Subtraction

Lesson plan and teacher's notes · Grade 2 Mathematics · 2 periods of 40 minutes

School	(write school name)	**Teacher**	(write name)
Date	(date)	**Class**	Grade 2
Subject	Mathematics	**Enrolment**	Boys ___ Girls ___ Total ___
Time	80 minutes	**Topic**	Subtraction

Learners with visual impairment subtract with counters, bundles and tactile place value mats: two-digit numbers with borrowing, three-digit numbers vertically, expanded notation, and subtraction without regrouping, then explore number trees, magic squares and number games. Two periods of 40 minutes.

Specific outcomes

By the end of the lesson, learners should be able to:

1. Subtract numbers up to 99 including borrowing
2. Subtract numbers up to 999 vertically
3. Subtract using expanded notation
4. Use number trees, magic squares and number games to subtract

Prior knowledge

- Learners can subtract without borrowing, such as 45 take away 23
- Learners know hundreds, tens and ones
- Learners can use an abacus or counters

Teaching and learning materials

- Counters, bottle tops, stones, beans and sticks tied in bundles of ten and a hundred
- Abacus or Braille number cards
- Tactile place value mat with raised lines and Braille labels
- 3 by 3 tactile grid or peg board
- Dice and cards for number games
- Chalk and board

References

Ministry of Education (CDC) Grade 2 Mathematics syllabus and module; 25Schools learners' note: Subtraction.

Lesson development

Stage and time	Teacher activities	Learner activities
Borrowing up to 99 20 min	Ask: What is 45 take away 23. Show 32 take away 15 with 3 bundles of ten and 2 loose counters. Say: We cannot take 5 ones from 2 ones, so we borrow 1 ten and change it into 10 ones. Break one bundle into 10 counters to make 12 ones. Subtract 12 take away 5 is 7, then 2 take away 1 is 1. The answer is 17. Pairs then solve 41 take away 26, 53 take away 28 and 62 take away 37, one explaining while the other solves.	Represent numbers, borrow physically, subtract and say the answer aloud.
Vertical subtraction up to 999 25 min	Tell the story of a shop with 356 sweets that sold 124. Learners build 356 with hundreds, tens and ones and remove 124. Demonstrate the vertical layout and subtract ones, tens, then hundreds to get 232. Pairs solve 245 take away 123, 678 take away 456 and 532 take away 211. Then introduce regrouping with 402 take away 187: exchange 1 hundred for 10 tens and 1 ten for 10 ones.	Work in pairs, use objects first then numbers, and explain each step.
Expanded notation 20 min	Tell the story of 468 oranges with 235 taken away. Break the numbers: 468 is 400 and 60 and 8, 235 is 200 and 30 and 5. Subtract each part: 400 take away 200, 60 take away 30, 8 take away 5. Show the group borrowing of 402 take away 187 as 300 and 90 and 12 take away 100 and 80 and 7. Pairs use abacus, Braille cards or place value boards for 356 take away 124 and 589 take away 243, then 401 take away 189 and 500 take away 276.	Expand numbers, subtract each place value, combine and describe each step.
Without regrouping and strategies 15 min	Use the story of Chipo, who had 345 groundnuts and gave away 123. Remove objects on the place value mat. Learners then solve 456 take away 234 and 789 take away 123. Introduce number trees by breaking 345 into 300 and 40 and 5, the 3 by 3 grid where rows and columns give the same answer, and simple games with dice, cards or counters.	Touch and count grouped objects, take them away and play the games.

Teacher's content notes

Read these before the lesson. They are what you need to know, not what to copy onto the board.

Borrowing

Borrowing is taking 1 from the next place value. 1 ten becomes 10 ones and 1 hundred becomes 10 tens. Borrow only when the digit on top is too small.

Expanded notation

Expanded notation writes a number showing the value of its digits: 468 is 400 and 60 and 8. Subtract each place value and combine the answers.

Strategies

Number trees break a number into parts. A magic square is a 3 by 3 grid where rows and columns must give the same answer after subtraction. Number games use dice, cards or counters.

Questions to ask during the lesson

Question	Expected answer
The teacher shows 32 as 3 bundles of ten and 2 counters and asks a learner to take away 15. The learner is stuck. (a) Can we take 5 ones from 2 ones. (b) What can we do. (c) How many ones do we then have.	(a) No. (b) Borrow 1 ten and change it to 10 ones. (c) 12.
A shop had 356 sweets and 124 were sold. Chanda arranges the numbers vertically. (a) Which place is first. (b) What is 6 take away 4. (c) What is the answer.	(a) Ones. (b) 2. (c) 232.
The teacher writes 468 as 400 and 60 and 8 on the board. A group copies it. (a) What is this way of writing called. (b) How is 235 written. (c) What is 400 take away 200.	(a) Expanded notation. (b) 200 and 30 and 5. (c) 200.

Worked examples for the board

32 take away 15

Step 1: Show 3 tens and 2 ones. Step 2: Borrow 1 ten to make 12 ones. Step 3: 12 take away 5 is 7. Step 4: 2 tens take away 1 ten is 1 ten. Step 5: The answer is 17.

468 take away 235

Step 1: Write 468 as 400 and 60 and 8 and 235 as 200 and 30 and 5. Step 2: 400 take away 200 is 200. Step 3: 60 take away 30 is 30. Step 4: 8 take away 5 is 3. Step 5: The answer is 233.

Board plan

Write the title Subtraction. Write 32 take away 15 with the borrowing steps. Write 356 take away 124 vertically. Write 468 as 400 plus 60 plus 8. Add the rule: start with ones, then tens, then hundreds, and borrow when needed.

Sum	Working	Answer
32 take away 15	Borrow 1 ten: 12 take away 5 is 7, 2 take away 1 is 1	17
356 take away 124	6 take away 4, 5 take away 2, 3 take away 1	232
468 take away 235	400 take away 200, 60 take away 30, 8 take away 5	233

The finished board

Mistakes to expect

Learners often think	Put it right
We always take the smaller digit from the bigger digit.	Use 32 take away 15 with counters. We cannot take 5 from 2, so we borrow a ten. Let learners do it physically.
After borrowing the tens stay the same.	Show that one bundle of ten was broken, so there is 1 fewer ten. Count the bundles again.
Start from the hundreds.	Show that borrowing moves from the next place, so start with the ones, then tens, then hundreds.

Differentiation

Learners who struggle

Start with two-digit numbers and only 3 bundles and a few loose counters. Let learners break a bundle themselves and count the ones aloud.

Learners who finish early

Ask learners to write their own story problem for 600 take away 278 and solve it in expanded notation.

Hearing or visual impairment

For learners with a visual impairment, use raised lines, Braille labels, abacus and objects that can be touched. Let them answer orally or in Braille and allow extra time.

No projector, no printing

Use sticks tied with grass for tens and hundreds, and stones, seeds or bottle tops for ones. Draw the place value mat in the sand with raised lines.

If time is short

Keep borrowing up to 99 and vertical subtraction. Move expanded notation with borrowing and the games to the next lesson.

Evaluation

Question or task	A correct answer shows
Mulenga had 45 mangoes and gave away 18. His teacher asks him to solve it with bundles and counters. (a) Do we need to borrow. (b) Why. (c) How many mangoes are left.	(a) Yes. (b) 8 ones cannot be taken from 5 ones. (c) 27.

A shop had 356 sweets and sold 124. A learner uses the place value mat to find how many are left. (a) Which place is subtracted first. (b) What is 5 take away 2. (c) How many sweets are left.	(a) The ones. (b) 3. (c) 232.

Homework

A farmer harvested 825 maize cobs and sold 347 at the market. Bupe is asked by her father to find how many are left. (a) Do we need to borrow. (b) Write the numbers vertically and say the first step. (c) How many cobs remain.

Extra practice with answers

Question	Answer
1. A shop had 60 sweets and 27 were sold. A learner uses counters to find how many are left. (a) Do we need to borrow. (b) What do we change the borrowed ten into. (c) How many sweets are left.	(a) Yes. (b) 10 ones. (c) 33.
2. Chipo had 345 groundnuts and gave her friend 123. The teacher asks the class to use the place value mat. (a) Do we need to borrow. (b) What is 345 take away 123. (c) Which place do we start with.	(a) No. (b) 222. (c) The ones.
3. A teacher gives learners 456 take away 123 using bundles of hundreds, tens and ones. A group solves it. (a) What is 6 take away 3. (b) What is 5 take away 2. (c) What is the answer.	(a) 3. (b) 3. (c) 333.
4. A basket had 468 oranges and 235 were taken away. The teacher asks for expanded notation. (a) Write 468 in parts. (b) What is 60 take away 30. (c) How many oranges are left.	(a) 400 and 60 and 8. (b) 30. (c) 233.

Answers to the learners' check-yourself questions

1. Why do we borrow when we take 5 from 2 ones.
   Because there are not enough ones, so we change 1 ten into 10 ones.
2. What is 356 take away 124.
   232.
3. Write 468 in expanded notation.
   400 and 60 and 8.
4. Which place do we subtract first.
   The ones.
5. Mulenga has 45 mangoes and gives away 18. His teacher asks how many are left. (a) Do we need to borrow. (b) Why. (c) How many mangoes are left.
   (a) Yes. (b) We cannot take 8 ones from 5 ones. (c) 27.
6. A farmer harvested 825 maize cobs and sold 347. A learner is asked to find how many remain. (a) Which place do we start with. (b) Do we borrow. (c) How many cobs remain.
   (a) The ones. (b) Yes. (c) 478.

Teacher's reflection

What went well:

What I will change next time:

Learners who need follow-up: