Grade 1 - General Curriculum Outcomes

Number Concepts/Number and Relationship Operations

GCO A: Students will demonstrate number sense and apply number-theory concepts.

GCO B: Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations.

Patterns and Relations

GCO C: Students will explore, recognize, represent, and apply patterns and relationships, both informally and formally.

Shape and Space

GCO D: Students will demonstrate an understanding of and apply concepts and skills associated with measurement.

GCO E: Students will demonstrate spatial sense and apply geometric concepts, properties, and relationships

Data Management and Probability

GCO F: Students will solve problems involving the collection, display, and analysis of data.

GCO G: Students will represent and solve problems involving uncertainty.

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Outcomes

KSCO: By the end of grade 3, students will be expected to

i) construct and communicate number meanings, and explore and apply estimation strategies, with respect to whole numbers

SCO: By the end of grade 1, students will be expected to

A1 compare two sets for size in a variety of ways

A2 create equivalent sets and sets which differ by small amounts

Children who have number sense understand how numbers relate to each other and furnish information about the world. Number sense evolves from a child's total experiences as well as through specific activities. When first-grade children count things in the classroom or explore the operations of addition and subtraction, they are extending their earlier ideas of number. When they organize and compare groups of objects and examine multiple representations of the same numbers, they continue to broaden their understandings. These new ideas about number relationships provide a foundation for understanding number magnitude, estimation, and the effects of arithmetic operations.
(Curriculum and Evaluation Standards, Addenda Series, First-Grade Book, p. 6)

Suggestions for Teaching and Learning

A1 Students should compare the size of sets in many different contexts.

Include situations in which
- the sizes of the sets are the same
- the sizes of the sets differ

This will lead to exploring number relationships such as "one more than," "one less than," "two more than," etc. When students compare sets, ensure that sometimes the two sets are

- lined up side by side and the students pair the items
- grouped in clusters and the students need to move the items to match them one-to-one and compare the size of the sets.

It is desirable, at times, that the items in the sets go together naturally (e.g., left gloves/right gloves), and that at other times the items are unrelated. It is a natural extension for students to graph these comparisons.

Students might be encouraged to compare amounts to benchmarks such as 0 or 1, 5 or 10, so as to get a feel for the relative size of quantities.

❑ Ask children to sort a collection of buttons by various criteria (e.g., number of holes, size, shape, texture, colour) and compare the size of the sets.

A2 Students should be able to create a set equal in number to a given set by matching one-to-one. Include situations in which students need to

- add items to one set
- take items away from one set

❑ Invite students to make up story problems to solve; for example:

If the tooth fairy gives me a quarter for each tooth, and I have 4 quarters so far, how many teeth have I lost?

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Suggestions for Assessment

Performance

A1.1 Ask the student to compare the number of letters in his/her first name to the number in his/her last name to see which name has more.

A1.2 Divide a group into teams, unequal in number. Ask the student to "fix" the teams so that the group is fairly distributed.

A1.3 Put out a set of 10 photos, each of which includes a person or people. Ask the student to sort the photos into two groups and decide which group has more photos. Students might graph the two group sizes.

A1.4 Have the students play "Dot Bingo." Rules:
- Take turns rolling a die.
- Cover any one square that is one more than the top number on the die.
- The player who first covers three in a row is the winner.

Ideas - Arithmetic Teacher

Game: Dot Bingo

2	4			7
	3	3		
7	5	Free		6
		4		
6		3		4

A2.1 Show the students several right-hand prints and a smaller number of left-hand ones. Ask them to dip their hands in finger paint and end up with as many left-hand prints as righthand prints.

A2.2 Provide a geoboard. Ask the student to make two shapes, one with almost 5 sides and another with one more side than the first.

Interview

A1.5 Ask: How might you find out if more people like or dislike peanut butter?

A1.6 Place 3 red counters and 2 blue counters in one group and 3 blue and 2 red in another, as shown: RRR BBB
BB RR
Ask: How do you know there are the same number of each colour?

A1.7 Ask: Where might you see more adults than children? Why?

