Example assessment task
Level 3 – Addition and subtraction

Overview

The processes of partitioning, rearranging and regrouping (renaming) are used in conjunction with single-digit number facts and understanding of place value to add and subtract two- and three-digit natural numbers.

This involves a progression of learning and applying:

* part-whole strategy, applying place value (adding and subtracting multiples of 10, within 100 and then beyond 100)
* place-value-based strategy to add without renaming tens and ones
* place-value-based strategy to subtract without renaming tens and ones
* place-value-based strategy to add with renaming tens and ones
* place-value-based strategy to subtract with renaming tens and ones.

This example assessment task requires students to apply their knowledge and skills to solve practical problems involving addition and subtraction of two- and three-digit natural numbers. This includes:

* modelling situations and formulating problems involving addition and subtraction
* partitioning, rearranging or regrouping two- and three-digit numbers
* decomposing or renaming numbers to support calculations
* recognising when there is a more efficient process to add or subtract
* solving practical problems using these processes and interpreting solutions in context.

Curriculum connection (Victorian Curriculum Mathematics Version 2.0)

|  |  |
| --- | --- |
| Level 3 achievement standard (linked sentences) d | Level 3 content description |
| They partition, rearrange and regroup two- and three-digit numbers in different ways to assist in calculations.Students extend and use single-digit addition and related subtraction facts and apply additive strategies to model and solve problems involving two- and three-digit numbers.  | add and subtract two- and three-digit numbers using place value to partition, rearrange and regroup numbers to assist in calculations without a calculatorVC2M3N04 |

Equipment and duration

The example assessment task is designed to be completed individually and completed over 1 to 2 lessons of 60-minute duration.

Students may require manipulatives to represent their thinking, such as number lines, base-10 materials or place value mats.

Assessment task, with teacher notes

Question 1

A school wants to hire 2 buses to take students and teachers to a swimming pool for swimming lessons.

The bus operator checks the availability of 2 of their buses. The table below shows how many people were travelling by bus on Monday to Friday of a particular week.

|  |  |  |
| --- | --- | --- |
| Day | Bus A | Bus B |
| Monday | 50 | 60 |
| Tuesday | 55 | 70 |
| Wednesday  | 73 | 46 |
| Thursday  | 68 | 34 |
| Friday | 73 | 59 |

Use the information in this table to answer the following questions for this particular week.

1. How many people were travelling by bus each day?
2. Which day had the least number of people travelling by bus?
3. Which day had the greatest number of people travelling by bus?
4. If Bus A could hold up to 80 people, how many empty seats did this bus have on Monday?
5. If Bus B could also hold up to 80 people, how many empty seats were there on this bus on Thursday?
6. What is the difference between the greatest number of people and the least number of people on Bus B during that week?

Teacher notes

This part of the task addresses the aspect of the achievement standard ‘partition, rearrange and regroup two- … digit numbers in different ways to assist in calculations’. The number of passengers on each bus, Bus A and Bus B, have been developed so that each row introduces a slightly more sophisticated skill with respect to two-digit addition. Further to this, Question 1 parts **i.**–**iii.** involve addition only, while parts **iv.** and **v.** involve subtraction only. Part **vi.** requires that students correctly identify the greatest and least number of people travelling on Bus B during the week and set up the subtraction in the correct order.

Students could represent their calculations using number lines, base-10 materials, place value charts, bar models and algorithms. Using a combination of these might reveal areas or gaps in thinking that may not otherwise be observed, or indicate steps for further learning.

This task involves:

adding multiples of 10 (calculating the total of passengers for Monday and Tuesday)

rearranging tens and ones to add two-digit numbers using place-value understanding

regrouping ones and tens to add two-digit numbers

subtracting multiples of 10 within 100 (part **iv.**) and beyond 100 (part **v.**)

subtracting tens and ones using regrouping (part **vi.**)

drawing on basic facts to generalise and apply to two-digit addition and subtraction

selecting a strategy to calculate two-digit addition and subtraction.

Question 2

When the school coordinator contacted the bus operator to make the booking, she was advised of the following hire fees:

|  |  |  |
| --- | --- | --- |
| Bus type | Maximum number of passengers  | Cost per hour |
| Minibus | 20 | $90 |
| Charter | 60 | $148 |
| Double-decker | 80 | $175 |

Use the information in this table to answer the following questions:

**a.** How many people could be transported each trip if the school hired:

1. a minibus and 2 charter buses
2. 2 minibuses and one double-decker bus
3. a charter bus and a double-decker bus
4. 2 double-decker buses?

**b.** What would be the daily hire cost for 2 hours a day if the school hired:

1. a minibus and 2 charter buses
2. 2 minibuses and one double-decker bus
3. a charter bus and a double-decker bus
4. 2 double-decker buses?

**c.** The school coordinator decided to hire 2 double-decker buses for every day the classes are at swimming. Discuss the advantages and disadvantages of this decision, explaining your thinking.

Teacher notes

This part of the task addresses the aspect of the achievement standard ‘partition, rearrange and regroup two- and three-digit numbers in different ways to assist in calculations’ within a financial context.

It involves:

adding three-digit numbers using place-value understanding with and without renaming

multi-step process to complete an addition problem

using known facts to generalise with two-digit addition (e.g. double 9 is 18 so double 90 is 180)

evaluating the outcome from a set of calculations.

► A student version of the assessment task has been included in the following pages.

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