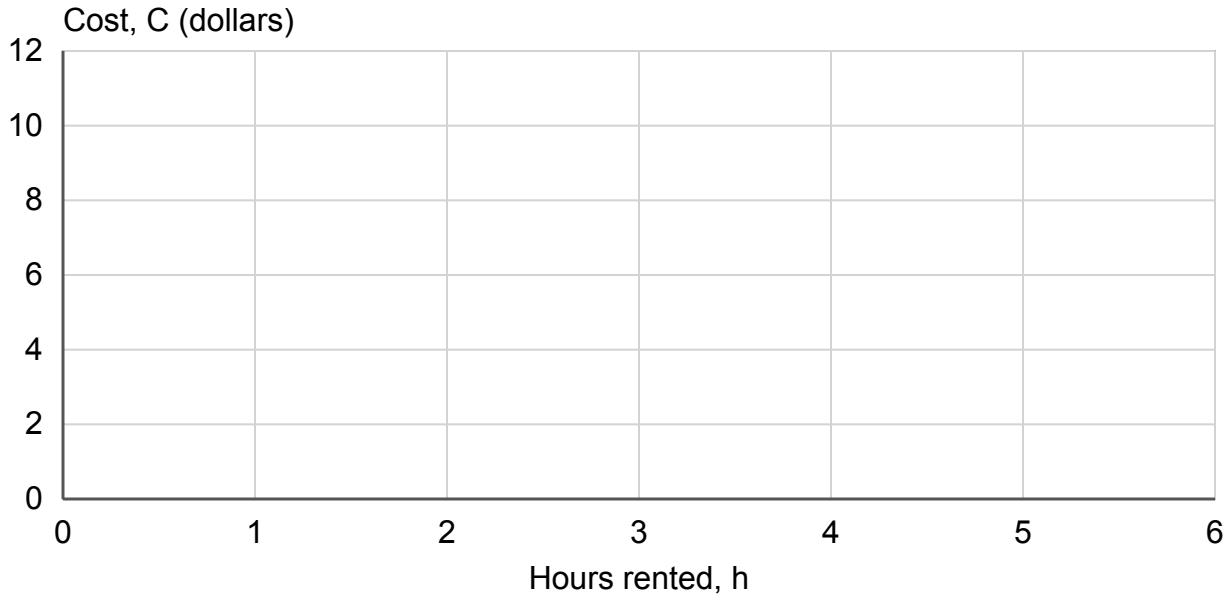
## Part 1 - Graph Plan A

### Bike Rental Plans

Plan A charges a proportional cost. Let h be the number of hours rented and C be the cost in dollars.

| **Hours, h** | **0** | **1** | **2** | **3** | **4** | **5** | **6** |
|---|---|---|---|---|---|---|---|
| **Cost, C ($)** | 0 | 2 | 4 | 6 | 8 | 10 | 12 |

**1.** Plot the table pairs. Draw one straight line through the points and the origin. Label the line Plan A.




Listen as your teacher reads the launch for this task. Check that each plotted point has hours first and cost second.

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## Part 2 - Compare the Unit Rates

