

# Darcy Jean's Math Jam

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### A. Introduction

Darcy Jean's Math Jam provides a fun way to help students of any age learn addition, subtraction, multiplication, division, and order of operations. The game also helps students combine mathematical and strategic thinking skills. The goal of the game is to create a series of different mathematical combinations, using different operators and numbers, to reach the "goal number", or the number the student must reach to complete a "combo". A combo is a sequence of numbers and operators that should be designed to reach the goal number, or the number generated by the program around which the student must create combos. At each level of difficulty, the student will need to complete different types and numbers of combinations in order to advance to the next level. With each level the student completes, another dance move will become visible to the student, or become "unlocked." The program consists of three primary categories of difficulty: Easy, Medium, and Hard. Within each of those levels is 20 additional levels of difficulty, for a total of 60 levels of difficulty.

### B. Objectives

1. To learn how to add and subtract numbers.
2. To learn how to multiply and divide numbers.
3. To learn order of operations.
4. To learn strategic thinking skills.

### C. Methods

This manual is designed to help teachers and students understand the basic concepts and game play of Darcy Jean's Math Jam. However, the simplest way to learn program game play and strategy is by experimenting with the program.

## Game Play

This portion of the Teacher's Manual will describe the primary aspects of game play. For more detailed information on each screen, please refer to the "Game Interface" section below.

In Darcy Jean's Math Jam, students will combine mathematical and strategic thinking skills. In order to unlock Darcy Jean's dance moves and advance through the program's levels of difficulty, the student will create mathematical combinations using sequences of numbers and operators to equal the goal number established at the beginning of each level.

The student should begin game play by choosing the level and category of difficulty. There are three primary categories of difficulty: Easy, Medium, and Hard. The student may select a category of difficulty by clicking on one of the green arrows labeled "Difficulty." The level may be selected by clicking on one of the green arrows labeled "Level". Once the student has chosen a category and level of difficulty, he or she should click on the "Play Game" button in the upper right corner of the screen.

Upon clicking on the "Play Game" button, the student will be taken to the Game Play screen. The primary area of game play is located in the right portion of the screen; the number and types of combos the student must attain to complete the level are located in the left portion of the screen, under Darcy Jean. The number the students must create combos to equal, the goal number, is located in the red area under Darcy Jean.



To begin game play, the student should look at the balls already onscreen. In this example, the student must create combinations of numbers in order to equal the number 3. The Next Ball, located in the green area in the lower right corner

of the screen, tells the student which operator or number will be launched next. In this example, the next ball is an addition sign. The student may launch this addition sign in two different ways. The student may launch it into an already existing operator, and the new ball will "overwrite" the previous operator. Or, the student may elect to make a specific sequence longer by launching the operator next to a number. For example, if the student elects to launch the addition sign onto the already existing combo of  $1 + 3 + 1$  (located in the middle of the game play area), the combo will then become  $1 + 3 + 1 +$ , and the next ball launched onto that combo should be a number. To launch a ball, the student should position the cursor over the black arrow that points to where the ball will be launched. Then, he or she may either click on the arrow or press the space bar.

While forming combos of numbers, the student should look at the number and types of combos the student must attain. In this example, the student must complete only one more combo of any type in order to unlock a dance move and advance to the next level of difficulty. Following is a brief explanation of each combo:

--The Sequence, denoted by three red balls, is the simplest sequence. It can be any length, as long as it equals the goal number.

--The Mammoth Math combo, denoted by an M, is simply a sequence of numbers and operators that is at least 5 balls in length.

--The Subtraction Action combo, denoted by a minus sign, is any sequence of numbers and operators that contains at least one subtraction sign.

--The X-Factor combo, denoted by a multiplication sign, is any sequence of numbers and operators that contains at least one multiplication sign.

--The D-Vision combo, denoted by a division sign, is any sequence of numbers and operators that contains at least one division sign.

--The Math From Above combo, denoted by two arrows pointing down, can be created by completing a sequence toward the top of the board and freeing up at least one math ball so that it falls toward the bottom of the board. If that falling math ball lands to complete another sequence, then a Math From Above combo has been achieved.

--The Criss-Cross Math combo, denoted by two lines crossing, can be created by completing a sequence horizontally and vertically at the same time.

--The Sign Me Up combo, denoted by a triangle, can be created by using all four operators to achieve the goal number.

While the student is playing, time will be counted down. The current time

remaining can be found in an orange space labeled "Time" in the left portion of the screen. The student will not run out of time; however, if there is time remaining when the student has completed the level of difficulty, he or she will receive bonus points.

When the student has completed a level, the program will prompt the student to enter the dance floor to see which dance move has been unlocked. Upon clicking "Yes," the student will be transported to the dance floor; upon clicking "No," the student will remain in the Game Play Screen.

