

# MATH

## Can Take You Places

### LESSON 3

## “Just Cruising”

by Monica Abrams

**CONCEPT AREA** Equivalency

**GRADE LEVEL** 4-6

**TIME ALLOTMENT** 60 minutes

**LESSON OVERVIEW** The students will complete activities that will give them experiences in equivalent number sentences.

**LESSON ACTIVITIES OVERVIEW** Use the data available to complete the task.  
Find all the equivalent number sentences, fact families and fractions.

**LEARNING OBJECTIVES** Students will be able to :

- define equivalency.
- find equivalent number sentences for a given number/problem.

**STANDARDS (TEKS)** From the Texas Essential Knowledge and Skills for Math for grades 4-6:

**Fourth Grade:** 4.4D, E, H

**Fifth Grade:** 5.3I

**Sixth Grade:** 6.1B; 6.2C; 6.5A

**MEDIA COMPONENTS** Video: *Math Can Take You Places #002 “Equivalency”*

**MATERIALS** One-inch graph paper

**PREP FOR TEACHERS** Cue the video to just past the opening.

**Note:**

The concept of **arrays** will be covered during this lesson. Students may need to review the concept prior to beginning the activities, especially if your class includes students who are acquiring English as a second language (ESL).

**INTRODUCTORY ACTIVITY: SETTING THE STAGE** Introduce the *Math Can Take You Places* equivalency video. Ask class to focus on the student problem-solving segments as they watch the video.

**LEARNING ACTIVITIES** I. Say: “You just saw how pilots use equivalency in their jobs. Now, we are going to use equivalency to help in a boat rescue. Pretend a luxury liner ran aground on an island. The passengers will need to be taken to the main island by rescue boats. The boats will each transport an equal number of passengers to safety.”

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2. Introduce the “Mansfield Luxury Liner” worksheet. Explain that in each scenario, all of the passengers must return to the mainland and each boat must have the same number of passengers. Work number one as a class.
3. Students will decide the number of passengers in each boat by division and give the equivalent number sentences, fact family and fraction that goes with each problem. For example, 432 passengers are on the ship. There are 54 rescue boats to use. How many passengers will travel in each boat?

The fact families are:  $54 \times 8 = 432$ , etc.

Equivalent fractions are  $\frac{1}{54} = \frac{8}{432}$

4. Students work in pairs to complete the remainder of “Mansfield Luxury Liner.”
5. Provide additional examples and assistance as needed.

#### CULMINATING ACTIVITY

1. Discuss the solutions from “Mansfield Luxury Liner.”
2. Use the solutions students calculated during the rescues to make equivalent arrays on one-inch graph paper.
3. Allow the students to show the different ways of displaying each of their solutions using arrays.

#### CROSS-CURRICULAR EXTENSIONS

Language Arts/Social Studies: Pretend the shipwrecked passengers decided to stay on the deserted island and start their own town. Discuss and write the laws that will govern the newly created community.

#### REAL-WORLD CONNECTIONS

After watching the entire *Math Can Take You Places* equivalency video, students can research time zones. Students then share the information with the class, including the name of the time zone where the school is located.

#### ASSESSMENT

“Mansfield Island”

Students will need the following information to solve the returning to the island scenarios:

- The number of passengers that will be returning to the island.
- The number of boats that will make the return journey.
- The number of passengers that will travel on each boat.

The student will find two of these in each scenario. The student will need to discover the missing information, then complete the calculations to complete the task.

#### STUDENT HANDOUTS

“Mansfield Luxury Liner”  
“Mansfield Island”

## Mansfield Luxury Liner

The passengers on the Mansfield Luxury Liner were preparing to have the time of their lives. With no warning, the ship ran aground. What will happen to them? Will there be enough rescue boats to return all the passengers safely to the mainland?

In each scenario, all of the passengers must return to the mainland, and each rescue boat must have the same number of passengers. After completion of the task, record all the equivalent number sentences, fact families and fractions.

1. 432 passengers are on the ship. They have 54 rescue boats to use to return to the mainland. What number will travel in each boat?

2. 12 rescue boats are carrying 17 passengers each. How many passengers are being transferred to the mainland?

