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Lesson Exemplar for Mathematics

Quarter 1
Lesson

1

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Lesson Exemplar for Mathematics Grade 5
Quarter 1: Lesson 1 Week 1
SY 2024-2025

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MATHEMATICS/QUARTER 1/ GRADE 5

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learner should have knowledge and understanding of the 12- and 24-hour time, and world time zones
B. Performance Standards	Use 12- and 24-hour time. (MG)
C. Learning Competencies and Objectives	1. Describe a 12- and 24-hour time. 2. Convert 12- and 24-hour time, and vice versa. 3. Solve word problems involving 12- and 24-hour time.
D. Content	1. Concepts on 12- and 24-hour time 2. Conversion of 12- and 24-hour time, and vice versa 3. Word problems involving 12- and 24-hour time
E. Integration	Valuing time Time Management

II. LEARNING RESOURCES
AM and PM – Definition, Examples, FAQs, Practice Problems. SplashLearn. https://www.splashlearn.com/math-vocabulary/am-pm Costa, D. (n.d.). 12-hour clock time convention. Britannica. https://www.britannica.com/topic/12-hour-clock Costa, D. (n.d.). 24-hour clock time convention. Britannica. https://www.britannica.com/topic/24-hour-clock Interactive Clock. Toy Theater. https://toytheater.com/clock/ Kher, A. (n.d.). What Do AM and PM Stand For? Timeanddate. https://www.timeanddate.com/time/am-and-pm.html Military Time Converter. On the Clock. https://www.ontheclock.com/convert-military-24-hour-time.aspx Telling time: AM and PM. K5 Learning. https://www.k5learning.com/free-math-worksheets/second-grade-2/telling-time/am-pm

Theisen, T. (2022, October 17). *What Is Military Time?* Military.com. Retrieved April 14, 2024, from <https://www.military.com/military-life/military-time-the-24-hour-clock.html>

12-hour and 24-hour clocks. LearnAlberta. https://www.learnalberta.ca/content/kes/pdf/or_cf_math_ss_a3_02_12hour.pdf

24-hour clock facts for kids. Kiddle Encyclopedia. Retrieved April 13, 2024, from https://kids.kiddle.co/24-hour_clock

III. TEACHING AND LEARNING PROCEDURE				NOTES TO TEACHERS
A. Activating Prior Knowledge	Day 1 1) Short Review In Grade 4, you learned about ELAPSED TIME, or the duration between two given times/moments, usually starting and ending. Do you still remember how to calculate it? Let's review the lesson on Elapsed Time by calculating the length of travel time each pupil spent going to school. Travel Time <i>How long was your travel time from home to school?</i>			Option for Travel Time: To make the activity more relevant to real life, the teacher may ask five pupils about the time they left their homes and arrived at school. Their responses will be recorded using the given table. Then, they will be asked about the length of their travel time. To integrate values, they may be asked about the advantages of going to school early. Answers: 1. Kelvin – 1 hour and 22 minutes 2. Rapha – 1 hour and 15 minutes 3. Theon – 31 minutes 4. Kim – 53 minutes 5. Gloria – 16 minutes
	Pupil	Time each pupil left home	Time each pupil arrived at school	
	Kelvin	5:30 AM	6:52 AM	
	Rapha	5:55 AM	7:10 AM	
	Theon	6:04 AM	6:35 AM	
	Kim	6:50 AM	7:43 AM	
	Gloria	7:04 AM	7:20 AM	

