**Unit Title:** Number Concepts / Number and Relationship Operations – Grade 3

**General Outcome:** Students will demonstrate number sense and apply number theory concepts.

**LESSON 1 – 60 minutes**

**Lesson Title:** A1 – Compare and order whole numbers to thousands.

**Goals:** Students will be able to, after this lesson, identify the greatest of two whole numbers and to order a set of numbers from greatest to lowest (or vice versa).
- *Remember to stress the digits placed in the hundreds place and their importance; when modelling comparisons, for example using 600 and 579, stress that the “79” is not actually enough to increase the number in the hundred place by one more.*

**Materials:**

* Paper
* Pencils
* Activity worksheets
* Notebooks
* Cue Cards
* SMARTBOARD (can also use the whiteboard)
* Number cards
* Dice

**Warm up/Introduction – 8-10 minutes**

Activity: Which is greater?
Prepare a deck of cards with 2 and 3 digit numbers on each. Students will be paired up and given one deck per pair. One student will shuffle the cards in order to assure that they are well mixed, and then will divide the deck into two equal piles, keeping one and giving one to his partner. At the same time, both students will flip the top card of their pile and the one with the highest number card wins the round and collects the two cards. Once the deck is completed, the student with the most cards wins the game.

* *Throughout the warm up activity, I (as the teacher) walk around to observe and identify which students show more difficulty understanding the concepts of greater versus smaller.*
* *Following the warm up, I would quickly review the greater than and less than (<,>) signs with a quick explanation of what they mean all the while using an example (such as 389 is \_\_\_ than 657).*

**During/Sequence of Lesson – 30-40 minutes**

Activity (10-12 minutes): Fill in the blanks
Prepare 5-10 questions, which will be shown on the SMARTBOARD, using the greater than and less than symbols in order to have the students identify the correct symbols based on a comparison of two numbers. For an added challenge, blank out the hundred numbers on one or both sides of the equation, for the last few questions, and have the students try to identify which number they believe should fill in the blank based on the rest of the equation given. Have them complete their answers in their notebook first and then they will volunteer to write their answer on the SMARTBOARD.
- This will be followed by an open discussion to check for the understanding of all students.
*\*\* See attached example sheet, 1.1.*

* *Once the concept of the greater than and less than sign is reviewed with the hundred place numbers, the thousand numbers can now be introduced to the student.*
* *Using prepared cue cards with 3 and 4 digit numbers written on them (big enough for the students to see), have students volunteer one at a time – by raising their hand – to identify the greater number when comparing two of them, or to sort a list of numbers from greatest to lowest (or vice versa).*
* *Each student must then come up with their own two different 3 and 4 digit number, write them on a piece of paper and with their shoulder partner, have them share and explain to one another what their answer is and why they think so. Encourage them to use base ten models to explain their choice. (5-10 minute discussion)*

Activity (10-15 minutes): First to ten

Keep the pairs from the above discussion and distribute one number wheel and one die per pair. The number wheel, which is divided into 6 parts – numbered at the top in small from 1 to 6, has either 3 or 4 digit numbers on each “slice”. One at a time, the students will roll the die and the numbers they get upon rolling; they will place a counter on the slice of that number. For example, if student 1 rolls a 4, he finds the fourth slice and puts his counter on the number in the fourth slice. The student who has the greater number (*or lower, choice is the teacher’s*) then collects the counters on the wheel and then the student who rolled second now rolls the die first. However, once the two students have rolled and identified their numbers on the wheel, the first to roll speaks the sentence “(number on slice) is greater than/lower than (number on partner’s slice) because (gives explanation).” If it happens that both students roll the die and land on the same number, they break the tie by not counting the round and by rolling again. The counters are collected by the winner after the two students have agreed and understood why the answer is correct. The first student to reach 10 counters wins the game.
- For this activity, try to have students be paired together as having one who understands this concept well with one who may have a bit more difficulty in order for them to work together when explaining the reasoning of the “greater/lesser than” answers.
*\*\*See attached wheel example sheet, 1.2*

**Wrap-Up/Closure - 8-10 minutes**

* *Following the discussions had by the students among each other, I will then ask them to tell me – by raising their hand and waiting to be called upon – why the 2 digit numbers are always less than the 3 digit ones? And why the 4 digit numbers are always greater than the 3 digit ones?
This discussion enables for the students who might still be a little bit confused about the “greater than/less than” concept to hear how their peers have understood it. This may also help grasp the concept better by hearing different views/methods of explaining.*
* *Provide one last activity which, if not completed during the remainder of class is to be completed at home for the next class.*

Activity: Greater than/less than

Provide a list of “greater than/less than” examples and ask students to write their answer on the worksheet provided to them. The answers will be discussed and explained during the beginning of the following class.
*\*\* See attached example sheet, 1.3*

**LESSON 2 – 60 minutes**

**Lesson Title:** A2- Estimate the nearest size of numbers to the nearest ten or hundred

**Goals:**  Students will be able to round up in order to estimate results in problem-solving contexts. Instead of simply applying the “5” rules (like 5 or greater rounds up or less than 5 round downs), the students needs to learn to do what makes sense in each situation. “Making sense” would then mean to either underestimate (rounding down) or overestimate (rounding up) to the nearest ten, hundred or even thousand.

