

## **Humberwood Downs: Exploratory Lessons for M4YC**

**Below are the exploratory lessons designed by the teacher team.**

### **Human Number Lines**

Three students are asked to line up side by side and the class is asked "Who is in the middle?" The number of students is increased, so one student is in the middle, e.g., 5, 7. The students reflect on strategies such as, having the same number of students on each side determines the middle. Then a challenge is posed with having 5 students.

The students are asked "Who is in the middle?" At this point the students reflect on the fact that a person is not the middle, but a space, with the same reasoning that having the same number of students on each side determines the middle. In Kindergarten we used a marker to show the person in the middle, such as a picture of a sun placed above the person in the middle.

### **Tim Horton's Scenario**

The Tim Hortons' exploratory lesson was one of the early lessons to consolidate the students' concept of "middle as halfway". The students enjoy "Timbits," and this was used as context to extend their understanding of "middle" and to link "middle" and halfway to distance. Butcher paper was used to represent the road from the school to the zoo. A stop had to be made halfway so we could buy some Timbits. Students were to estimate and mark the middle on the road, and then use the folding strategy to prove or disprove their estimate.

### **Hundred Chart**

In an effort to connect the understanding of a hundred chart to a number line, we used the hundred chart to find the middle, using the strategy of the same number of "things" on each side determines the middle. The challenge was posed when we compared finding the middle with and without the zero.

### **Freezie Lesson**

The Freezie lesson was to provide students practice in locating "middle" to determine "half of a whole". A freezie was shared by two teachers. The students instructed the teacher to cut the freezie in two, so the teacher purposefully cut it in  $1/4$  and  $3/4$ . The students pointed out that the freezie was not cut in half and suggested ways to find the middle of the freezie. A ruler was used to measure and locate the "middle" and to find a "half".

### **Clothesline Lesson**

The clothesline lesson was one of the early exploratory lessons to give students practice in locating "middle", "proportional spacing", and to consolidate their understanding of "middle as halfway" and to develop spatial reasoning. A clothesline was made with

numbered 3x5 cards and clothes pegs. Students were told that a strong wind came and blew all the clothes off the line and only zero and ten remained on the line. The number five card was replaced on the line, and students were asked to help put the clothes back on the line. The emphasis of this lesson was locating middle and equal spacing of the numbered cards on the clothes line.

## **Solving Addition and Subtraction Word Problems Using the Number Line**

Children worked with counters and with the number line. The number line displays counting and measurement simultaneously. Using the number line gives students a visual image of the operation being done and a better understanding of the answer. Also, the number line helps students experiment with decomposing numbers.

Benefits: Over time, this will enable students to become more capable in performing mental computations. Numbers can be decomposed and the subunits or smaller amounts can be added or subtracted in varying orders, yet still be equivalent.

## **Make Your Own Ruler**

Children were asked to examine different types of rulers and comment on what they noticed (e.g., numbers, equal spacing, starts at 0, etc.). Children were then invited to create their own rulers. Children had the choice of either a small, medium, or large sized strip of paper to create their ruler with. After completing their rulers, children were asked to consider how they knew where the middle was (some children folded paper in half, some eye-balled midpoint, some reasoned numerically, etc.). Children were also asked to compare their rulers with peers and reason about similarities and differences between various rulers.

## **Use of Technology – iPad Apps**

Our team has been exploring the use of technology to support students' number sense. Here are some of the apps that we've been using with students:

a) 10 Frame Fill <http://itunes.apple.com/us/app/10-frame-fill/id418083871?mt=8>

b) Line em up <http://itunes.apple.com/ca/app/line-em-up/id419041848?mt=8>

c) Teaching Number Lines <http://itunes.apple.com/us/app/teaching-number-lines/id492603378?mt=8>

Info Instructions Options

How many more to make 10?

0 1 2 3 4 5 6 7 8 9 10

Jump forward to show:  
 $8 + 2$

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Options Instructions Info

4 6 7 10 11 14 15 16 17 18

13 5 12 9 8