3. There are 464 passengers being transferred in 29 boats. How many are in each boat?

4. 38 boats are being used to transfer all the passengers from the ship. There are 23 in each boat. How many passengers were on the ship?

5. There are 1,431 passengers on the ship, and 53 were transferred on each rescue boat. What was the total number of rescue boats used?

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### Mansfield Luxury Liner Answer Key

1. 8 passengers in each boat

$$432 \div 8 = 54$$

$$54 \times 8 = 432$$

$$432 \div 54 = 8$$

$$8 \times 54 = 432$$

$$\frac{1}{54} = \frac{8}{432}$$

Boats Passengers

2. 204 passengers transferred to mainland

$$12 \times 17 = 204$$

$$204 \div 17 = 12$$

$$204 \div 12 = 17$$

$$17 \times 12 = 204$$

$$\frac{1}{12} = \frac{17}{204}$$

3. 16

$$16 \times 29 = 464$$

$$464 \div 29 = 16$$

$$464 \div 16 = 29$$

$$29 \times 16 = 464$$

$$\frac{1}{29} = \frac{17}{464}$$

4. 874

$$38 \times 23 = 874$$

$$874 \div 38 = 23$$

$$874 \div 23 = 38$$

$$23 \times 38 = 874$$

$$\frac{1}{38} = \frac{23}{874}$$

5. 27

$$27 \times 53 = 1,431$$

$$53 \times 27 = 1,431$$

$$1,431 \div 53 = 27$$

$$1,431 \div 27 = 53$$

$$\frac{1}{27} = \frac{53}{1,431}$$

## Mansfield Island

After returning home, many of the passengers realized they missed the island and decided to return and build a community there. The same boat company was used to return the passengers to the island. The boats will each transport an equal number of passengers on their return voyage. To solve each scenario, you must have the following information:

1. The number of passengers returning to the island.
2. The number of boats that will make the return trip.
3. The number of passengers that will travel in each boat.

You will find these in each scenario. Record your information by writing a sentence for each fact. You will need to discover the missing information, write a sentence for that information and calculate the data to complete the task. You will then write all the equivalent number sentences, fact families and fractions that go with each problem.

1. Eight boats are carrying 12 passengers each to the island. All together, what is the total number of passengers returning to the island?

We know that:

- A.
- B.

We discovered that:

- C.

Equivalent number sentences:

2. Fourteen passengers are in each boat, and the total number of passengers is 126. What is the number of boats making the journey?

We know that:

- A.
- B.

We discovered that:

- C.

Equivalent number sentences:

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3. 288 passengers are making the return trip to the island in 12 boats. What is the total number of passengers in each boat?

We know that:

- A.
- B.

We discovered that:

- C.

Equivalent number sentences:

4. Seventeen boats are carrying 221 passengers to the island. Can you find the number of passengers in each boat?

We know that:

- A.
- B.

We discovered that:

- C.

Equivalent number sentences:

5. 252 passengers are returning to the island. In each boat, there are 14 passengers. How many boats are returning?

We know that:

- A.
- B.

We discovered that:

- C.

Equivalent number sentences:

## Mansfield Island Answer Key

1. A. Twelve passengers in each boat will be returning to the island.  
B. Eight boats will make the trip.  
C. Ninety-six people will be returning to the island.

Equivalent number sentences:

$$8 \times 12 = 96 \quad 12 \times 8 = 96 \quad 96 \div 12 = 8 \quad 96 \div 8 = 12 \quad \frac{1}{8} = \frac{12}{96}$$

2. A. Fourteen passengers are in each boat.  
B. The total number of passengers is 126.  
C. Nine boats will be making the journey.

Equivalent number sentences:

$$9 \times 14 = 126 \quad 14 \times 9 = 126 \quad 126 \div 9 = 14 \quad 126 \div 14 = 9 \quad \frac{1}{12} = \frac{19}{126}$$

3. A. Two hundred eighty-eight passengers are making the return trip to the island.  
B. Twelve boats will make the trip.  
C. Twenty-four passengers will be in each boat.

Equivalent number sentences:

$$12 \times 24 = 288 \quad 24 \times 12 = 288 \quad 288 \div 12 = 24 \quad 288 \div 24 = 12 \quad \frac{1}{12} = \frac{24}{288}$$

4. A. Seventeen boats will make the trip back to the island.  
B. Two hundred twenty-one passengers will be returning to the island.  
C. Thirteen passengers will be in each boat.