**Materials:**

* Activity worksheets
* Hundreds chart for rounding
* Pencils
* Students’ notebooks
* Whiteboard/markers (or can use SMARTBOARD)

**Warm up/Introduction – 10-15 minutes**

* *Review the “greater than/less than” questions from the previous class by asking the students to share and explain their answers (by raising their hand and waiting to be called upon). In doing so, I am able to check for understanding and can identify whether or not the students are ready to move on to this next topic. (5-10 minutes)*

*(Assuming in this case – and for the purpose of this assignment- that the concepts have been understood by all students, the next lesson may be introduced)*

* *Introduce rounding up or down, explaining that you round numbers in order to make estimations, coming up with an answer that is approximate rather than exact. Show examples on the board showing that 94 would be rounded to 100, and that 517 would be best viewed as 500. Explain that rounding to the nearest ten or hundred is much easier to estimate an answer rather than to try to get an exact sum.*

**During/Sequence of Lesson – 30-40 minutes**

* *Provide each student with a Hundreds chart for rounding and show them based on the separating line and the arrows where and which numbers round up, and which round down.*

*\*\* See attached rounding chart 2.1
Give a few examples on the board, such as 164, to be rounded to the nearest ten (160) and to the nearest hundred (200), to show the difference between the two rounding and have the students estimate their answers by volunteering and raising their hand.*

Activity (10 minutes): Nearest ten and hundred

Provide every student with the nearest ten and hundred worksheet. Have them complete both columns to the best of their ability. Allow them to work either individually or with their shoulder partner. Answers will be compared as a class discussion.
*\*\* See attached example worksheet 2.2*

Activity (10 minutes): Round me up!
Provide every student with a “Round me up!” worksheet and have them complete the blanks individually. Let them know that they are timed to 5 minutes for the entire activity, where 1 minute is to be taken for each question. If the timer goes off after the minute is up and they are not completed the question, they must move onto the next. At the end of the 5 minutes, they will exchange their sheet with the student to their right; they will then have another 5 minutes to correct the sheet in front of them with the answer they believe is correct. Once these 5 minutes are up, the sheets remain to the partner and a class discussion begins to share answers. Each student is given the chance to speak up one at a time and as answers are given out, the students get to checkmark or correct their partner’s answers. Once the corrections are complete, the sheets are then returned to their owners.

*\*\* See attached example worksheet 2.3*

* *Explain that with money, usually to make things easier to estimate, we tend to round the prices to the nearest 50 cent or counting by 25 when adding totals. Giving examples such as if something is $1.30, another thing is $2.65 and something else is 75 cents, then you would most likely round up to $1.50, $3.00 and $1.00 (or some more advanced students may want to leave it at 75 cents if they choose to count up by quarters) when counting how much money in total you may need.*

Activity (8-10 minutes): How much?
Each student receives a menu meal and follows the direction. The goal is to estimate the total that their meal is to cost by rounding the prices of their chosen items. Once they have completed, they have to turn their sheet around and lay their heads on their desk and I will come around to collect the completed work for marking.

*\*\*See attached example worksheet 2.4*

* *For adding and subtracting with estimation, explain that for addition rounding one number up and the other one down usually is the best technique to arrive at a good estimate. For example, show the equations 32 + 45 (30+50) and 27 + 45 (30+40) and ask two students (one for each equation) to explain to their classmates how they would round the numbers.
For subtraction, explain that by rounding the two numbers in the equation the same way, either both rounded up, or both rounded down, is usually best to preserve the difference. For example, show that 45-32 would be rounded down to 40-30, and that 45-27 would be rounded up to 50-30).*

**Wrap up/Closure – 8-10 minutes**

* *Ask the students to get in groups of four and to each write down on a piece of paper one number that is to be rounded to the nearest ten, one number to be rounded to the nearest hundred, one addition equation to be rounded and answers, one subtraction equation to be rounded and answered. They must then, one at a time put their sheet of paper in the middle of the table and work as a team to answer the questions one at a time.*
* *I will walk around to listen and observe the level of understanding of the students and answer any questions if any arises.*
* *To completely conclude, have the students return to their seats and make a point to show that the same can be done for rounding bigger numbers, such as 4 digit ones to be rounded to the nearest thousand, the same way it was done with the hundreds and tens. Time permitting, ask them to volunteer to come to the board and write examples of numbers that are 4 digits and what they would be rounded up to the nearest thousand, hundred and ten.*

**LESSON 3 – 60 MINUTES**

**Lesson Title:** A3- Use simple fractions to describe situations

**Goals:**  Students should be able to concretely explore common fractions (and simple decimals) in meaningful situations. They should continue to use simple fractions which describe parts of a whole (ie: thirds) and parts of a set (ie: fourths) as presenting them in contexts will be much more meaningful to them. A variety of different models need to be used as much as possible in order for the students to develop fraction concepts adequately.

**Materials:**

* Activity worksheets
* Pencils
* “Give me Half!” book by Stuart J. Murphy
* Coloring pencils
* Pattern Blocks
* SMARTBOARD (or whiteboard and/or projector)
* Student Notebooks

**Warm up/Introduction – 8-10 minutes**

* *Have the students gather around on the floor (on the reading mat, for example) where they will be ready to listen as I read them the book “Give me Half” written by Stuart J. Murphy and illustrated by G. Brian Karas.*
* *Following the reading, begin a discussion with the students about fractions and what they know/remember of fractions. Have them give examples out loud of different types of fractions they know.*

**During/Sequence of Lesson – 35-40 minutes**

* *On the SMARTBOARD, show a shape (ie: a triangle) and have the students identify it. Then cut it in half and explain how the pieces are now seen as ½. With a rectangle, cut it in three and explain that now each piece is 1/3 and a square can be divided into fours to make each piece 1/4 and so on.*

Activity (8-10 minutes): What am I?

Provide each student with a fraction worksheet and have them complete each question individually. Once completed, students must turn their sheet over and lay their heads on the table in order to identify that they are done. Once the majority of the students are finished, have the sheet projected onto the SMARTBOARD and have students raise their hand to volunteer to share their answers, one question at a time.
*\*\* See attached example worksheet 3.1*

* *Explain to the students that the top number on a fraction is called the numerator while the bottom number is the denominator. Show an example on the board (such as 3/8) and explain that in this fraction, the numerator 3 simply means that there will be 3 pieces taken from a certain object. Use the pizza example, dividing it into 8 pieces (and explaining that the denominator 8 simply means that it is the total amount of pieces and those 8 pieces are required to make it a whole) and by taking 3 pieces out of it. Explain that when you have two fractions with the same denominator, like 5/8 and 3/8, for example, the fraction with the largest numerator is then the largest fraction; this can be demonstrated using the same pizza by removing 5 pieces showing that a bigger portion is gone than when 3 pieces were removed.
Do the same sort of example for explaining which fraction is largest when the numerator is the same but the denominator is different, for example in the 5/8 vs. 5/16 case where 5/8 then becomes the largest. (8-10 minutes)*
* *Distribute the “Equivalent fractions” list to the students and ask them to discuss with their shoulder partner what patterns they can identify from the equivalent fractions and how/why all those different fractions mean the same as a more simple one. (5 minutes)
\*\* See attached example sheet 3.2*

Activity (5-8 minutes): Can you make me whole?
Put students in mixed groups of 4 and give them one set of pattern blocks per table. The point is to find all of the possibilities (in fractions) of how the whole hexagon can be divided into different parts. Have the students designate themselves to have one person who will record the findings and one who will present the group’s answers to the rest of their classmates. Examples of answers could be: 6 triangles are needed to make the hexagon whole, each triangle makes up 1/6 pieces; or 2 trapezoids are needed to make the hexagon whole, each trapezoid makes up 1/2 pieces.

* *Following the activity, a class discussion will begin where the designated speaker for each group will share one to three of their found possibilities with the rest of the class. (5 minutes)*

**Wrap up/Closure- 8-10 minutes**

* *To speak of fractions in word problems, give an example out loud (by reading it off of the SMARTBOARD, for that the visual learners are able to read along) like: Suzie is going to her friend Brittany’s birthday party and is bringing one large pizza. When she gets there, her, Brittany and their 6 other friends all want a piece. How many pieces does Suzie need to cut the pizza into so that everyone can have one piece? What if she wants everyone to be able to have two pieces each? What would happen if Brittany’s little sister came in and wanted to have a piece too - how should the pizza be divided then?*

*Have students draw their answers in their notebooks. Answers will be shared at the beginning of the next class.*