

Free Ride Solution Guide

1. How many different gear ratios are possible? How do you know?

15

2. Determine the distance that the bike will travel three different gear ratios.

Answers will vary based on the gear ratios that students use but students should have the opportunity to see that as the ratios change, the distances change.

3. Use the information you have gathered so far to play **Free Ride**. What do you notice?

Answers will vary but students might notice that smallest rear gear (10) and the largest front gear (40) will produce the greatest gear ratio (4/1) and the longest distance (2). This information is useful for setting up the following task where students can develop a spreadsheet of gear ratios and distances.

4. Develop a table or spreadsheet that will help you play and win any route of **Choose Route** or **Random Route**.

Here students put the pieces together to help them win the game. Teachers might consider allowing students to play choose or play a random route prior to developing the table so that it creates a need for using such a tool.

Rear	Front	Gear Ratio	Distance Travelled
10	20	2/1	1
10	30	3/1	1 1/2
10	40	4/1	2
15	20	4/3	2/3
15	30	2/1	1
15	40	8/3	1 1/3
20	20	1/1	1/2
20	30	3/2	3/4
20	40	2/2	1
25	20	4/5	2/5
25	30	6/5	3/5
25	40	8/5	4/5
30	20	2/3	1/3
30	30	1/1	1/2
30	40	4/3	2/3