Equivalent number sentences:

$$13 \times 17 = 221 \quad 17 \times 13 = 221 \quad 221 \div 17 = 13 \quad 221 \div 13 = 17 \quad \frac{1}{17} = \frac{13}{221}$$

5. A. Two hundred fifty-two passengers will be returning to the island.  
B. Fourteen boats will carry the passengers.  
C. Eighteen passengers will be in each boat.

Equivalent number sentences:

$$18 \times 14 = 252 \quad 14 \times 18 = 252 \quad 252 \div 18 = 14 \quad 252 \div 14 = 18 \quad \frac{1}{18} = \frac{14}{252}$$

Nombre \_\_\_\_\_ Fecha \_\_\_\_\_

## Mansfield Luxury Liner

Los pasajeros en el Mansfield Luxury Liner se estaban preparando para tener el día más feliz de sus vidas. Sin ningún aviso, el barco quedó varado. ¿Que les va a pasar a los pasajeros? ¿Habrá suficientes botes de rescate para llevarlos a tierra firme con seguridad?

En cada escenario, todos los pasajeros deben volver a tierra firme, y cada bote de rescate debe tener el mismo número de pasajeros. Después de completar la tarea, escribe todas las oraciones numéricas equivalentes, familias de factores y fracciones.

1. En el barco hay 432 pasajeros. Tienen 54 botes de rescate para volver a tierra firme. ¿Cuántos pasajeros viajarán en cada bote?
2. 12 botes de rescate llevan 17 pasajeros. ¿Cuántos pasajeros están siendo transportados a tierra firme?
3. Hay 456 pasajeros que están siendo transportados en 29 botes. ¿Cuántos hay en cada bote?
4. 38 botes están siendo usados para transportar todos los pasajeros del barco. Hay 23 en cada bote. ¿Cuántos pasajeros había en el barco?
5. Hay 1,431 pasajeros en el barco y 53 pasajeros fueron transportados en cada bote de rescate. ¿Cuál es el número total de botes de rescate?



### Isla Mansfield

Después de llegar a casa, muchos de los pasajeros se dieron cuenta que extrañaban la isla y decidieron regresar y empezar una comunidad allí. La misma compañía de botes fue usada para regresar los pasajeros a la isla. Cada bote transportará el mismo número de pasajeros en su viaje de regreso. Para resolver cada escenario, debes tener la siguiente información:

1. El número de pasajeros que regresaron a casa.
2. El número de botes que harán el viaje de regreso.
3. El número de pasajeros que viajarán en cada bote.

Encontrarás esto en cada escenario. Registra tu información escribiendo una oración para cada hecho. Tendrás que descubrir la información que falta, escribir una oración para esa información y calcular los datos para completar la tarea. Entonces escribirás todas las oraciones numéricas equivalentes, familias de factores y fracciones que van con cada problema.

1. Cada uno de los ocho botes están llevando 12 pasajeros a la isla. En total, ¿cuál es el número total de pasajeros que regresan a la isla?

Sabemos que:

- A.
- B.

Descubrimos que:

- C.

Oraciones numéricas equivalentes:

2. En cada bote hay catorce pasajeros, y el número total de pasajeros es 126. ¿Cuál es el número de botes que están haciendo el viaje?

Sabemos que:

- A.
- B.

Descubrimos que:

- C.

Oraciones numéricas equivalentes:

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3. 288 pasajeros están regresando a la isla en 12 botes. ¿Cuál es el número total de pasajeros en cada bote?

Sabemos que:

- A.
- B.

Descubrimos que:

- C.

Oraciones numéricas equivalentes:

4. Diecisiete botes están llevando 221 pasajeros a la isla. ¿Puedes encontrar el número de pasajeros para cada bote?

Sabemos que:

- A.
- B.

Descubrimos que:

- C.

Oraciones numéricas equivalentes:

5. 252 pasajeros están regresando a la isla. Hay 14 pasajeros en cada bote. ¿Cuántos botes están regresando?

Sabemos que:

- A.
- B.

Descubrimos que:

- C.

Oraciones numéricas equivalentes: