# Number Sense/Algebra/ Geometry Institute Summer 2010

**Lesson Plan 1:** Function Tables

**Faculty Name**: Rachel Allhands

**School:** Kirkpatrick Elementary

**Grade Level:** 4th

## Teaching Objective:

Mississippi Mathematics Frameworks: 4th Grade: Objective 2C: Construct Input/Output function tables and generalize the rule using words, models, and symbols.

Institute framework: Given a rule, complete a function table.

## Instructional Activities:

- The teacher will read the Dr. Seuss book "Sneeches". TTW explain to students that the book is going to tie into the math lesson for the day.

- After the book, discuss with students what happened to the Sneetches as they went into the machine? (The Sneeches without stars on their bellies went in and got stars and visa versa.)

- Pose the following question for students: "Can you think of anything in math that is similar to a machine?" Allow the students to think and share for a few minutes.
    - Students might suggest several possibilities. Some of the possibilities include input output charts, tables, graphing data, converting measurement information, etc.

- Explain that today we will be talking about function tables. Tell the students that they should think of a function table like a machine. The numbers go in, something happens in the machine, and a new number comes out. Explain that the line dividing the input side from the output side is where the "action happens", or the rule.

- Remind the students that we have already talked about patterns, so this should be a good review for that as well.

- Tell the students that we are first going to model using patterns and relate this information to function tables. Give pairs of students a set of color tiles. Give each pair of students construction paper. Tell the students to turn the construction paper long ways and draw a line down the middle, as shown below.

- Explain that the left side of their paper is the “input” side. This is where our tiles will go in. Tell the students that this is a magic machine that doubles everything that goes inside. Explain that the middle line is where the magic happens. Demonstrate for students that once an object crosses the middle line, the output is made.

- On the overhead, put 2 color tiles into the “machine”. Remind the students that the middle line is where the object will double. Place 4 color tiles on the output side.

- Allow the students to work with their partner for about 5 minutes to explore using their color tiles.

- TTW now explain that we are going to turn our modeling into an actual table. This table is called a Function Table. Show students a blank copy of the function table on transparency. (Attachment 1) Show the students how we can input the information we just found into the table. On the input side of the chart, write the number 3. Ask the students what happens when 3 color tiles were put into the machine. The students should answer that the number was doubled. Therefore, the output number would be 6. Fill in all of the spaces to the chart with the students, allowing the students to decide on the input number.

- Explain that now the students will create function tables for their classmates to figure out. Give each student blank construction paper. Tell the students to first draw the outline of the table that looks like the blank one that we had on the overhead. Tell the students to leave room at the bottom of their construction paper for someone to fill in their rule. The blank document should resemble attachment 2.

- Tell the students that before they can create their table, they must know what kind of a machine they want to have (they must know what rule they will use). Explain that the more complex the rule, the harder it will be for other students to figure out their function table. Students must get their rule approved before creating their table.

- Once the students know what rule they will be using, tell them to think of 5 input numbers to put into the input side (one number in each box). Instruct the students to fill in the first, second, and last output numbers using their own rule. (This should leave outputs 3 and 4 blank)

- Once the table is created, the student should decorate their paper. After all students have created their tables, allow them to exchange them with their classmates and solve each others.

Do not allow the students to write on each other's charts. Instead, provide them with answer sheets to fill in. (Attachment 3)

- After students have complete several of their classmates tables, have the students come back together as a whole group and discuss what they just learned.

- I usually take the students tables, number them, laminate them, and hang them in the hallway with the headline "Are You Smarter Than a Fourth Grader?". I Velcro a pencil to the wall. I tape 2 ziploc bags to the wall, one for blank answer sheets and one for completed answer sheets. We invite the 5th grade students to solve our tables when they have time. The students feel super confident when some of the older students have trouble solving their tables.

## Materials and Resources:

- **Sneetches by Dr. Seuss**
- **Color tiles**
- **Construction paper**
- **Overhead color tiles**
- **Transparency of blank function table**
- **Crayons to decorate**
- **Velcro**
- **Tape**
- **Ziploc Bags**
- **Answer sheets**
- **Teacher Created Resources (Attachments 1, 2, and 3)**
- **http://www.mde.k12.ms.us/acad/id/curriculum/math/2007_framework/2007%20MS%20Math%20Framework%20Competencies%20and%20Objectives%209-18-07.pdf**
- **http://www.mde.k12.ms.us/acad/id/curriculum/math/2007_framework/2007%20MS%20Math%20Framework%20Teaching%20Strategies.pdf**

## Assessment:

- **Observe the students as they complete each other's charts. Allow the students to do peer evaluation by checking to see if their classmates correctly filled in the numbers to their function table. Require that each student complete at least 5 different tables from their classmates.**

| Input | Output |
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Attachment 1

Attachment 2

| Input | Output |
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| | |

**Rule:** _____

# ANSWER SHEET

Name:_____

Homeroom Teacher: _____

Table number: _____

Rule: _____

Missing Values: _____ and _____


# ANSWER SHEET

Name:_____

Homeroom Teacher: _____

Table number: _____

Rule: _____

Missing Values: _____ and _____

# ANSWER SHEET

Name:_____

Homeroom Teacher: _____

Table number: _____

Rule: _____

Missing Values: _____ and _____

# ANSWER SHEET

Name:_____

Homeroom Teacher: _____

Table number: _____

Rule: _____

Missing Values: _____ and _____


Attachment 3