

# Lessons

## BCSE Lesson Plan

### Grade 3

#### Subject: Math 4.1

#### **Standards (New York State Standards & Common Core)**

NYS: See NYS Standards Chart\*

CCSS: SMP1, SMP2, SMP4, SMP5, SMP6, SMP7, 3.OA.1, 3.OA.3, 3.OA.4, 3.OA.5, 3.OA.7, 3.OA.8

#### **Objective: Multiples of Equal Groups**

- ❖ To review multiplication and equal groups and to provide opportunities to solve and write number stories involving equal groups using diagrams.

#### **Key Concepts**

- ❖ Use facts to solve multiplication stories.
- ❖ Use strategies (counters, pictures, or arrays) to compute facts through  $10 \times 10$ .
- ❖ Use multiplication diagrams to model number stories involving equal groups

#### **Materials/Resources**

- ❖ Math Journal 1, p.79
- ❖ Student Reference book, p. 66
- ❖ Math Masters p. 419, 406
- ❖ Counters
- ❖ Math Partnerships (List posted) – established in beginning of year
- ❖ High achieving math scholar with low/on grade level scholar

#### **Motivation**

- ❖ Read “Each Orange Had 8 Slices: A Counting Book”

### Mini-Lesson/Direct Instruction

Math Message: You have 4 packages of pencils. There are 6 pencils in each package. How many pencils in all?

Explain to scholars that they will use a multiplication/division diagram (graphic organizer) to complete each multiplication number story. Teacher will demonstrate for scholars, that just as in reading we underline key words, we do the same in math. Next, the teacher will model for scholars how to put each piece of information into the correct part of the diagram and what the key words are (numbers).

- ❖ Remind scholars that multiplication is repeated addition and to NOT get tricked by the addition words they may see (total, in all).
- ❖ Tell scholars that when they see the word “per” in a diagram, it means each.

Fill in the following information for the Math Message. How many...

- ❖ Packages?
- ❖ Pencils PER Package?
- ❖ Pencils in all?
- ❖ Number Model:  $4 \times 6 = 24$

### Guided Practice (Both teachers circulate around classroom at this time)

Give scholars another number story:

Ms. Tomaselli reads for 2 nights in a row. She reads 6 pages each night. How many pages does Ms. Tomaselli read in all?

Invite a scholar to the board and ask him/her what the key words are and where each piece of information should go on the multiplication diagram. Have the scholar explain how they knew where to put each piece of information in the diagram.

How many...

- ❖ Nights?
- ❖ Pages PER Night?
- ❖ Pages in all?

$$\begin{array}{r} \text{M} \\ 6 \end{array} + \begin{array}{r} \text{T} \\ 6 \end{array} = 12 \text{ Pages in all}$$

Number Model:  $2 \times 6 = 12$  pages in all

Scholars will complete Math Journal p.79 #2-3 with their math partners. They must remember to use their multiplication diagrams or draw an illustration to find their answers. Teachers will walk around to check for understanding or assist and struggling scholars.

### **Independent Practice**

Scholars must complete the first multiplication number story on MJ p.79 independently. Teachers will continue to walk around to check for understanding. When a scholar has correctly filled in the diagram, written a number model and found their answer with the correct unit, they may raise their hands and the teacher will check them with a stamp/pen. They may then join their math partner to finish the activity. When scholars have finished number 1, they may turn and talk to their partner to see if there are other ways they could have solved the MJ problems.

### **Share/Reflection**

Scholars will go back to their seats. Teacher will pick from the cup and choose 2 scholars to come up to the board and complete the Math Journal problems. Second teacher will pull struggling scholars in the back or somewhere private to re-teach if necessary. If not, teacher will walk around to monitor on task behavior. Scholars will explain how they found their answers while their classmates check their work for errors.

## Modifications (See Differentiation Chart)

1. Acting out the number stories as they complete them in their math journal.
2. Manipulatives/Diagrams
3. Heterogeneous partnership
4. Using *Math Masters* p.86, scholars will make equal groups of objects; have children make boxes that have the same number of candles.
5. Have scholars build a Word Bank which they write multiplication words in the bank with the definition and a picture to go along with the word. Scholars will use words such as: *products, multiples, factors*.

## Extensions

Read *Each Orange Had 8 Slices* by Paul Giganti to introduce the concept of a number story at the beginning of the lesson. Have students make up at least one multiplication number story using *Each Orange Had 8 Slices* as a guide. Use *Math Masters* p.407 as a template.

- ❖ Scholars will form teams (equal groups) when playing P.E. – 28 scholars – 4 groups of 7

## Enrichment

Give Scholars a multiplication number story in which they need to work backwards (use division).

## Assessment(s)

Exit slip with Multiple Number Story: There are 5 families living in a house. Each family member uses 2 towels. How many towels do they use in all?

## Homework:

Home Links 4.1

Practice Multiplication Facts

After each lesson, an exit slip was given to scholars to check for understanding. The exit slips consist of a few questions and is collected and reviewed at the end of the lesson. If the scholars mastered the days' lesson, their knowledge would be demonstrated throughout the *exit* slips. If majority of the scholars mastered the days' lesson, we would continue the unit and move on to the next multiplication lesson. If scholars did NOT master the days' lesson, we would re-teach the next day. The re-teach day would consist of new ways of teaching the skill or giving the scholars another days practice. If there is a small group (5-7) of scholars who did not seem to master the daily skill, instead of re-teaching the entire lesson again, we would pull this small group during lunch, prep or at the end of the day to reinforce the skill. Our planning was based on the scholars' needs and changed frequently depending on their performance.

**BCSE Lesson Plan**  
**Grade 3**  
**Subject: Math 4.2**

**Standards**

NYS: See NYS Standards Chart\*

CCSS: SMP2, SMP4, SMP5, SMP6, SMP7, 3.0A.1, 3.0A.3, 3.0A.4, 3.0A.5, 3.0A.7, 3.MD. a, 3.MD.7b, 3.MD.8

**Objective: Multiplication Arrays**

- ❖ To provide opportunities to use arrays, multiplication division diagrams and number story models to represent and solve multiplication number stories.
- ❖ Model the turn-around rule for multiplication.

**Materials/Resources**

- ❖ Math Journal p.81 Home Links
- ❖ SRB p.67
- ❖ Manipulatives
- ❖ Discovery Ed Video

**Math Message**

There are 24 trombone players in a big parade. Use an array to show how the members of this band can stand in equal rows.

Log onto [www.everydaymathonline.com](http://www.everydaymathonline.com) and read SRB p. 67 together- Multiplication Arrays.

**Guided Practice**

Display Mult/Div Diagram and model for scholars how to take the information from the number story and apply it to the math organizer Next, model how to form a 4 x 6 array and count the arrays aloud with the scholars . Discuss with scholars that they can solve either way,

however counting arrays can sometimes lead to making a mistake (re-counting, missing one). Share with scholars that they can lightly cross out or circle arrays as they count them to avoid this.

Rows	Players per row	Total Trombone Players
Scholars will draw arrays in their notebooks or use manipulatives (counters) to solve simple multiplication number stories with their math partner.		
Scholars will repeat directions/steps taken for math message using these numbers stories.		
<ul style="list-style-type: none"> <li>❖ 32 crayons, 8 crayons per box - How many crayons per box?</li> <li>❖ 6 shoe boxes , 1 PAIR of shoes per box</li> <li>❖ 5 rows of chairs, 3 chairs per row</li> <li>❖ 40 books , 8 books per shelf- How many books PER shelf?</li> <li>❖ 2 cartons of eggs , 12 eggs per carton</li> </ul>		

Choose a scholar to volunteer to draw the array on the board showing how he/she arranged the band members. Ask others to draw different arrangements (6 by 4, 4 by 6, 12 by 2, 2 by 12, 8 by 3 , 3 by 8) . Explain to scholars that an **array is a group of objects arranged in rows and columns**. Each row has the same number of objects and each column has the same numbers of objects. As scholars share their answers, the teacher will also ask what the turn-around facts are.

### Mini-Lesson/Direct Instruction

Teacher will draw an array not mentioned by the scholars.

Teacher will then display a multiplication/division diagram and have a volunteer fill in the known quantities.

Teacher will draw attention to the fact that the numbers do not have the same units of labels as they do in addition and subtraction stories.

Ask scholars to write a number model for the array ( $4 \times 6 = 24$ ).

Choose a scholar out of the cup to complete the first 2 multiplication/division diagrams on the board.

Guide scholars to explain *how* they received their answer. Ask scholars to create a number model for each finished mult/div diagram as well as for the turn-around fact. Remind scholars to draw a picture to double check their work.

### **Independent Practice**

Scholars will use arrays (counters) and mult/division diagrams to solve multiplication number stories on Math Journal p.81 with math partner.

### **Share/Reflection**

Review Math journal page on SmartBoard.

Distribute exit slip.

Scholars will complete the problem by drawing arrays.

7 Backpacks, 5 books in each backpack.

How many books in all?

### **Sing Along**

Scholars sing along to x0, x1, and x2 multiplication album

### **Modifications**

See Differentiation Chart

### **Assessment(s)**

- ❖ Informal observation of mult/div diagram completion, multiplication knowledge
- ❖ Exit Slip: Multiplication Number Story

### **Homework**

Home Links 4.2

Practice Multiplication Facts



**Modification**

See differentiation chart.

1. Manipulatives/Diagrams
2. Have scholars build arrays with counters in order to solve multiplication number stories.

**Extension**

Scholars will be given a list of products and have students work backwards to find the factors that correspond to it.

**Enrichment**

Scholars create arrays when warming up for P.E. class.

**BCSE Lesson Plan**  
**Grade 3**  
**Subject: Math 4.3**

**Standards**

NYS: See NYS Standards Chart\*

SMP2, SMP5, SMP6, SMP7, 3.OA.1, 3.OA.2, 3.OA.3, 3.OA.4, 3.OA.6, 3.OA.7

**Objective: Equal Shares and Equal Grouping****Materials/Resources**

- ❖ Math Journal, ph. 84
- ❖ Pennies or Counters
- ❖ Apples
- ❖ Math Matters, p.91

**Motivation**

The teacher will read the story “The Doorbell Rang” by Jill Hutchinson. After the read aloud, scholars will complete Math Masters p. 91. The page correlates with the read aloud and asks students to draw pictures based on the number stories found in the story.

**Mini-Lesson/Direct Instruction**

Instruction will begin by explaining to scholars that everyone in their life has shared something before, whether it was a toy or a pencil in class. In math, the operation of division uses a similar concept called equal sharing and equal groups to get answers.

The teacher will explain that there are different ways for solving equal sharing and equal grouping number stories. One way would be to count out the number using a picture, you can use your knowledge of multiplication to form a number model or you can use a division number model.

Display the number story: *Leah and Matthew share 14 pennies equally. How many pennies does each child get?* The teacher will tell scholars that counters are a helpful way to solve division number stories. The teacher will discuss with the class that there are many ways to solve division number stories such as counting up by drawing a picture, thinking in terms of multiplication  $2x?=14$ , or using a division number model  $14/2=7$  to get an answer.

Sometimes, number stories will be written using equal shares or they will be written using equal groups. Display the number story: (Each child has 5 pennies. There are 30 pennies total. How many children have pennies?) Tell scholars that they can use the same strategies as done previously with equal sharing problems. Scholars can count up to 30 by drawing 5 pennies at a time to see how many groups will be needed. They can also think in terms of multiplication:  $5x?=30$  or using a division number models:  $30/5=6$ .

Teacher will remind scholars that sometimes numbers are not shared equally or separated into equal groups. The quantity left over is called the remainder and the term is used in division problems.

### **Guided Practice**

Teacher will display multiple equal sharing and equal grouping number stories on the SmartBoard. Scholars will have to answer the problem and state the remainder.

- 12 pennies, 3 children
- 20 pennies, 6 children
- 24 pennies, 8 pennies per child
- 16 pennies, 4 pennies per child

Teacher will monitor scholars' work and strategies being used to solve each number story. Several scholars will come up to the board and share their strategies with the classmates.

## Independent Practice

Scholars will work with their math partner to answer equal share and equal group number stories in their math journal. Scholars will be given counters to model number stories.

## Share/Reflection

Share strategies on how they get their answer and write on the SmartBoard.

Partnerships will be chosen to share and write their answers on the SmartBoard as well as discuss how they received their answers. Scholars will then complete equal shares exit slip.

## Sing Along

Scholars sing along to x3, x4 multiplication album.

## Modifications

See Differentiation Chart

1. Use Multiplication flash cards to help solve division problems.
2. Have students read *The Door Bell Rang*. While reading, discuss how division is illustrated in book and discuss division words like *share*, *split*, *divide*, and *divide equally*. Use fraction manipulatives if possible. Discuss their meanings as well. After they read, have scholars complete Math Masters p.91 using the book *The Door Bell Rang*.

## Extension

Scholars will complete a division activity in which they solve division word problems with 3 digit numbers divided by 1 digit numbers and with remainders/leftovers.

## Assessment

- ❖ Informal observation of math partnerships and completed activity

- ❖ Exit Slip

### **Homework**

- ❖ Home Links 4.3
- ❖ Practice Multiplication Facts

**BCSE Lesson Plan**  
**Grade 3**  
**Subject: Math 4.4**

**Standards**

NYS: See NYS Standards Chart

SMP2, SMP4, SMP5, SMP7, 3.OA.2, 3.OA.3, 3.OA.4, 3.OA.6, 3.OA.7

**Objective**

Scholars will be able to correctly answer division number stories with arrays, multiplication/division diagrams, and number models.

**Materials/Resources**

- ❖ Multiplication/Division Diagram Counters
- ❖ Math journal, p.86
- ❖ Brain POP video: Equal Shares

<http://www.brainpopjr.com/math/multiplicationanddivision/makeequalgroups/preview.weml>

**Motivation**

The teacher will display the following problem on the SmartBoard:

12 pennies are shared equally by 4 children. How many pennies does each child receive?

Scholars will answer the problem in their notebooks. The teacher will call on 4 students to act out the problem using EDM pennies.

**Mini-Lesson/Direct Instruction**

Display a multiplication/division diagram on the SmartBoard. Use the math message problem: *12 pennies are shared equally by 4 children* to model how to fill in the numbers correctly on the diagram. Teacher will explain to scholars that the multiplication/division diagram is used to

get an understanding of which operation to use for each number story. Remind students that when they are looking for the total number, they will use multiplication. When scholars are looking for the first two parts of the diagram, they will use division to solve the number story. Model the division number model for the math message. The teacher should introduce the three parts of a division problem:

Dividend - total before sharing.

Quotient - division answer

Divisor - number of equal parts or the number in each equal part

Scholars will watch a video on equal shares:

<http://www.brainpopjr.com/math/multiplicationanddivision/makingequalgroups/preview.weml>

### **Guided Practice**

Play Division Arrays SRB p.282.

Teacher chooses 2 scholars to model one game round with.

Scholars then gather game materials and play with their math partner (heterogeneous grouping).

### **Independent Practice**

Independently, scholars will answer multiplication and division number stories using the multiplication/division diagram. In their notebooks, scholars will include the diagram, number model, and answer including the units.

### **Share/Reflection**

Scholars will share strategies on how they got their answers and write them on the SmartBoard (arrays, diagrams, etc.)

### **Sing Along**

Scholars sing along to x3, x4 multiplication album.

## Modifications

See Differentiation Chart

1. Write up the rules of the game and provide the rules for scholars to refer to when needed.
2. Have students build a Word Bank in which they write division words in the word bank, the definition, and a picture to go along with the picture. Scholars will use words such as: *quotient, remainder*.

EX:

Word	Definition	Picture

## Extension

Scholars will complete *Finding the Mystery* number on Math Masters, p.94.

## Assessment(s)

- ❖ Informal observation of Division Arrays game.

## Homework

- ❖ Home Links 4.4
- ❖ Practice Multiplication Facts



## BCSE Lesson Plan

### Grade 3

### Subject: Math 4.5

#### **Standards**

NYS: See SNY Standards Chart

CCSS: SMP2, SMP4, SMP5, SMP6, SMP7, 3.OA.5, 3.OA.7, 3.OA.9, 3.NBT.2

#### **Objective: Multiplication Fact Power Shortcuts**

- ❖ Practice multiplication facts.
- ❖ Identify patterns in skip counting by 2s, 5s, and 10s.
- ❖ Use arrays to represent turn-around multiplication facts.
- ❖ Use the Commutative Property of Multiplication (the turn-around rule), the Multiplicative Identity, and the Zero Property of Multiplication to generate multiplication facts.

#### **Materials/Resources**

- ❖ Nine times quickie handout
- ❖ Flashcards
- ❖ iPad (Multiplication genius app)
- ❖ Manipulatives-counters
- ❖ Mad Minutes
- ❖ Discovery Ed Video – NINE’S Trick
- ❖ Brain pop – X by 0 or 1

#### **Motivation**

Scholars have learned different strategies such as repeated addition, making diagrams, and drawing pictures to solve multiplication problems, but now they must memorize the facts. If scholars have not mastered basic facts, then they will be unable to move on to more complex problems such as 2 digit by automaticity in an engaging way.

**Math Message**

$7 \times 3 = 21$  is a multiplication fact. Write 5 other multiplication facts.

**Math Message Follow-up**

Have children call out multiplication facts, with or without the products, while you write them on the board. Use both horizontal formats (with the product to the left and the right) and vertical formats. Tell children that the symbols  $*$  and  $\cdot$  are sometimes used to show multiplication.

**Mini-Lesson/Direct Instruction***The Multiplication by 1 Shortcut*

If 1 is multiplied by any number, the product is that number (Multiplicative Identity).

\*There are 8 flowers in a pot. You have 1 pot. How many flowers do you have?

*The Multiplication by 0 Shortcut*

If 0 is multiplied by any number, or any number is multiplied by 0, the product is 0 (Zero Property of Multiplication).

\*There are 10 cookies in a box. You have 0 boxes. How many cookies do you have?

*The Turn-around Shortcut*

Illustrate the turn-around shortcut (Commutative Property of Multiplication) by writing several fact phrases for small numbers, such as  $4 \times 3$ , on the board. Pair each fact with its turn around, or commutative partner.

### *The Familiar Facts Shortcut*

Tell children that the 2s, 5s, and 10s facts are simply counts by 2s, 5s, and 10s.

### *The 9 Times Quickie*

1. Hold your hands in front of you with your fingers spread out.
2. For  $9 \times 3$ , bend your third finger down. ( $9 \times 4$  would be the fourth finger, etc.)
3. You have 2 fingers in front of the bent finger and 7 after the bent finger.
4. Thus the answer must be 27.
5. This technique works for the 9 times tables up to 10.

Scholars will watch the Discovery education video to help them with the NINE'S Trick.

<http://www.discoveryeducation.com/?returnURL=player%2Ediscoveryeducation%2Ecom%2Findex%2Ecfm>

### **Guided Practice**

Teacher will guide scholars through several examples of each shortcut. Scholars will watch a short brain pop video on multiplying by 0 or 1. Teacher will then go around the room (around the world) and randomly call on scholars to answer quick zeros and ones math drills.

<http://www.brainpopjr.com/math/multiplicationanddivision/multiplngby0or1/preview.weml>

- ❖ There is 1 ring in each box. You have 6 boxes. How many rings do you have?
- ❖ There are 0 cookies per box. You have 10 boxes. How many cookies do you have?

Ask volunteers to give one multiplication fact. Ask volunteer to give the turn-around fact. (repeat 3 times)

Include square numbers, such as  $3 \times 3$  and  $5 \times 5$ , and point out that the turn-around fact for a square number is the same as the original fact.

Have the class recite in unison the 2s, 5s, and 1/0s facts in order.

Point out the following patterns:

The products of 2s and 10s facts are always even numbers.

The products of 5s facts always end in 0 or 5.

The products of 1/0s facts always end in 0.

### **Independent Practice**

Scholars will work in centers according to the facts being memorized.

A. 0s and 1s- partners will take turns drilling each other with flash cards.

B. 2s – teams of 4 scholars will take turns practicing facts on iPad app called Multiplication Genius. There will be two teams of 4 playing against each other to see who does the most drills in the same amount of time.

C. 5s and 1/0s center will consist of multiplication war between partners. Each partnership will have a set of 24 cards. Scholars will have cards face down and will take turns turning cards over.

Whoever gets the answer first will take the card. First person to have all cards wins.

D. 9s center will have handout with 9 times quickie trick. Partners will take turns practicing how to use their fingers to practice the 9 facts.

### **Share/Reflection**

Teacher will ask for volunteers to share their favorite shortcut or center and to explain why. Scholars will also be given an exit slip with 4 of each times table fact that was taught in this lesson.

**Sing Along**

Scholars sing along to x3, x4 multiplication album.

**Modifications**

See Differentiation Chart.

Scholars will use a geo board to build arrays and complete math journal pages.

**Extension**

Scholars will write fact shortcuts that they already know and explain their shortcuts on paper.

**Enrichment**

Children explore new patterns and create and explain their own fact shortcuts.

Scholars may also create rhymes or songs to memorize facts.

**Assessment(s)**

- ❖ Scholars will be assessed informally through observation.
- ❖ Scholars will also be given an exit slip (The Nines Trick) that is representative of the material taught.
- ❖ Mad Minutes 10, 1, 2, & 5, 10, 11

**Homework**

- ❖ Begin writing multiplication song or rap to be presented to the class
- ❖ Home Links 4.5
- ❖ Practice Multiplication Facts

## BCSE Lesson Plan

### Grade 3

### Subject: Math 4.6

#### **Standards**

NYS: See NYS Standards Chart

SMP2, SMP3, SMP5, SMP6, SMP7, 3.OA.2, 3.OA.4, 3.OA.5, 3.OA.6, 3.OA.7, 3.OA.9

#### **Objective: Multiplication and Division Fact Families**

- ❖ Scholars will be able to use fact triangles to generate multiplication and division fact families.
- ❖ Scholars will also be able to explore the inverse relationship between multiplication and division.

#### **Materials/Resources**

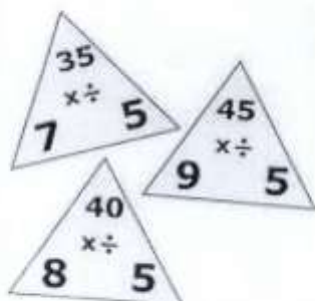
- ❖ Math journal activity sheets with fact triangle templates (blank and with pre-printed facts up to 12x12), p.101
- ❖ Construction paper
- ❖ Scissors

#### **Motivation**

Yesterday we discussed the importance of memorizing basic multiplication facts. We must learn these facts in order to move onto higher level problems. Multiplication and division fact triangles are just like the addition and subtraction fact triangles that we did in the previous unit. Creating fact triangles to determine fact families will help scholars solidify their knowledge.

## Mini-Lesson/Direct Instruction

Fact Triangle Example:



### Math Message:

Scholars will be reminded of what fact triangles and fact families are by creating both of these items for an addition/subtraction question.

Write the +, - fact family for the numbers 5,6, and 11. Draw a fact triangle as well.

Teacher will review math message by asking for volunteers. Teacher will remind scholars that when we do fact triangles, the largest number, or sum in addition/subtraction fact triangles, always goes on top of the triangle (draw pictures). The other two numbers can be placed on either side of the base. Teacher will also review that there must be 4 members in the fact families in order for it to be complete. Once teacher check to see if scholars completed this review question correctly, he/she will begin to model.

Teacher will model how to write fact families when given a complete fact triangle (5,3, and 15) "I see that the number 15 is at the top of my triangle. In addition, the number at the top is called the sum, but I think I remember that the answer you get when you multiply is called

the product. The number 15 has to be my product so it belongs on one side of the equal sign. Now I have 5 and 3. This tells me that my first fact family is  $5 \times 3 = 15$ . I also know that turn around facts have the same product so my next fact must be  $3 \times 5 = 15$ . I know that the opposite of multiplication is division so my next two facts must be division. If  $3 \times 5 = 15$ , then  $15/3$  must equal 5 and I know my turn around fact will be  $15/5 = 3/.$ "

### **Guided Practice**

Teacher will place another fact triangle example on the board. This triangle will be missing a number. Scholars will be shown a triangle with 4 and 24. Teacher will ask students what strategies we can use to find the missing number. Scholars have done word problems and other examples similar to this, therefore, they should know some strategies already. Teacher will guide them to use their multiplication table above all other tools.

Scholars will be reminded that based on the rules of fact triangles, the product is on top. Given this,  $4 \times \text{some number}$  must equal 24. Using the multiplication table, we see that if we begin on the horizontal 4 and go down until we see 24 and then left, we will get 6. Teacher will then ask for volunteers to write the 4 fact families.

### **Independent Practice**

Scholars will be asked to create "fact houses" by cutting out and completing fact triangles. Each triangle will be glued to the top of the construction paper to form a "roof." The fact families will be written directly below the fact triangle roof. Scholars will complete at least 6 fact houses.

### **Share/Reflection**

Scholars will share their work and 3 volunteers will be asked to draw one of their fact triangles on the SmartBoard and call on fellow



scholars to write the 4 facts that correspond. Scholars' work will be used as an informal assessment for this lesson.

### **Sing Along**

Scholars sing along to x5, x10, x11 multiplication album.

### **Modifications**

See Differentiation Chart.

Scholars will use a number line to practice finding the fact family products.

### **Extension**

Using fact family triangles, scholars will write division number stories. Use Math Masters p.407 as a template.

### **Enrichment**

Scholars with multiplication mastery skills will be given blank fact triangle templates to create their own problems.

### **Assessment(s)**

Scholars will be assessed through their fact houses and through informal observation.

### **Homework**

Home links 4.6-multiplication and division fact triangles worksheet.  
Practice Multiplication Facts.

## **BCSE Lesson Plan**

**Grade: 3**

**Subject: Math 4.7**

### **Standards**

NYS: See NYS Standards Chart

CCSS: SMP4, SMP5, SMP6, 3.OA.5, 3.OA.7

### **Objective: Multiplication Baseball**

- ❖ Practice Multiplication facts 0-6. Continue using the turn-around rule, Multiplicative Identity, and Zero Property of Multiplication.

### **Materials/Resources**

- ❖ Baseball Multiplication game mat (Math Masters, p.443)
- ❖ 2 six sided dice or 2 12 sided dice if playing advanced version
- ❖ 15 counters per team
- ❖ SRB p.274-275

### **Motivation**

#### **Math Message**

How many baseball teams of exactly 9 players each can be made from 45 players? Write a number model.

The main purpose of this lesson is to learn a new Multiplication game and practice multiplication facts. Multiplication Baseball can be played in groups of 2 up to 30. It has rules similar to those in baseball, but the most important rules are those regarding Multiplication.

\*see Multiplication Baseball template

### **Mini-Lesson/Direct Instruction**

Scholars will follow along with their own copy of rules.

Rules are similar to the rules for baseball, but this game lasts only 3 innings. In each inning, each team “bats” until it makes 3 outs. Teams roll 2 die to see which team goes first. The team with the highest product gets to choose whether they want to “bat” or “pitch” first. The team with more runs when the game is over wins.

### **Pitching and Batting**

Members of the team not at bat take turns “pitching.” They roll the two dice to get 2 factors. Players on the “batting” team take turns multiplying the 2 factors and saying the product.

The pitching team checks the product. (Use the Multiplication/Division Facts Table in Blank Materials) An incorrect answer is a strike, and another pitch (dice roll) is thrown. Three strikes make an out. Hits and runs: if the answer is correct, the batter checks the Scoring Chart on the game mat. If the chart shows a hit (single, double, triple, or homerun), the batter moves a counter to a base as shown in the Scoring Chart. Runners already on base are moved ahead of the batter by the same number of bases. A run is scored every time a runner crosses home plate.

Teacher will model a few “pitches” to demonstrate how the table works.

### **Guided Practice**

Class will join their math partners (heterogeneous grouping) and play against other partnerships. Questions regarding scoring, teams, and materials will be answered during this time. Teacher will walk around, ensuring rules are being followed and understood.

### **Independent Practice**

Scholars must find the product of the 2 facts (dice) independently.

## Share/Reflection

Scholars will share their thoughts based on this experience playing Multiplication baseball, how they might improve their “play” and what strengths and weaknesses have been noticed in regards to multiplication.

## Sing Along

Scholars sing along to x5, x10, x11 multiplication album

## Modifications

See Differentiation Chart.

1. Scholars will use arrays and counters to solve multiplication problems.
2. Baseball multiplication rules should be printed out for scholars to refer to when they are playing the game.

## Extension

Scholars will use their knowledge of arrays to arrange 36 counters into as many arrays as possible. They will record their combinations.

## Enrichment

Scholars with multiplication facts 0-6 memorized will use 12 sided dice (or use 4 dice) in order to memorize multiplication

Baseball Multiplication

(Inside) Materials

- ❖ Baseball Multiplication Game
- ❖ 2 6-sided dice
- ❖ 4 pennies/counters

Players

2 teams of one or more players

## Grade 3 Practiced Skill

### Operations & Computation

Automatically recall/compute all other facts.

### Object of Game

Rules are similar to baseball – team with the most runs after 3 innings wins!

### Directions:

1. Members of one team take turns “pitching” by rolling the two dice to get two factors.
2. Members of the “batting” team take turns multiplying the factors and saying the product.
3. Members of the “pitching” team check the product (calculator or Multiplication/Division Table).
4. An incorrect answer is a *strike*, and another pitch is thrown. Three strikes make an *out*.
5. If the answer is correct, the batter checks the Scoring Chart on the game mat and moves a penny to the base shown for that product.
6. Runners already on bases are moved ahead of the batter by the same number of bases.
7. A *run* is scored every time a runner crosses home plate.
8. Use the Runs and Outs Tally on the game mat to keep tally of runs scored and outs made for each inning.
9. At the end of each inning, record the number of runs on the Scoreboard.

### Advanced Version: play with a 12-sided die

1. Members of one team take turns “pitching” by rolling the die twice to get two factors.
2. Members of the “batting” team take turns multiplying the two factors and giving the product.

3. When the batter gives the correct product, check the Scoring Chart on the game mat.
4. The rest of the game is the same as a regular game of Baseball Multiplication.
5. Can pretend that 11 or 12 on the 12-sided die is a 10 to make it a little easier.

## BCSE Lesson Plan

### Grade 3

### Subject: Math 4.8

#### **Standards**

NYS: See NYS Standards Chart\*

CCSS: SMP1, SMP2, SMP5, SMP6, SMP7, SMP8, 3.NBT.2, 3.OA.1, 3.OA.3, 3.OA.4, 3.OA.5, 3.OA.7, 3.OA.8

#### **Objective: What's My Rule**

- ❖ Multiplication function machine
- ❖ To review multiplication using function machines (IN/OUT boxes)

#### **Materials/Resources**

- ❖ Counters
- ❖ Math Handout
- ❖ Construction paper/crafts
- ❖ Interactive Video

#### **Motivation**

Review previous nights' homework.

Discuss scholars' knowledge of robots and their uses. Discuss places or occasions where scholars have seen them working, etc. Review with scholars addition/subtraction function machines. Share with scholars that today they are going to make a Multiplication Function Machine Robot. This concept is the same as addition/subtraction function machines, but today they are going to use multiplication/division!!

## Mini-Lesson/Direct Instruction

### Math Message

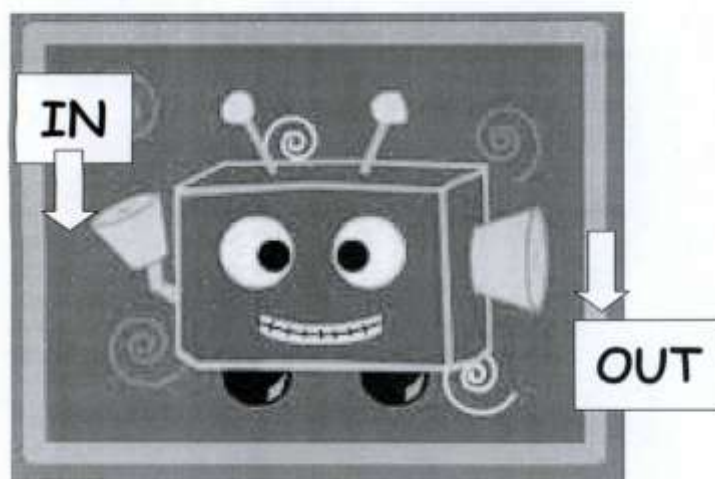
Solve this problem TWO different ways:

$$7 \times 3 = \underline{\quad}$$

Scholars should notice that they may either use repeated addition ( $7+7+7$ ) or form 3 groups of 7/7 groups of 3.

Explain to scholars that they will use a multiplication function machine to practice their multiplication facts and to solve for patterns etc. Scholars may use their multiplication table as a resource if they do not have their facts memorized yet.

### Guided Practice



Display rule and function machine. Model for scholars how to use the rule to solve for the output. Continue to model several more examples leaving input, output, OR rule blank. Remind scholars to use the arrow as a strategy to help them solve. The direction of the arrow will help them visualize whether or not they are multiplying ( $\text{in} > \text{out}$ ) or dividing ( $\text{out} > \text{in}$ ).



Scholars will come up to the SmartBoard to complete more multiplication function machines.

Challenge scholars by filling in the output and having them work backwards to solve or figure out a rule.

Counters will be in the center of tables as a resource.

### **Independent Practice**

After scholars have completed the independent board work (function machine examples), teacher will review answers so scholars can check their work. Next, scholars will be given construction paper, glue, scissors, and markers. Scholars must create their own “Function Machine Robot.” The body will have the rule as well as the table and the rest of the robot’s body will be decorated with math symbols/robotic features, etc. Scholars must cut out 2 rectangular arms, 3 rectangular legs, square for the head and a larger rectangle for the body. Teacher will show an example (made prior to lesson). They must use the arrows strategy and show any work (pictures/arrays) they use to solve.

### **Share/Reflection (Closure, connection, scholars share/reflect while teacher continues to check for understanding, exit slips)**

Scholars will share their multiplication function machines robots with the class. These machines can then be displayed and solved by other scholars.

### **Sing Along**

Scholars sing along to x6, x7 multiplication album

### **Modifications**

See Differentiation Chart.

1. Scholars may use fact family cars or counters.
2. Heterogeneous partnering.

**Extension**

Scholars will use arrays to prove that the sum of two odd numbers is always an even number.

**Assessment(s)**

Function Machine Robot

**Homework:**

- ❖ Function Machine worksheet
- ❖ Practice Multiplication Facts

## BCSE Lesson Plan

### Grade 3

### Subject: Math 4.9

#### **Standards**

NYS: See NYS Standards Chart\*

CCSS: 3.OA.1, 3.OA.3, 3.OA.4, 3.OA.5, 3.OA.7, 3.OA.8

#### **Objective: Multiplication Comparison Sentences**

- ❖ Scholars will be able to use  $<$ ,  $>$ ,  $=$  symbols to compare multiplication products.

#### **Materials/Resources**

- ❖ Whiteboards
- ❖ Dry Erase Markers
- ❖ Erasers
- ❖ SmartBoard
- ❖ Brain Pop video – Comparing Numbers

#### **Motivation: (The purpose, connection to experiences, or review of a previous lesson) 5 min.**

Teacher will display “less than” and “greater than” symbols on the SmartBoard. The teacher will review with the scholars what the term “comparing” means. When one compares two things (numbers, object, etc.) one is being asked to tell how they are alike or different. In math, numbers are compared by how large or small they are. The teacher will explain that the “greater than”, “less than” and “equal to” symbols are used to compare those two values. A number is “less than” when it has a smaller value. A number is “greater than” when it has a larger value. Numbers are equal when they have the same values. Teacher will then introduce the Alligators. Scholars will quickly sketch a greater than and less than alligator. Remind scholars that alligators are large animals and

are ALWAYS hungry; therefore, the alligator always eats the larger number. Teacher will orally give scholars a few comparison problems using whole numbers and scholars will be asked to open their “alligators” (arms) toward either the wall or the door, depending on which number is greater/less etc.

### **Mini-Lesson/Direct Instruction**

Display several multiplication problems on the SmartBoard. Explain to the scholars that they will be using the “greater than,” “less than,” “equal to” symbols to compare multiplication products. They will first have to solve each multiplication problem. Once the multiplication problem is solved, they will use the “greater than,” “less than,” “equal to” to compare the multiplication products. Encourage the scholars to write the product to the multiplication problem on the side.

Scholars will watch Brain POP video on Comparing Numbers:

<http://www.brainpopjr.com/math/numbersense/comparingnumbers/preview.weml>

### **Guided Practice**

The teacher will display several multiplication problems on the SmartBoard. Scholars will copy and solve the problems in their notebooks. The teacher will call on several scholars to answer the problem on the board. Scholars must be able to explain how he or she got their answer. The class should be checking their work as scholars get called up to compare multiplication products.

