**“Bull’s-Eye”: The Target Number Dash**

**Grade Level:**

5th Grade

**Objective:**

By the end of the lesson, the students will be able to use parentheses and brackets in an equation to make the equation true.

**Common Core Standard:**

5.OA.1. Use parentheses, brackets or braces in numerical expressions and evaluate expressions with these symbols.

**Materials:**

* Deck of number cards per group
  + 3 each of numbers 1-4
  + 4 each of numbers 7-10
* Instruction sheet

**Procedure:**

Introduction:

Yesterday we talked about the distributive property and what it means when there are parentheses in a problem. We also know from the order of operations that if there are parentheses in a problem we do the work inside of them first. Today, I’m going to introduce a new symbol to you. They look like this [ ]. *Write on board.* Discuss with a partner and see if you can come up with an answer as to what we use this symbol for. *Allow discussion*. We are going to go pair by pair and I want you tell me and your classmates what you came up with. *Allow each pair to share. Do not tell them whether or not they are correct*. Good, now I am going to put these symbols into a problem and I want you to decide if you still agree with your original answers. *Write [(3 + 2) × (6 - 4) + 2] × 4+2 on the board and allow students to discuss*. Give me a thumbs-up if you still agree with your answer. Give me a in the middle if you changed your answer a little. If you were a group that changed their answer, would you please share with us what you changed it to and what made you decide that your first answer needed a little tweaking? *Allow for discussion*. Now, after everything we’ve hear from our classmates, who thinks they can give me an explanation to what this symbol is used for. *Allow for an answer.* Great, this symbol is called brackets and they are used for just what you guys all came up with. They are used as another way to show what work needs to be done before you start the rest of the order of operations. Let’s look at the example I wrote on the board. What would I do first*? Answer: 3+2=5 and then 6-4=2.* What would I do next*? Answer: Multiply 5 x 2=10. Then add 2.* Why do I do that instead of 4+2? *Answer: The 10 +2 is inside the brackets so that needs to be done before we can multiply by 4 or add the two because of the order of operations.*

Task: To practice using parentheses and brackets we are going to do an activity called Target Number Dash. You will break up into groups, picked by me, of 3 or 4 (number varies based on class size). You are going to get a deck of number cards. The group will turn up 5 cards in the middle of the table. Then a sixth will be placed underneath the first row. Each group member will work with the five cards and using all the cards, will use addition, subtraction, multiplication, division and any combination of them, parentheses and brackets to get to the sixth card that was drawn. This card is going to be the target card. This is the answer you are aiming for. There is an example of how this can be done on the instruction sheet. You have to write down your final solution. The group will work for about 10 minutes. If a member finds a solution and it works, then they should work to find more possible solutions. After that time, then I will say “TARGET!” and the group members will take turns explaining their solution to the group. The other members may need to do the problem on their own to make sure the solution works. You will be trying to get as many correct solutions as possible as a group. Each group will add up the amount of solutions they found, not counting doubles. The group with the most solutions wins! *Let students work for at least twenty minutes total minutes.*

Closure: After the time is up, have each group come up to the front of the class and present their findings. They should tell the class what numbers they worked with, how many solutions they found, and tell the order in which you would solve a few of their solutions.

**Assessment:**

First Assessment: Students reflecting on their answer to the brackets, using their thumbs.

Second Assessment: Teacher will walk around and watch in on the groups. The teacher may stop and ask questions as the students work.

Third Assessment: At the end of class, the teacher will write 5 numbers on the board and a target number. The students will write down these numbers in their math journal and for homework they will work out the problem just like in the game Target Number Dash. The numbers may be pre-thought out so the teacher has possible solutions. The students will have to show the teacher their response the next day.

**Differentiation:**

Up:

* Use more numbers to get to the target.
* Find 2 possible solutions.

Down:

* Use less numbers to get to the target.
* Don’t use as many bigger numbers.

**Justification:**

This lesson involves teaching for understanding because it encompasses many of the things we have learned in class. One thing that is important for teaching with understanding is communication. There are many opportunities for students to talk about the processes they are using as well as justifying where their answers are coming from. They talk with their partners about what brackets are, they have to explain their solutions in the game, and they may have to answer the teacher’s questions throughout the lesson. Another example of how this lessons shows teaching for understanding is because it allows the students to explore the brackets ([ ]) before the teacher tells them what they are and what they are used for. This is allows the students to develop their own learning with the teacher as an aid, not the main knowledge supply.