At the dance floor, the student may view the dance moves that have been unlocked. The unlocked dance moves are highlighted; those that are still locked are "grayed out." If the student has just unlocked a dance move, that move's appropriate icon will flash. To see Darcy Jean perform an unlocked dance move, the student should click on the appropriate icon. To return to the game play screen, the student should click on the arrow button in the upper left corner of the screen.

At the Main screen, the student may access other features of the program. To view a complete description and explanation of game play, the student should click on the "Tutorial" button. To save a game already in progress, the student should click on the "Save" button; to load a previously saved game, the student should click on the "Load" button. Upon exiting the program, the student may be prompted to enter his or her initials in the "High Scores" screen; to view the high scores earned, the student may click on the "High Scores" button.

## Game Interface

This portion of the Teacher's Manual will describe the interface of the three major screens the student will encounter during game play. For more detailed information on how to play the game, please refer to the "Game Play" section above.

## I. Main Screen



At the Main screen, the student may access the tutorial, the dance floor, and the other primary aspects of game play. If the student would like to access a complete explanation of how to play the game, have him or her click on the "Tutorial" button in the upper left portion of the screen. The student may select a category of difficulty by clicking on one of the green arrows labeled "Difficulty" in the left portion of the screen. The level may be selected by clicking on one of the green arrows labeled "Level" in the left portion of the screen. To begin playing the game, the student should click on the "Play Game" button in the upper right portion of the screen.

To view the dance moves that he or she has already "unlocked," or made visible, the student should click on the "Hit the Dance Floor" button. To view the high scores, the student should click on the "High Scores" button in the lower portion of the screen. The current score can also be found in the lower portion of the screen. To save his or her game, the student should click on the "Save" button; to load a saved game, he or she should click on the "Load" button. To turn off the program's background music, the student may click on the music note button in the upper right portion of the screen; to access a general help message, the student may click on the question mark button. To exit the program, the student may click on the "Exit" button.

## II. Game Play Screen



This screen contains the primary aspects of game play. The right portion of the screen contains the primary game play area; to launch a ball onto a combo, the student should click on one of the black arrows that surround the board. The ball that will be launched can be found in the green area labeled "Next Ball." The number and types of combinations that the student must attain before advancing to the next level can be found in the left portion of the screen, under Darcy Jean. In this example, the student must create two "Subtraction Action" combinations and five other sequences before advancing to the next difficulty level. The student's current score, the time remaining, and the goal number are located under the types of combinations. The student's current level of difficulty can be found in the blue area labeled "Level." To turn off the program's background music, the student may click on the music note button; to access a general help message, the student may click on the question mark button. To return to the Main screen, click on the arrow button.

### III. Dance Floor



At this screen, the student may see which dance moves have been unlocked. The unlocked dance moves are highlighted; those that are still locked are "grayed out." If the student has just unlocked a dance move, that move's appropriate icon will flash. To see Darcy Jean perform an unlocked dance move, the student should click on the appropriate icon. To return to the game play screen, the student should click on the arrow button in the upper left corner of the screen. To turn off the program's background music, the student may click on the music note button in the lower left corner of the screen; to access a general help message, the student may click on the question mark button in the upper right corner of the screen.

## D. Tracking



The tracking function data is stored in a text file that can be accessed by most word processing programs. (Hint: For best results, change the font of your tracking output to a monospaced font, such as "Courier.")

The tracking function is automatically activated. You will be given the opportunity to access the tracking information when you exit the program. When the user is finished using the program, click on the "EXIT" button. On the next screen that appears, there are three options: SAVE, PRINT, and EXIT. To save the tracking information, click the "SAVE" button; when the dialogue box appears, name the file, and designate where you want to save it. To print the tracking information, click the "PRINT" button, and follow the directions of your operating system. To simply exit the program without saving the tracking information, click the "EXIT" button.

## E. Teaching Suggestions

As you can see from the above descriptions, Darcy Jean's Math Jam offers the user a unique opportunity to exercise and develop several different mathematical and strategic thinking skills. The ways you use the program will vary depending upon the individual user's needs and ability level. You should begin by determining the types of skills the student needs to exercise. Because differences among some of the difficulty levels are relatively subtle, you may need to review the problems in any given level to determine the best starting point for the user.

If you would like to introduce your student to basic addition, as well as the basic concept of how to launch numbers and operators, have him or her begin with Level 1 in the Easy difficulty category. At this level, the student will encounter only small numbers and the addition operator. As the student progresses

through each level of difficulty, the numbers get higher and other operators will be introduced. If you would like the student to begin at a more advanced level, have him or her begin at Level 1 in the Medium difficulty category; at this category of difficulty, the student will use two-digit numbers and more complex operators. The number and complexity of the combos required to advance to the next level of difficulty are also more difficult. At the Hard level of difficulty, the student will be asked to reach larger goal numbers, with more complex combos required to complete a level. It is recommended that the student begin each category of difficulty at Level 1; that way, he or she may unlock all of Darcy Jean's dance moves. However, the student may start at any level.