

## Module: Mathematics

### Lesson Title: It's All in the Game: Fractions

#### Standards for the Lesson

Florida Adult Basic Education Mathematics Standards
Use equivalent fractions as strategy to add or subtract fractions. (CCR.MA.ABE.5.3.4)

#### Interpreting the Standard

1 Standards	2 Skills Included in the Standard	3 Concepts Included in the Standard	4 Through a Particular Context	5 Cognitive Demand/Levels of Thinking	6 Sample Activity
Use equivalent fractions as strategy to add or subtract fractions. (CCR.MA.ABE.5.3.4)	use  add or subtract	equivalencies  fractions	Use of manipulatives or concrete representations of fractions	DOK 1	Games for the classroom that assist students in gaining automaticity through practice

#### Objectives of the Lesson

Students will:

- Add and subtract fractions with unlike denominators
- Change improper fractions into mixed numbers

#### Materials

- Fraction Cards
- Dice, number cubes, or dominoes
- **Handout A: Forwards and Onward (Comparing Fractions – 2 players)**
- **Handout B: It's In the Middle (Comparing and Ordering Fractions – 3 players)**

#### Instructional Plan

##### Overview

Classroom games and activities are an excellent way to develop mathematical skills through practice. Students become quickly bored with worksheets that are commonly used to practice basic skills. Games can be used in the adult education classroom to engage students in the learning process while having fun. This lesson provides different games that can be used in the classroom to assist students in developing automaticity when adding fractions.

### *Before the Lesson*

Prior to this lesson, make sure to have the different manipulatives available. Purchase dice for Activities 2 and 3. You can also use number cubes or dominoes for Activities 2 and 3. If using dominoes, students will select one domino and determine the fraction.

For Activity 1, create a set of fraction cards. You will need two of each fraction card. Index cards are the best with which to work because they are similar to regular playing cards.

- $1/2, 2/2$
- $1/3, 2/3, 3/3$
- $1/4, 2/4, 3/4, 4/4$
- $1/6, 2/6, 3/6, 4/6, 5/6, 6/6$
- $1/12, 2/12, 3/12, 4/12, 5/12, 6/12, 7/12, 8/12, 9/12, 10/12, 11/12, 12/12$

You will want to create enough sets to have a set for each team of students.

### *Process*

Introduce this lesson by sharing with students that today they are going to play games. Students will usually respond positively to this idea. Tell students that they are going to practice gaining automaticity when working with the addition of fractions.

Before you begin, review that a fraction represents a part (numerator) of a whole (denominator). Explain that an improper fraction will always have a value greater than one.

You will want to determine the amount of time that you will have students playing each game or you can use one game as a review of a concept that has been previously taught. Before students begin to play each game, model for them how the game is played.

#### **Activity 1**

Divide students into teams of 2, 3, or 4. Provide each team with a set of the fraction cards. Each person is dealt one fraction card up and one fraction card down. Players can look at the card turned down and decide whether they want another card or whether they want to pass. The goal is to be closest (without going over) to the whole number 2.

This activity requires that students be able to add unlike fractions and be able to change improper fractions to a mixed number.

#### **Activity 2**

Have students work in teams of two. Give each team one pair of dice. The object of the game is to see which member of the team is the first to score 20.

Each team member rolls the dice in order to get a fraction.

Example: 4 and 5 gives  $4/5$

Player A gets a point if the fraction is in lowest terms (like  $4/5$ )

Player B gets a point if it is not in lowest terms (like  $4/6$ )

The first player to reach 20 points wins.

### Activity 3

Have students work in teams of two. Give each team one pair of dice. The object of the game is to see which member of the team is the first to reach a total of 10.

Each team member rolls the dice in order to get a fraction.

Example: 4 and 5 gives  $4/5$

Each player must add his/her fractions each time the dice is rolled. For example, on the first roll Player A gets a 2 and a 3 ( $2/3$ ). On his/her second roll he/she gets 3 and 4 ( $3/4$ ). The player must then add  $2/3$  and  $3/4$  to get a total of  $1\ 5/12$  on his/her next roll, the player must add the new fraction to the last total and so on.

The players alternate rolls until one of the players has reached at least 10.

### *Sample Debriefing Questions*

- Why are denominators important when adding fractions?
- How do you create a common denominator? Provide an example of when you had to create a common denominator in one of the games?
- Were there any strategies that you used to help you win the game? What were they? Why do you think they worked?

### Modifications for Different Levels

The use of games in the classroom can be used at any level. Students who are at the beginning levels of learning about fractions can play one of the games in **Handout A: Forwards and Onwards** or **Handout B: It's In the Middle**. These games focus on ordering fractions and determining which fraction is largest or smallest.

You can also modify the games to have students practice subtraction of fractions. With subtraction, have a beginning number from which students subtract their fractions until one of the team members has reached 0.



