**Team members: (Revised 4-16-13)**

**Date of lesson: Time and location:**

**Instructor: Grade level/ Course: 3rd / 4th Grade**

Title of the Unit: Unit 9: Divide Greater Numbers

Title of the Lesson: Divide 1-Digit Numbers into 3-Digit Numbers, PART I

1. **Mathematical Practice to Focus on during this Lesson Study.**

**Other Overarching Goals (not specific content goals)**

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| **Look for and express regularity in repeated reasoning.** |

1. **Important Mathematical Concepts of this Lesson (Include Standard)**

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| **CA Standard**  **NS2.2 memorize to automaticity the multiplication table for numbers between 1 and 10.**  **Leads to:**  **NS 2.5: Solve division problems in which a multi-digit number is evenly divided by a one-digit number.**  **CCSS Standard:**  **3.NBT.3: Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9x80, 5 x 60) using strategies based on place value and properties of operations.**  **Multiplication of multiples of ten**  **Subtraction**  **Place value**  **Division is equal groups of a whole (Fair sharing)** |

1. **Research Question**

**What do you hope to learn about student understanding/misunderstanding from this lesson study? What evidence will be collected during the lesson?**

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| **Will students have difficulties with multiples of ten?**  **Will students understand that the number increases because of the increase in place value?**  **Will students be able to select the multiple of ten that most efficiently addresses the target number or do they need to make several tries with multiples of ten?** |

**Progression of Lesson**

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| --- | --- | --- |
| **Materials Needed:**   * **Document camera** * **Number Talk problems** * **Worksheet for guessing closest friendly number** * **Worksheets with grid for working out division problems** |  |  |
| **Activity/Questions** | **Things for teacher to remember/Anticipate students’ responses** | **What observers should look for** |
| 1. **Anticipatory Set**   **Introduce myself.**  **Present the norms for the lesson (based on CGI):**   * **We all make mistakes.** * **Listen respectfully.** * **Be ready to re-voice what other students have said.** * **Be ready to share out what was discussed in your group.**   **I DO**  **Number Talk: We are going to work with some numbers that are called “friendly” numbers. After we work with these numbers I will ask why you think they are called “friendly” numbers.**  **Ask students: What is…**  **2 x 1 = ?**  **2 x 5 = ?**  **2 x 10 = ?**  **2 x 100 = ?**  **Ask students: Why do the products increase?**  **Ask students to multiply:**  **2 x 20 = ?**  **2 x 50 = ?**  **2 x 80 = ?**  **2 x 300 = ?**  **2 x 700 = ?**  **Ask students,**   * **“What pattern do you see?”** * **Circle the Friendly Numbers and ask: Why do you think these are called “friendly” numbers?** * **What do you think would be an example of an “unfriendly” number?**   **Extension:**  **Ask: What is the answer to:**  **2 x 1000 = ?**  **2 x 3000 = ?**  **Explain how you got your answer.** | **Have students show with their hands if they understand and agree with the norms.**  **Make clear that the digit 1 stands for a different number each time. First it is in the ones place, then tens place, then hundreds place.**  **Keep in mind that the students are not “adding a zero” but multiplying twenty tens, thirty tens, etc. Model if necessary.**  **Example: 20 + 20 =**  **Remind students that the digit 1 is one thousand and we are summing 2 groups of 1000.**  **1000 + 1000** | **Do students demonstrate by waving their hands that they have heard and agree with the norms?**  **Do students answer that adding zeros is the reason why the products increase?**  **Do students understand that the digit 1 stands for a different number each time?**  **Do students want to explain by saying they got the answer by multiplying 2 x 2 and adding a zero?**  **What reason do students give for calling the numbers friendly?**  **What examples do students give for unfriendly numbers?**  **What answers and examples do students give for making an unfriendly number into a friendly number?**  **Do students say they multiplied 2 x 1, got 2 and put three zeros after the number?** |
| **II. MainActivities/Tasks/Questions**  **WE DO**  **Pass out student worksheet: Guess the Friendly Number**  **To scaffold this activity, ask the student for some Friendly Numbers and write them above the box for the student’s name. (ex. 5, 10, 20, …,100, 200, 300, …, 1000, 2000, …).**  **Have students practice selecting friendly numbers that will come close to a given number, when multiplied by the one-digit number (2).**  **Students’ guesses may not result in numbers larger than the given number.**  **YOU DO**  **Have students work on their own (or in groups/partners) to come up with friendly numbers that come close to a given number, when multiplied by a one-digit number (3).**  **Have students share their guess and explain how they got their guess.**  **Students may need more practice before going to Part II which uses Friendly Numbers for division. The WE DO and YOU DO may be spread out as a Math Talk over the course of a week, taking only 10-15 minutes a day.**  **Ticket Out the Door:**  **Have students on their own make guesses using friendly numbers to find products that come closest to a given number.**  **Go over student work and select papers to show class (Do not show students’ names.).**  **Select papers that have interesting strategies to find the friendly number. Show papers with misunderstandings and those that did not follow the directions to use friendly numbers.** | **If students suggest other friendly numbers that are not as efficient, ask students if this number will get you the closest to the target number.**  **Use Math Talk/Number Talk strategies throughout the presentation of the lesson.**  **Strategies:**   * **Thinking time.** * **Show you have an answer with a thumb against chest** * **Use other fingers to show how many ways can come up with an answer.** * **Students share how got the answer. Why?** * **With class determine if one of the answers is the right answer.** * **Use Think, Pair Share and have students share out what was said in their group.** * **Use re-voicing to promote participation and reinforce strategies.** * **Ask students if they have anything to add on.** | **Do students have difficulties selecting the multiple of ten that is most efficient?** |

**To complete the lesson on this strategy go to Friendly Numbers and Rectangular Division, Part II**

[See below for worksheets to Part I.]

**Number Talk**

**2 x 1 = 2 x 20 =**

**2 x 5 = 2 x 50 =**

**2 x 10 = 2 x 80 =**

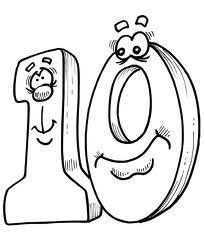
**2 x 100 = 2 x 300 =**

**2 x 1000 = 2 x 700 =**

**2 x 3000 =**

**What are some Friendly Numbers?**

**What**

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NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Guess the Friendly Number!!!!!!!**

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 2 by the Friendly Number comes closest to the number \_\_\_23\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 2 by the Friendly Number comes closest to the number \_\_\_\_41\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 2 by the Friendly Number comes closest to the number \_\_\_124\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

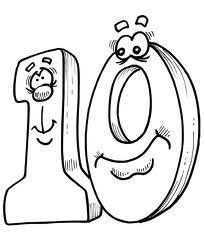
Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 2 by the Friendly Number comes closest to the number \_\_72\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

**(YOU DO)**

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NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Guess the Friendly Number!!!!!!!**

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 3 by the Friendly Number comes closest to the number 32 .

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 3 by the Friendly Number comes closest to the number 17 .

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 3 by the Friendly Number comes closest to the number 157 .

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

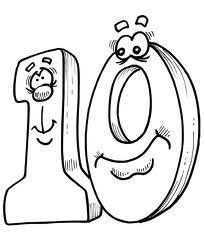
Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 3 by the Friendly Number comes closest to the number 138 .

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

**(TEMPLATE)**

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NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Guess the Friendly Number!!!!!!!**

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

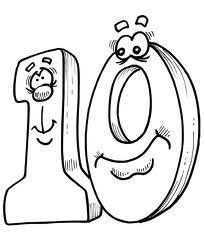
X = \_\_\_\_\_\_\_\_\_\_\_\_

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

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**Ticket Out the Door**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 4 by the Friendly Number comes closest to the number 21 .

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 4 by the Friendly Number comes closest to the number 86 .

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

Multiplying 4 by the Friendly Number comes closest to the number 172 .

Multiplying by the Friendly Number comes closest to the number \_\_\_\_\_\_\_\_\_\_\_.

X = \_\_\_\_\_\_\_\_\_\_\_\_