**Plan B** is represented by the equation C = 1.50h, where C is cost in dollars and h is hours rented.

**2.** Find Plan A's slope (unit rate). Use two points from its graph or table. Show a rise/run calculation with units.

**3.** What is Plan B's slope (unit rate)?

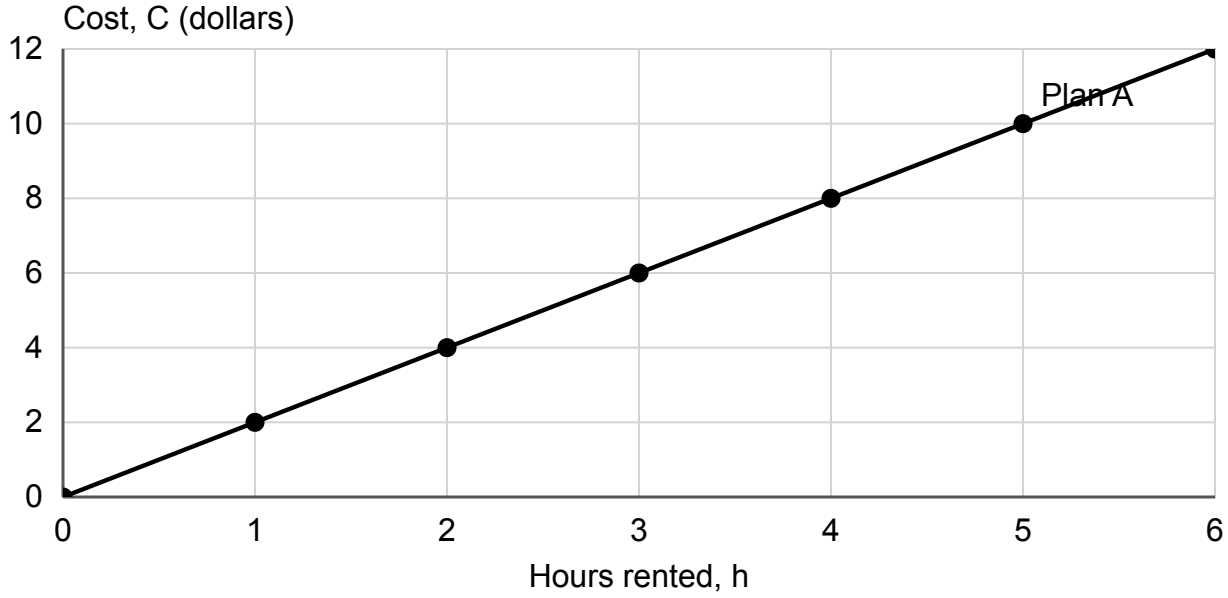
**4.** Which plan costs more per hour? By how much per hour? Explain how the graph/table for Plan A and the equation for Plan B support your answer.

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## Answer Key - Compare Proportional Rates

**1.** Plot (0,0), (1,2), (2,4), (3,6), (4,8), (5,10), and (6,12), then draw the line through them. Label the completed line **Plan A**. The graph shows a proportional relationship because it is a straight line through the origin.




**2.** Plan A: (6 - 0) dollars / (3 - 0) hours = 2 dollars per hour. Other nonzero pairs give the same rate.

**3.** Plan B: 1.50 dollars per hour.

**4.** Plan A costs more, by 2.00 - 1.50 = 0.50 dollar per hour. A complete explanation identifies 2 dollars per hour from Plan A's rise/run or table and 1.50 dollars per hour as the coefficient of h in Plan B's equation.

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## Teaching Notes

**Setup:** Print and supply all student pages, keeping teacher-key pages separate. Give each student a pencil, ruler or straightedge, and the supplied coordinate plane in Part 1. Do not preplot points or draw Plan A's line.

**Materials:** Student pages, pencils, and rulers or straightedges. Optional: document camera or board for discussing the completed key after collection.

**Teacher-read launch:** “Both plans start at zero cost when zero hours are rented. On the graph, each ordered pair is written as hours first and cost second. Your slope tells how many dollars the cost changes for one more hour.”

**Observation method:** As students work, check whether they place at least five points using x = hours and y = cost, draw a straight line through (0,0), label the line Plan A, and include dollars per hour in the slope statement. Ask a student who reverses coordinates: “Which axis shows hours?” Do not tell students which plan is greater before they compare the two unit rates.

**Teaching script for discussion:** “Choose two points on Plan A. What does the vertical change measure? What does the horizontal change measure? Divide dollars by hours. Now look at Plan B: in C = 1.50h, what number is multiplied by each hour? Compare the two dollars-per-hour rates, not just the appearance of the representations.”

**Source credit:** Skill aligned to NY-8.EE.5, New York Next Generation Mathematics Standards reference: https://lessonmakerpro.com/standards/ny-nextgen-math/ny-8-ee-5. Bike-rental context and numerical data are original classroom materials.