Resources

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Outcomes

KSCO: By the end of grade 3, students will be expected to

i) construct and communicate number meanings, and explore and apply estimation strategies, with respect to whole numbers

SCO: By the end of grade 1, students will be expected to

A1 compare two sets for size in a variety of ways (Cont'd)

A2 create equivalent sets and sets which differ by small amounts (Cont'd)

A3 count in a variety of ways

Suggestions for Teaching and Learning

A2 (Cont'd)

❑ Invite students to create their own "dot" stories; for example:

If the dots inside the circle are seats on a bus and the dots outside the circle are children, the story might be that there are just enough children to fill the seats.

Students should be able to create a set which is
- one more than a given set
- one less than a given set
- around 5
- a bit less than 10
- close to 0
- etc.

A3 Students should be encouraged to count items in natural situations that arise in the classroom. They should also continue to practise rote counting.

Include situations which require
- counting forwards and backwards
- counting on by ones from a given number
- skip counting (e.g., 2, 4, 6, 8,... 1, 3, 5, 7,...)

❑ Ask students to count items which occur naturally in twos (e.g., shoes, hands, eyes).

❑ Place 5 counters under a cup and tell the students that they are there. Show 3 more beside the cup. Ask: How many counters are there altogether?

❑ Invite students to sing songs and recite poems which involve counting backwards and forwards; for example: "Ten In A Bed"; "One, Two, Buckle My Shoe"; "This Old Man"

❑ Use literature such as *The Wonderful Pigs Of Jillian Jiggs* by Phoebe Gilman. Ask a student to show various ways to count the pigs.

❑ Invite students to use calculators to count. For example, as some students place cookies into a bag and count aloud, others may repeatedly add one on calculators to keep track electronically.

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Suggestions for Assessment

Interview

A2.3 Line up 7 boys and 3 girls. Ask: What must be changed to make the number of girls equal to the number of boys?

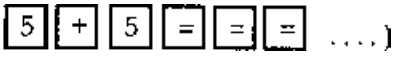
Presentation

A1.8 Have students, working in groups of 4, write down their favourite names (not their own). Ask them which name has the most/least letters. Have them share their findings with another group.

Performance

A3.1 Ask the student to count backwards starting at 8.

A3.2 Ask the student to count aloud to 50 by 5s while using the counting constant of the calculator.

(The keystrokes might be )

A3.3 Ask students to count a large number of items in a photo. Observe how they count.

Resources

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Outcomes

KSCO: By the end of grade 3, students will be expected to

i) construct and communicate number meanings, and explore and apply estimation strategies, with respect to whole numbers

SCO: By the end of grade 1, students will be expected to

A4 sort sets based on number

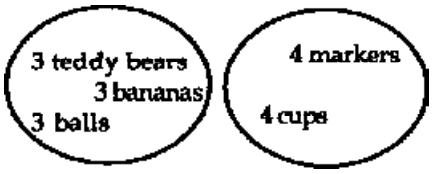
A5 match quantities with numerals

There is a difference between being able to count ... and knowing what counting tells. When we count a set, the last number word used is the name of the "manyness" of the set or the "cardinality" of the set. (Elementary School Mathematics, p. 88)

Suggestions for Teaching and Learning

A4 To demonstrate an understanding of the concept of number (e.g., "3"), students must be able to distinguish sets which have three items from those which do not. They should be presented with situations similar to the following, and asked why they think the sets are grouped as they are.

As well, include situations in which sets have the same number of items but differ in the amount of physical space they cover.



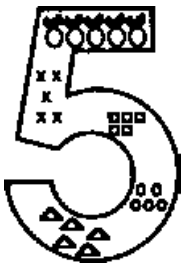
❑ Have students look around the room to find as many sets as possible containing a given number of items; for example, find sets which contain exactly 2 items.

A5 Using numerals is society's way of communicating about number size. It is important, therefore, that students become familiar with these standard symbols at this time. Students need to

- create or collect sets, given a numeral
- assign numerals to sets

Some students will need additional practice recording numerals. Tactile experiences such as tracing numerals and copying them are useful.

❑ Provide a large cutout or drawing of a numeral (e.g., 5).
Invite children to create a collage of sets representing that numeral by gluing on pictures or drawings.



GCO A: Students will demonstrate number sense and apply number-theory concepts.

Suggestions for Assessment

Performance

A4.1 Ask students to find a number of pictures, making sure that each picture shows the same amount.

Paper and Pencil

A4.2 Have students work in pairs and make a list (words or drawings) of all the things they can think of that come in twos.

Interview

A3.4 Ask: If you count by twos, starting at 0, will you say 7? Why or why not?

A4.3 Show students a set of 3 small items, a second set of 4 small items and a third set of 3 large items. Ask: What set might not belong? Why?

Presentation

A4.4 Ask students to work in pairs to decide if there are more items in the room that come in 3s or 4s. Have them share their findings with other groups.

A4.5 Ask students to describe and act out parts of a story in which there are several groups with the same number of items in them (e.g., 3 bowls, 3 chairs, 3 beds in "Goldilocks and the Three Bears").

A5.1 Use attribute blocks. Ask a student to make sets of
- 8 different shapes
- 4 blue triangles
- 5 yellow shapes, etc.

A5.2 Provide several sets of varying quantities and a set of numeral cards. Ask the student to match the appropriate cards with the sets.

A5.3 Provide string and pasta. Ask the student to make a "6" bracelet, using 6 pasta pieces.

Resources

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Outcomes

KSCO: By the end of grade 3, students will be expected to

i) construct and communicate number meanings, and explore and apply estimation strategies, with respect to whole numbers

SCO: By the end of grade 1, students will be expected to

A6 count beyond 10 in a variety of ways

A7 estimate amounts between 10 and 100

Suggestions for Teaching and Learning

A6 Students should experience a wide variety of situations which require counting beyond 10. (Students will be expected, however, to deal only with 2-digit numbers at this grade level.) Include

- skip counting by 2s, 5s, 10s (starting from 0, as well as from other numbers)
- counting using coins (pennies, nickels, dimes)
- counting on from a given number
- counting back from a given number

(Note: This outcome is an extension of SCO A3.)

A chart showing the numbers from 1 to 100 in lines of 10 (a hundreds chart) is an excellent tool for these activities. For example, when skip counting by 5s, students might put a counter on every 5th number, reading the number as the counter is placed on it.

- Ask students to use the repeat function on the calculator to skip count to a target number. For example: If you start at 0 and want to end on 40, by which number(s) could you skip count? What if you started at a different point? What if you wanted to end at a different point?

A7 Students should be provided with collections of objects (e.g., marbles, bread tags, counters, pop bottle tops) and asked to estimate the size of the group. For small groups, ask: Is it closer to 5 or 10? For large collections, one might be asking whether the group is closer to 20 or 50. The ability to estimate should develop with regular practice over the course of the year, with larger collections being examined later in the year.

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Suggestions for Assessment

Performance

A6.1 Provide approximately 40 counters. Ask the student to find a way to determine how many there are without saying each number, 1, 2, 3, . . .

A7.1 Show a collection of about 30 counters and ask the students to estimate the number in the group.

Interview

A5.4 Ask the student to tell 3 things about the number 3.

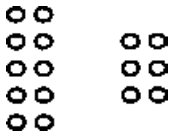
A6.2 Present 14 items to the student. Ask: How many would there be if there were 2 more? How did you find the answer?

A6.3 Show 32 scattered objects and then another 32 objects grouped into 3 groups of ten, plus two. Ask: How do the amounts compare? Which is easier to count? Why?

A6.4 Ask the student to begin counting at 13 and stop at 25.

A6.5 Provide a hundreds chart. Tell the student: I counted from 10 to 50 and only said 5 numbers. What do you think I said?

A6.6 Arrange counters as shown and observe students as they count them.



A6.7 Tell the student: I said, "10, 20, 25" when I was counting some coins. What coins do you think I had?

A7.2 Ask the student why it might be easier to estimate the size of a group of 13 counters than a group of 49 counters.

Resources

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Outcomes

KSCO: By the end of grade 3, students will be expected to

ii) concretely explore common fractions and decimals in meaningful situations

SCO: By the end of grade 1, students will be expected to

A8 demonstrate an understanding of simple fractional parts

Suggestions for Teaching and Learning

A8 Fractions are usually the first experience for children in which a number represents something other than a count. Children will generally need experiences with a wide assortment of materials in order to adequately develop fraction concepts. These materials include, among others, geoboards, counters, pattern blocks, egg cartons, grid paper, paper folding and circle pieces.

- One-half - Provide many and varied opportunities for students to explore the idea of one half in meaningful situations.

It is important that students understand the "sharing fairly" concept of one-half in which common objects are used (e.g, sharing a popsicle, a cookie, an apple). The emphasis should be on equal or same size parts. This "part of a whole" meaning can be extended to the "part of a set" meaning in certain situations; for example, when sharing a pizza that has been cut into 6 equal pieces, children can see that one half also means 3 of those 6 pieces.

The writing of symbols should be delayed until the fraction concept has been thoroughly explored. To record the amount in writing, it is preferable at this point for the teacher to write "3 fourths" rather than 3/4.

❑ Invite pairs of students to make square construction paper pizzas and "cut" them into various numbers of equal pieces. Ask them to determine how many pieces each of them would get if they shared the pizza fairly and to present their findings to the class. (Note: Cutting pieces of various sizes would also allow exploration of the concept of fair shares.)

- Other simple fractional parts - Explore one-fourth, one-third, and other fractional parts such as fifths, sixths, eighths, or tenths where they arise in context (e.g., pizzas cut into slices, hexagons split into 6 equilateral triangles). The "pie", "pizza" and "chocolate bar" models work well. Continue to present the "fair share" concept, stressing a whole being divided into equal shares. Emphasize fraction families; for example, if a whole is divided into four equal shares, we might discuss 1, 2, 3 or 4 of those shares, and that all of those "fourths" belong to the same family.

GCO A: Students will demonstrate number sense and apply number-theory concepts.

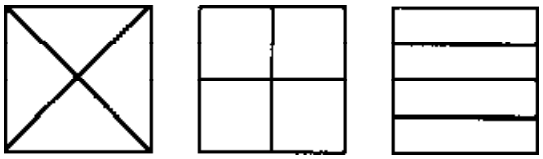
Suggestions for Assessment

Performance

A8.1 Ask students to show one-half of a group of objects.

A8.2 Ask students how to split a symmetric building (made of multilink cubes) to show halves.

A8.3 Give the students a square piece of paper and ask them to show one fourth by folding. Have the students compare their fourths. Are they the same shape? Are they all really fourths?



Interview

A8.4 Ask: Why does it not make sense to say “the bigger half?”

A8.5 Ask: When might you hear someone talk about one-half?

A8.6 Ask: What is meant when we say "2 equal parts?"

A8.7 Tell the student that sometimes we say, "She was third." Other times we say, "She gets one-third." What is the difference in the meanings of the word "third"?

A8.8 Ask the student to give an example to show when getting one-fourth of something means getting a lot, and another example to show when getting one-fourth means getting a very small amount.

A8.9 Ask a pair of students to describe a way to organize their classmates so that one-half are at the front of the room, the other half at the back. Encourage students to suggest different ways of doing it. How can they be sure that they have one-half?

Portfolio

A8.10 Ask the student to examine the picture and describe the family (tenth) shown, naming some members of that family.

Resources

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Outcomes

KSCO: By the end of grade 3, students will be expected to

ii) concretely explore common fractions and decimals in meaningful situations

SCO: By the end of grade 1, students will be expected to

A8 demonstrate an understanding of simple fractional parts (Cont'd)

KSCO: By the end of grade 3, students will be expected to

iii) read and write whole numbers and demonstrate an understanding of place value (to four places) and

(iv) order whole numbers and represent them in multiple ways

SCO: By the end of grade 1, students will be expected to

A9 order numbers and use ordinal language

Suggestions for Teaching and Learning

A8 (Cont'd)

Similarly, the tenth family includes seven-tenths (seven of those shares) and three-tenths (three of those shares). From the other perspective, if students hear “five-tenths”, they know that this is a member of the tenths family and the whole was split into ten equal fair shares.

Informal experiences will help students see that when wholes are divided into a greater number of fair shares, the shares are smaller. No formal comparison work, however, should be undertaken at this point.

Although children in subsequent grades will use "fourth" and "quarter" interchangeably, it would be inappropriate to use the term "quarter" at this stage.

A9 Students should

- use ordinal numbers to identify position (e.g., Which is 3rd?)
- relate ordinal words and symbols (e.g., third with 3rd)

(Note: By the end of grade one, students should generally be using ordinal numbers through to 10th.)

Students should also recognize the relative aspect of ordinals. In the diagram below, for example, the triangle is second if we count from the left, but third if we count from the right.

❑ The students are standing in a line. Ask: Who is eighth?

❑ Ten children are standing in a line. Ask: If ____ is fifth in line, where did I start counting?

❑ Invite children to use coloured counters to create a pattern such as

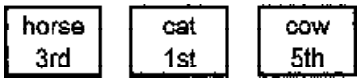
- Ask them to predict what colour a particular one will be (e.g., the 10th).
- Ask them to make a pattern in which every (4th, 5th, etc.) counter will be yellow. (See also SCO C2.)

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Suggestions for Assessment

Performance

A9.1 Ask a child to place a set of farm animals in a line by following directions given on cards; for example:



A9.2 Ask students to use counters to create a pattern in which the amount in the 4th position is less than the amount in the 3rd.

A9.3 Ask the student to make a linking cube train in which the 3rd and 5th cars of the train are different colours from the rest of the train.

A9.4 Ask the student to draw a row of shapes in which the first shape is round and the third is square. How many shapes might there be?

Interview

A9.5 Ask: What is the third thing you do when you arrive at school?

A9.6 Ask: If there are 8 people standing in line, and you are counting this way, 1st, 2nd, 3rd,..., what will you say last?

A9.7 Show a sequence of pattern blocks. Describe one of the blocks and ask the student to identify its position.

Resources

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Outcomes

KSCO: By the end of grade 3, students will be expected to

iii) read and write whole numbers and demonstrate an understanding of place value (to four places) and

(iv) order whole numbers and represent them in multiple ways

SCO: By the end of grade 1, students will be expected to

A10 explore the meaning of the numbers between 10 and 20

A11 model numbers grouped in tens and ones

Children need to be encouraged to talk and write about what they have learned ... Researchers have found that most children learn best if they discuss their work. Other studies also indicate that paper-and-pencil activities should follow extensive exploration of numerical relationships with manipulatives. (Curriculum and Evaluation Standards, Addenda Series, First-Grade Book, p. 6)

Suggestions for Teaching and Learning

A10 Before students are introduced to place-value concepts, they need opportunities to explore the numbers between ten and twenty. The uniqueness of the "teen" numbers must not be overlooked. When dealing with numbers such as 28 or 46, we "hear" the tens number first; that is, we say the "twenty" and the "forty" first. This is not the case with eleven, twelve, or the "teen" numbers. Children at this level need to understand that eleven is 10 and 1 more, twelve is 10 and 2 more, and 16 is 10 and 6 more.

The development of this concept should not be rushed, and it is not appropriate to discuss place-value concepts at this time (e.g., expecting the students to tell what the "1" in "16" represents). The "ten set," however, figures prominently in all explorations when developing number meanings for 11 - 19. Provide the students with a number of counting activities in which sets of items numbering 11 through 19 are counted. Students will be developing number sense and recognizing that certain groupings, such as a group of ten and 7 more, make it easier to determine the size of the set (a pre-place value concept).

Students might explore the usefulness of the idea of grouping by tens - for example, 24 is 20 and 4 more - again without concentrating on the positioning of the digits.

- ❑ Have students count out 10 counters on one side of a 2-part mat. Have them place 5 counters on the other side. Together count all the counters by ones. Say "Ten and five is fifteen." Turn the mat around - "Five and ten is fifteen." Repeat with other numbers without changing the 10 side of the mat. (See *Elementary School Mathematics,* p. 102.)

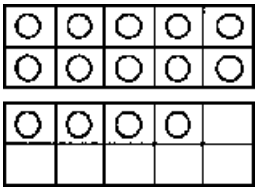
A11 Students should be encouraged to think about items that come in natural groups; for example, 5 fingers at a time when looking at hands, 4 children at a time when looking at tables of children in some classrooms. They should notice that we might say 20 fingers, but might say 4 hands, using the grouped number. Similarly, we might see 20 children, but we might think of it as 5 tables of children. This grouping idea naturally leads into grouping by 10, the value upon which our place-value system is based.

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Suggestions for Assessment

A10.1 Provide 2 ten-frames and counters for each student.

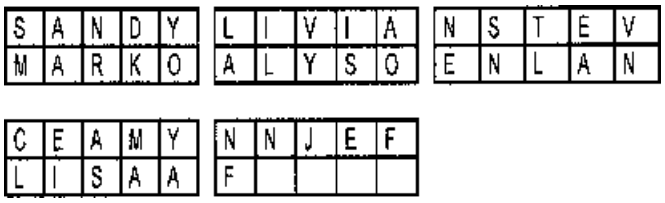
Ask the students to model fourteen with the counters. (Note: for numbers greater than 10, one ten-frame must be completely filled; for 5 and under, use the top row only.) Have them say aloud, "ten and four are fourteen." Practise with other numbers.



Observe the students as they model additional numbers.
- Do they remove all the counters?
- Do they remove all the counters on the bottom frame?
- Do they add to/remove counters on the bottom frame?
- Are they able to verbalize appropriately?

A11.1 Give the student 45 coffee stir sticks. Ask him/her to bundle them in groups of ten. Ask: How many sticks are there? Note how the student responds. Is he/she counting by groups of ten? considering this easier than counting by ones? demonstrating that there are really 45 sticks altogether?

A11.2 Ask the students to record the letters of the alphabet, or the names of some of their classmates, in ten-frames without leaving any spaces; for example:



Ask: How many letters are there in all?

A11.3 Have students play a game in which the roll of a die tells how many pennies they can accumulate. Once they have 5 pennies, they must exchange them for a nickel. The first player with 5 nickels wins the game. As the students play, ask questions; for example, I see 2 nickels and 3 pennies. How many pennies is that worth?

A11.4 Show a number of base-ten unit cubes (34, for example). Beside these show 5 rods and 6 unit cubes. Ask: Which has more? Is one easier to count than the other? Explain.

Resources

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Outcomes

KSCO: By the end of grade 3, students will be expected to

iii) read and write whole numbers and demonstrate an understanding of place value (to four places) and

(iv) order whole numbers and represent them in multiple ways

SCO: By the end of grade 1, students will be expected to

A11 model numbers grouped in tens and ones (Cont'd)

Children need to be encouraged to talk and write about what they have learned ... Researchers have found that most children learn best if they discuss their work. Other studies also indicate that paper-and-pencil activities should follow extensive exploration of numerical relationships with manipulatives. (Curriculum and Evaluation Standards, Addenda Series, First-Grade Book, p. 6)

Suggestions for Teaching and Learning

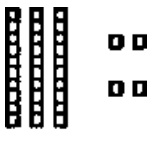
A11 (Cont'd) After exploring a variety of grouping sizes, students should begin to concentrate on grouping by tens. Proportional, groupable models should be used first, that is, materials which can be put together or taken apart to make (or unmake) tens which are ten times the size of the ones. Suggested materials are Popsicle sticks which can be placed together by rubber bands in groups of 10, linking cubes which can be connected to make strips of 10, or 10 beans which can be bagged or placed in cups.

It is important that this stage not be rushed. Many problems that children later encounter with place-value concepts are believed to stem from inadequate attention to early place-value activities. The major objective here is helping the children make that important connection between all that they know about counting by ones and the concept of grouping by tens.

- Give each student a different number (e.g., 25, 36, 42, 48 . . .) of counters. Ask: How many do you have? Ask students to combine their counters in groups to make it easier for a classmate to count them; for example, 25 might be grouped as 5 groups of 5 or 36 as 7 groups of 5 and 1 more or 3 groups of 10 and 6 more. Have half the class go from desk to desk counting the number of counters each classmate has. The other half of the class then takes its turn. Encourage a variety of oral counting (e.g., for 36: 1, 2, 3, . . ., 34, 35, 36 OR 5, 10, 15, 20, 25, 30, 35, 36 OR 10, 20, 30, 31, 32, 33, 34, 35, 36, depending on the size of the group).

  Students should proceed from the "groupable" model to a "pre-grouped" proportional model. The size of the ten model continues to be equivalent to 10 of the ones models; the difference is that the ten cannot be separated into individual ones. Examples are 10 beans glued to a stick, Cuisenaire rods, or base-ten rods.

- Ask students to (Example:)
  - model numbers using pre-grouped materials
  - record numbers from an existing model
  - show how to count an amount that is modelled

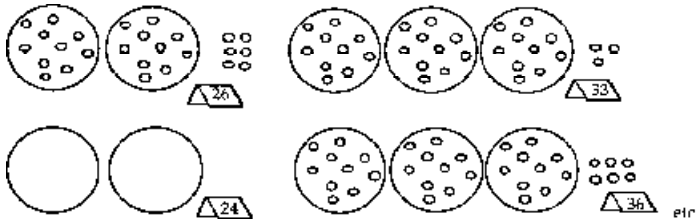


34

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Suggestions for Assessment

A11.5 Math Centre: Set out a number of arrangements of beans grouped by tens and individual units. Also have some empty stations. Provide the students with a set of prepared number cards. Direct them to place the matching card in front of the appropriate display and to build the arrangements for the other cards. Use, for example, 13, 16, 18, 24, 26, 28, 33, 36, 38, and 40.



You may wish to do a grouping activity such as this in which students are asked to determine the number of raisins in a small package or the number of M & M's in a bag.

Extensions would include using groupable and pregrouped proportional models and asking students to identify the number by matching the cards and displays. Take the opportunity to discuss with the students not only how they "counted," but the advantage of grouping in this manner.

Resources

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Outcomes

KSCO: By the end of grade 3, students will be expected to

iii) read and write whole numbers and demonstrate an understanding of place value (to four places) and

(iv) order whole numbers and represent them in multiple ways

SCO: By the end of grade 1, students will be expected to

A12 compare 2-digit numbers

Note: A variety of concrete materials can and should be used to model numbers, and to "group" into tens and ones. For example, beans and other small objects might be collected and grouped 10 to a yogurt cup, a jar lid, etc.

Suggestions for Teaching and Learning

A12 Students encounter many numbers in context. These contexts help them develop an understanding of number size. For example, a student might be asked: Which number probably tells how old your classmate's dad might be – 5, 35, 85? How do you know?

When comparing two numbers, students might make use of benchmarks as reference points. For example, 48 < 95 since 95 is closer to 100; 37 > 27 since 37 is more than 30 and 27 is less than 30. This reasoning process will help develop number sense.

Frequently, students will refer to the number of tens in a number in order to compare it to another. For example, 47 > 21 since 47 is more than 4 tens, but 21 is only a bit more than 2 tens. This type of language is preferable to language such as "4 is more than 2 so 47 is greater," particularly since children should focus on the fact that the 4 in 47 is 40 and not 4 and the 2 in 21 is 20 and not 2.

The hundreds chart is a particularly valuable reference device for number comparison since students easily learn that down and right means greater. However, it is also important for students to see concrete models of numbers (e.g., using base-ten blocks) to get a visual sense of the difference in size of the numbers being compared.

Students should recognize

- that every 2-digit number is greater than every 1-digit number
- that to compare 2-digit numbers, the tens digit is the most vital element of the number
- situations in which the units digit is important in comparing numbers (e.g., 32 vs 34)

❑ Provide cards with 2-digit numbers, such as

. . .

Pairs of students each select a card and model the number with centimetre cubes. After counting to verify, they join cubes together and cut pieces of string of equal length. Numbers can then be compared for size by comparing the length of the pieces of string.

GCO A: Students will demonstrate number sense and apply number-theory concepts.

Suggestions for Assessment

Performance

A12.1 Ask a student to use a model to show why 42 is greater than 29.

A12.2 Provide 9 base-ten rods and 9 unit cubes. Have the student create two different amounts, each using exactly 5 of the objects provided. Ask: Which amount is greater than the other? How is it possible to use the same number of objects, but still have one greater than the other?

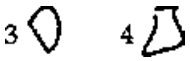
Paper and Pencil

A12.3 Provide a teacher-made "flyer" in which prices are less than a dollar. Ask the student to circle the item that costs the most (the least, more than 50 cents, etc.).

Interview

A12.4 Ask the student to use a hundreds chart to explain the relative positions of the numbers 36 and 52.

A12.5 Show students a paper on which the units digits of two numbers are smudged; for example,



Ask: Can you tell which number is greater? Why?

A12.6 Ask: Is a number with a 7 in it always greater than a number containing only digits less than 7? Explain.

Presentation

A12.7 Have pairs of students discuss when they might want to compare the sizes of two numbers and present their ideas to the class.

A12.8 Have students work in small groups to list some situations in which they would rather have 22 than 28 (e.g., golf score, race time, brussel sprouts).

Resources

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