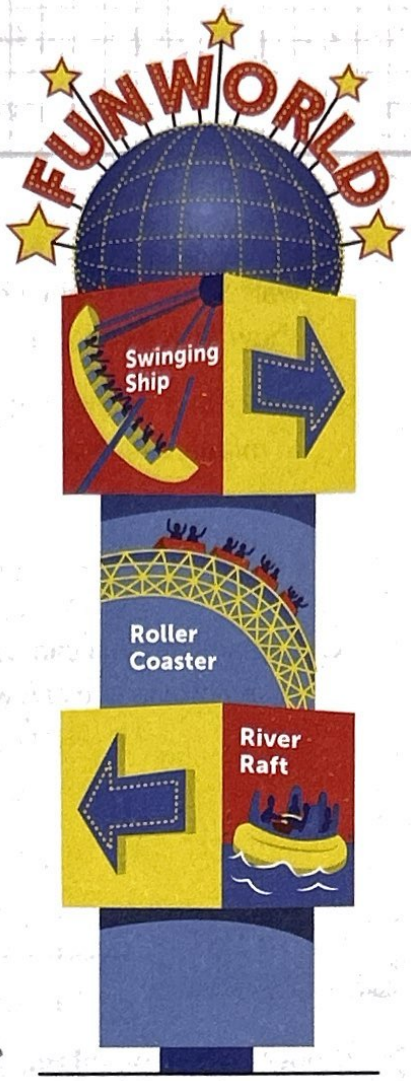
UNDERSTAND: What are rates and what do they tell you?

Develop Understanding of Rate Concepts

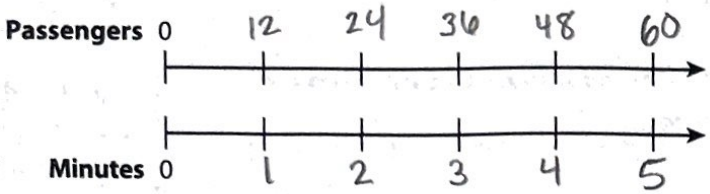


Model It: Compare Rates

➤ **Try these two problems involving rates.**

1. At a theme park, passengers are waiting in line for three rides.

   a. The Roller Coaster can load 60 passengers every 5 minutes. Complete the model to show the rate at which passengers are loaded per minute.

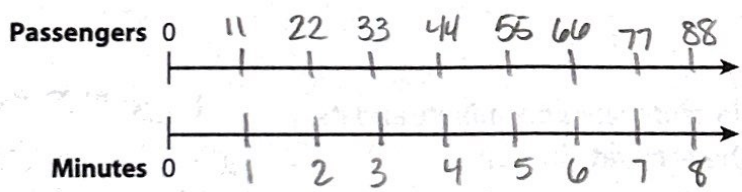


   b. The loading rate is 12 passengers per minute.

   c. The Swinging Ship can load more passengers than the Roller Coaster in the same amount of time. Is the loading rate for the Swinging Ship faster or slower than the rate for the Roller Coaster?

   The load rate for the Swinging Ship is faster.

2. **a.** Every 8 minutes, the River Raft can load 88 passengers. Complete the model to show the rate at which passengers are loaded per minute.



   b. The loading rate is 11 passengers per minute.

   c. Suppose the same number of passengers are in line for the Roller Coaster, the Swinging Ship, and the River Raft. If you want to get on a ride as quickly as possible, which line should you get in? Explain how you know.

   You should get in the Swinging Ship line. It has the fasting loading rate so you will wait the least amount of time.

DISCUSS IT

Ask: How can you determine whether the Swinging Ship or the River Raft has a faster loading rate?

Share: I think that a faster rate means . . .

Model It: Two Rates for a Ratio Relationship

➤ **Try this problem about rates.**

3 You can write two rates for any ratio relationship.

a. In Aja's city, all blocks are about the same length. It takes Aja 20 minutes to walk 5 blocks to the library. Complete the table of equivalent ratios to show Aja's two rates.

Minutes	Blocks
20	5
1	$\frac{1}{4}$
4	1

÷20 ÷5 ÷20 ÷5

b. Describe the rate that Aja walks in *blocks per minute* and in *minutes per block*.

Aja walks $\frac{1}{4}$ block per minute

Aja walks 4 minutes per block

c. Explain why Aja can use her rate in *blocks per minute* to estimate how many blocks she can walk in 45 minutes.

The rate tells how many blocks she walks in one minute so she can just multiply the number of blocks she can walk by 45

DISCUSS IT

Ask: How does the table of equivalent ratios show two rates?

Share: I can write two rates for any ratio relationship by . . .

CONNECT IT

➤ **Complete the problems below.**

4 Suppose Aja walks faster on her way home from the library. How will this change affect Aja's rate in *blocks per minute*? Explain.

The rate will increase. If Aja walk faster, she will walk farther in 1 minute.

5 Use a model to show the snail's rate in *centimeters per minute* and its rate in *minutes per centimeter*. Describe each rate in words.

cm	min
30	3
1	$\frac{1}{10}$
10	1

÷30 ÷30 ÷3 ÷3

The snail can travel:

10 cm per minute

or

$\frac{1}{10}$ min per cm