Time and Area

Lesson plan and teacher's notes · Grade 4 Mathematics · 2 periods of 40 minutes

School	(write school name)	**Teacher**	(write name)
Date	(date)	**Class**	Grade 4
Subject	Mathematics	**Enrolment**	Boys ___ Girls ___ Total ___
Time	80 minutes	**Topic**	Time and Area

Learners find elapsed time using subtraction, relate seconds, minutes, hours and days with a stopwatch and daily routines, show area with nonstandard units, and choose suitable standard units for area. Two periods of 40 minutes.

Specific outcomes

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

1. Determine the time that passes between events
2. Relate seconds, minutes, hours and days
3. Illustrate area using nonstandard units
4. Choose mm², cm² or m² to suit a surface

Prior knowledge

- Learners can subtract whole numbers
- Learners can read a clock

Teaching and learning materials

- Clock face, wall clock, digital watch
- Stopwatch
- Square paper grids, tiles or bottle tops
- Pieces of paper representing 1 mm², 1 cm² and 1 m²
- Rulers, markers, manila paper
- Computer or tablet and projector if available

References

Ministry of Education (CDC) Grade 4 Mathematics syllabus and module; 25Schools learners' note: Time and Area.

Lesson development

Stage and time	Teacher activities	Learner activities
Period 1 Elapsed time 20 min	Give a school-day timetable (assembly 07:30, break 10:00, lunch 12:30, closing 15:00). Guide learners to work out time between each event using subtraction, then present in pairs. Pose: a bus leaves Monze at 08:15 and arrives in Mazabuka at 11:45, how long was the journey. Discuss strategies such as breaking the time into hours and minutes.	Subtract times and present.
Period 1 Units of time 20 min	Stopwatch challenge: time how long it takes to clap 20 times, convert the result into seconds, then minutes. Learners list daily activities (cleaning 1 hour, sleeping 8 hours, studying 2 hours) and convert durations between units.	Time claps and convert durations.
Period 2 Area with nonstandard units 20 min	Give square paper grids. Learners cover a rectangular area such as the teacher's desk and count the units used. If ICT exists, overlay squares on a rectangle on screen and compare the count with bottle tops on a real desk. Ask what happens with bigger and smaller squares and highlight that the choice of unit changes the number but the area remains the same. Learners compare shapes covering more or fewer unit squares.	Cover surfaces and count units.
Period 2 Standard units 20 min	Give pieces of paper representing 1 mm^2, 1 cm^2 and 1 m^2. Use the school garden task: which unit suits the space between plants, a mobile phone or exercise book, and the school garden or classroom floor. In groups, match a chair seat, a desk top and a classroom floor to mm^2, cm^2 or m^2 and explain why different units are used.	Match surfaces to suitable units and explain.

Teacher's content notes

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

Time

Time is measured in seconds, minutes, hours and days. Elapsed time between events is found by subtraction.

Area

Area is how much space a surface covers. It can be shown with nonstandard units such as grids, tiles and bottle tops. The choice of unit affects the number but the area remains the same. Highlight consistency in unit size.

Standard units

Standard units of area are mm^2, cm^2 and m^2. Choose a unit that suits the size of the surface.

Questions to ask during the lesson

Question	Expected answer
The teacher asks the class how many minutes pass between assembly at 07:30 and the first lesson at 08:00 on a normal school day. (a) What do we do to find the time. (b) How many minutes pass. (c) What do we call this time.	(a) Subtract. (b) 30 minutes. (c) Elapsed time.
The teacher gives a learner a stopwatch to time 20 claps and the learner counts 30 seconds. (a) How many seconds. (b) How many minutes is that. (c) Which unit is bigger.	(a) 30. (b) Half a minute. (c) Minutes.
The teacher asks the class how many tiles are needed to cover the classroom floor and shows a small tile and a big tile. (a) Which tile needs a bigger count. (b) Does the area change. (c) Why must the tiles be the same size.	(a) The small tile. (b) No. (c) So the count can be compared.

Worked examples for the board

Time of a bus journey

Step 1: Write the start time 08:15 and the end time 11:45. Step 2: From 08:15 to 11:15 is 3 hours. Step 3: From 11:15 to 11:45 is 30 minutes. Step 4: The journey is 3 hours 30 minutes.

Area of a desk top

Step 1: Take paper squares of the same size. Step 2: Cover the desk top without gaps. Step 3: Count the squares. Step 4: Say the area in squares.

Board plan

Write the title Time and Area. Write the bus journey as a subtraction and the three area units mm^2, cm^2 and m^2 with an example of each.

Surface	Suitable unit
Space between plants	mm^2
Exercise book	cm^2
Classroom floor	m^2

The finished board

Mistakes to expect

Learners often think	Put it right
A bigger count of tiles always means a bigger surface.	Show that bigger tiles give a smaller count for the same surface, so the unit must be the same size.
Time passed is found by adding the two times.	Show on the clock that we subtract the earlier time from the later time.

Differentiation

Learners who struggle

Use only full-hour differences first, then add half hours.

Learners who finish early

Ask learners to cover two desks with tiles of different sizes and explain why the counts differ but the area is the same.

Hearing or visual impairment

Give learners large or tactile grids and tiles. Pair learners who find subtraction hard with a helper and use a clock model to count on.

No projector, no printing

Use drawn grids, paper squares, stones or bottle tops, and a clock drawn on a plate.

If time is short

Keep elapsed time and the choice of area units. Move the stopwatch activity to the next lesson.

Evaluation

Question or task	A correct answer shows
A bus leaves Monze at 08:15 and arrives in Mazabuka at 11:45. The teacher asks Bupe to explain how long the journey was. (a) How many whole hours. (b) How many extra minutes. (c) What is the total.	(a) 3. (b) 30. (c) 3 hours 30 minutes.
A carpenter in Lusaka is making a chair seat, a desk top and a classroom floor for a school and asks Mwamba which units to use. (a) Which unit for the classroom floor. (b) Which unit for an exercise book. (c) Why not use the same unit for everything.	(a) m^2. (b) cm^2. (c) The surfaces are very different in size.

Homework

Njavwa's school day starts with assembly at 07:30 and the school closes at 15:00. She also wants to cover her small exercise book with paper squares. (a) How long is it from 07:30 to 15:00. (b) What unit would she use for the book. (c) What must she do about the size of the squares.

Extra practice with answers

Question	Answer
1. On a school day, lunch is at 12:30 and closing is at 15:00, and Mulenga wants to know how long the afternoon is. (a) What operation does he use. (b) How many hours and minutes pass. (c) What do we call this time.	(a) Subtraction. (b) 2 hours 30 minutes. (c) Elapsed time.
2. Chanda lists her day: cleaning the house for 1 hour, sleeping for 8 hours and studying for 2 hours. Her teacher asks her to add the hours spent. (a) How many hours is that in total. (b) Which activity is the longest. (c) Which is the shortest.	(a) 11 hours. (b) Sleeping. (c) Cleaning the house.
3. A teacher covers a desk with 24 paper squares and then repeats it with squares twice as big. Bupe is asked what changes. (a) Will the count be bigger or smaller. (b) Does the area change. (c) What must we keep the same.	(a) Smaller. (b) No. (c) The size of the unit.
4. A carpenter in Lusaka makes a desk top, a chair seat and a classroom floor. The learners decide on units. (a) Which unit suits the classroom floor. (b) Which suits a phone. (c) Which suits the space between tiny plants.	(a) m². (b) cm². (c) mm².

Answers to the learners' check-yourself questions

1. How do we find the time between two events.
   Subtract the earlier time from the later time.
2. What is area.
   How much space a surface covers.
3. Name three standard units of area.
   mm², cm² and m².
4. Which unit suits a classroom floor.
   m².
5. A bus leaves Monze at 08:15 and arrives in Mazabuka at 11:45. Mulenga's uncle wants to know how long the trip lasted. (a) How many hours from 08:15 to 11:15. (b) How many minutes from 11:15 to 11:45. (c) How long was the journey.
   (a) 3 hours. (b) 30 minutes. (c) 3 hours 30 minutes.
6. Grade 4 learners at a school in Livingstone want to prepare a small vegetable garden behind their classroom with sections for tomatoes, rape and onions. The teacher asks which unit to use. (a) Which unit suits the whole garden. (b) Which unit suits an exercise book. (c) Which unit suits the space be
   (a) m². (b) cm². (c) mm².

Teacher's reflection

What went well:

What I will change next time:

Learners who need follow-up: