Lesson Title: Frogs and Ducks

Grade: 3rd

Content Standard: 3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations. By the end of grade3, know from memory all products of two one-digit numbers.

3.OA.1 Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each.

3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56/8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measured quantities, e.g., by using drawings and equations with a symbol for the unknown to represent the problem.

3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

Materials: White board number line (my preference is for a large 20' laminated line that can be attached to the board, calibrated by ones, with numeral markings at multiples of ten. The numeral length of the line will depend on needs and skill of children, but eventually it should go up to 100).

Laminated desk sized (2-3') versions of board number line that can be used with dry erase markers.

Dry erase markers

1 duck picture and 3 frog pictures that can be positioned anywhere on the board number line.

Note cards or dry erase boards for each group.

Shared experience and procedure details: Divide class into small groups of 3-4 students. Each group needs a desk number line, dry erase marker, and recording device (dry erase board, note cards, paper). The teacher selects a target number (let's say 20) and places the duck at that number on the board number line. The teacher assigns a group (group A) as the duck hunters. The rest of the groups each get one frog. The duck hunters (group A) select a number that is a factor of the target number (20). This factor represents the size of the jumps/skips, starting at 0 that when repeated B times will land on the target (4 x B = 20, B = 5, 5 jumps of 4 will land on the target). The story scenario is as follows: The duck hunters are standing on the shore (0) and are trying to hit the duck (20). They skip a rock at the duck and each skip size is 4 (or they may select some other factor of 20 as a skip number). The rock hits the water at the multiples of 4: 4,8,12,16,20. The frog groups each get to place a frog at any whole number >0 and < 20. If the skips of the duck hunters land at a number where a frog has been placed, then the rock is stopped and the duck is saved. If the skips of the duck

hunters encounter no frogs and the duck hunters have correctly used a factor of the target number, then the duck is dinner. All groups, both the duck hunter group and the frog groups should submit their numbers simultaneously. The teacher can then position all the frogs on the number line. Next the teacher draws in the skips generated by the skip number to determine the result. Record results and rotate groups.

Note: The teacher will probably need to impose a time limit for the groups to generate their numbers to keep the game moving briskly.

After a period of play assign the whole class a target number (i.e. 30). Ask them to determine one place they could locate a frog that would stop as many skip numbers as possible. Have them draw a picture and write about their choice.

Possible Picture: The students may show a number line to 30, placing a picture of a frog somewhere on the line and show repeated skips of different sizes that would land on the frog. The picture may instead incorporate some symbolic representation of the skip. A skip number of 5 might be written as 5,10,15,20,25,30 instead of being drawn as bumps on a line

Possible People Talk: Students may talk about their strategies for selecting one frog number. They may suggest that if you find all the <30 multiples of every factor of 30, you should place the frog on the multiple that is most common. The students may suggest that they didn't use a systematic strategy, but instead found one multiple of one factor of 30

Feature Talk: multiple, factor, skip number, target number, duck, frog, multiply, compare, add, number line, rock

Symbolic Representation: 2x15 2,4, 6,8,10,12,14,16,18,20,22,24,26,28. 15x2 15 3X10 3,6,9,12,15,18,21,24,27 10x3 10,20 5x6 5,10,15,20,25,30 6x5 6,12,18,24

Case, Cordle, Reinthal 1/13/17