### **Independent Practice**

Teacher will hand out a white board and dry erase markers. The teacher will display several multiplication equations on the SmartBoard. Scholars will use their white boards to solve the problems. As the scholars are solving the problems, the teacher will be checking for understanding.

## Share/Reflection

Scholars will complete an exit slip. The exit slip will contain several problems in which scholars will have to use  $<$ ,  $>$ ,  $=$  symbols to compare multiplication products. They will also have to provide an explanation in words explaining why they chose their answer.

## Sing Along

Scholars sing along to x6, x7 multiplication album.

## Modifications

See Differentiation Table.

1. Heterogeneous partnering
2. Scholars may use the multiplication table to help compare multiplication problems.

## Enrichment

Scholars will be given larger factors to compare (3 digit x 3 digit – lattice method)

## Assessment(s)

- ❖ Exit Slip 4.9
- ❖ Informal Observation

## Homework

- ❖ Comparison Worksheet
- ❖ Practice Multiplication Facts

## Unit Extensions

### **Extension: Baseball Multiplication**

The 3<sup>rd</sup> grade team decided to play Multiplication Baseball in our school playground. Our large dry-erase board was our scoreboard and we used giant Styrofoam dice for all to see. We followed the same rules as the classroom version for the exception that children were the counters and every child, as long as they got a “hit,” was able to swing for the fences.

It became clear that by bringing the game outside, allowing our scholars to work as a team, run and cheer for each other within the context of mathematics creates a more meaningful situation for them. Scholars were highly motivated, excited and supportive of teammates. By playing Multiplication Baseball outside, it created an opportunity to develop positive attitudes towards mathematics, sharpen multiplication facts and build camaraderie.

### **Mad Minutes**

In order to assess scholar’ retention of their multiplication facts, the 3<sup>rd</sup> grade team gave each scholar mad minutes to assess their familiarity with their multiplication facts. Each scholar was given a paper with various multiplication facts on several different levels. After each completed level, the scholar moved on to an increasingly challenging level. Along with Mad Minutes, the 3<sup>rd</sup> grade team built a Multiplication Tracker. The tracker was modeled after a football field with each scholar’s name on a football. Each football yard was aligned with multiplication levels. As scholars completed and passed each Mad Minute, they were able to move their football. The tracker was a way to monitor scholars’ progress as well as motivation for the scholars. Once scholars’ footballs passed the 0-6 yard line, they were given

multiplication pencils. When scholars completed multiplication facts 7-12, they were awarded a multiplication medal and a certificate.

Quick Quiz 0 - 2									
$\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 0 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ \times 0 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 3 \\ \hline \end{array}$
$\begin{array}{r} 11 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 0 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 18 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 19 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 20 \\ \times 2 \\ \hline \end{array}$
$\begin{array}{r} 21 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 22 \\ \times 1 \\ \hline \end{array}$	$\begin{array}{r} 23 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ \times 0 \\ \hline \end{array}$	$\begin{array}{r} 25 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 26 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 27 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 28 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 29 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 30 \\ \times 5 \\ \hline \end{array}$

## Parent Workshop

Parents were asked to complete a survey as to whether or not they were interested in a Math Workshop on multiplication. After a large amount of parent interest, the 3<sup>rd</sup> grade-team put a PowerPoint (attached) together focusing specifically on multiplication. The workshop lasted about an hour and taught parents several different ways to solve multiplication problems (repeated addition, arrays, diagrams, pictures, lattice). The parents were also taught easy games to play at home, such as multiplication war and multiplication bingo, to make learning multiplication facts fun. The 3<sup>rd</sup> grade team thought it was important to show parents various ways to help their child at home to bridge the Mad Minutes gap within the classroom.

## Multiplication Fortune Tellers

As another way to help scholars practice their multiplication facts, they will be given a multiplication fortune teller template that they must cut out, decorate, and fold (see picture). Scholars can play this game with their math partners if they finish an activity early or during math games.

## Math Club

Math Club is an after school club that allows struggling math scholars to get the extra support they need. The third grade team used

assessments, exit slips, and informal observations to decide which scholars should participate in Math Club. During the after school club, scholars use games, manipulatives and interactive activities to practice unit skills. The teacher may use the time to re-teach concepts taught earlier in the day, as well as work on one with individual scholars. Scholars receive one on one time as well as work with their peers in small groups to complete activities. The main focus is to use the multiple intelligences and a smaller work environment to gap weaknesses and reinforce skills.

### **Multiplication Bingo**

During a math games day, scholars can play multiplication bingo. They must know their multiplication facts in order to know where to put their red counter/square. This is another way to help scholars master their multiplication facts.

### **Letter to Japan – Extra Credit**

Scholars were given the option of writing a letter to children in Japan. The purpose of their letter was to ask how they learn multiplication in their classroom. The letter would be sent to a Japanese/American school and, hopefully, a response with new methods of how to multiply numbers would be received. This also connects to our writing unit, where scholars were asked to write persuasive letters about something they wanted to change at our school.

### **Math Investigations.**

The purpose of our unit was to expose scholars to the many ways we use multiplication in everyday life. We practiced the idea of equal shares while outside during Physical Education. While scholars were outside stretching, they would form various arrays as well as break up into equal groups as they split up into teams. As a way to showcase multiplication in our daily lives, the class went on a scavenger hunt



throughout the school to see equal groups and arrays such as equal numbers of chairs, books on a shelf, and table formations.