	To further process the activity and be able to integrate values, the teacher will ask these questions: - o If their 1st period starts at 7:30 AM, who was late for school? Answer: Kim - o How many minutes was she late? Answer: 13 minutes - o If Kim were your friend and classmate, what advice would you give her to avoid being tardy? Possible answer: To arrive on time, you must leave your house earlier than you used to. Since your travel time is almost an hour, leaving by 6:20 AM will probably do.	Other possible answers: -You sleep earlier so that you can wake up earlier, too. -You can set an alarm clock to help you wake up.
B. Establishing Lesson Purpose	1) Lesson Purpose The teacher will ask the following questions: • How many hours are there in one day? Answer: 24 hours • In an analog clock, how many hours can be seen in one complete cycle or period? Answer: 12 hours • Since an analog clock has 12 hours in one cycle, how many times does it complete a full cycle in a day? Answer: twice • In the Philippines, how do we distinguish between 10:00 in the morning and 10:00 in the evening? What notations are typically used? Answer: We typically use notations such as A.M. and P.M. to distinguish between morning and evening (afternoon included). A.M. and P.M. distinguish between morning and evening in a 12-hour time system commonly used in the Philippines. However, there is also a 24-hour time format typically used by the military and other countries. 2) Unlocking Content Area Vocabulary The 12-hour time format divides a 24-hour day into two equal cycles or periods. The first cycle is AM, which means ante meridiem (before midday) in Latin, while the second cycle is PM, which means post meridiem (after midday). The 24-hour time format tells the time of the day, from midnight to midnight, divided into 24 hours, and does not need to use AM or PM to differentiate morning, afternoon, and evening.	The teacher may show an analog clock when asking about the number of hours a cycle constitutes. The teacher may further explain that, aside from analog clocks, several digital clocks use a 12-hour time format. However, some digital clocks have settings that can be modified to turn into a 24-hour time system.

C. Developing and Deepening Understanding

SUB-TOPIC 1: DESCRIBE A 12- AND 24-HOUR TIME

1) Explicitation

Let us do this activity.

Is it AM or PM?

As a Grade 5 pupil, when do you usually do the following activities?

Activity	AM or PM?
Eating breakfast	
Taking a bath before going to school	
Praying before sleeping at night	
Playing toys with siblings/friends after school	
Doing your homework after school	
Eating dinner	

To process the activity, the teacher will call volunteers to share their answers with the class.

2) Worked Examples

Math-tanong

The 12-hour Time

- *What time format is employed when utilizing AM and PM to distinguish morning, afternoon, and evening?*

Answer/Discussion:

When using AM and PM, the 12-hour time format is employed.

There are two equal cycles or periods of 12 hours in a day.

The 1st 12-hour period/cycle refers to AM, which is from 12:00 AM to 11:59 AM, while the 2nd 12-hour period/cycle refers to PM, which is from 12:00 PM to 11:59 PM.

The teacher will call volunteers to determine the period (AM or PM) when they usually do the given activities.

- When do you usually do the following?
- Eating breakfast? **AM**
 -Taking a bath before going to school? **AM**
 -Praying before sleeping at night? **PM**
 -Playing toys with siblings/friends after school? **PM**
 -Doing homework after school? **PM**
 -Eating dinner? **PM**

Some of the expected answers are based on the assumption that Grade 5 pupils stay in school from morning until afternoon.

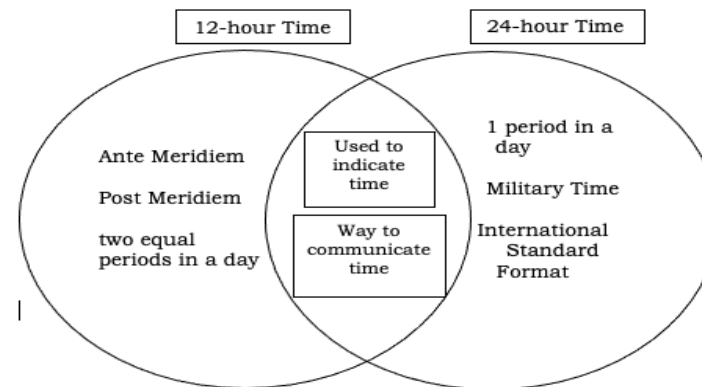
To make the Math-tanong activity more engaging, the teacher may transform it into a game-like format. How to do this?

Option 1:

- Write the set of questions on sheets of paper, in advance.

	Understanding the 12-hour time format including the appropriate use of AM and PM is essential. This can prevent misunderstandings and confusion in communication and improve our ability to manage our schedules. For instance, if you invite your classmates to your birthday party at 8:00, they need to know if it is AM or PM; otherwise, they might get confused. Another was meeting a friend I had not seen for a long time at 7:00, but she came at 7:00 AM when I meant 7:00 PM. • <i>What do the abbreviations AM and PM stand for?</i> AM = Ante Meridiem (before midday or before noon) PM = Post Meridiem (after midday or afternoon). Answer/Discussion: Hence, when we say "7:00 AM", we mean 7:00 (seven o'clock) in the morning, and when we say "7:00 PM", we refer to 7:00 (seven o'clock) in the evening. Furthermore, when we say "4:30 AM," we mean 4:30 (four thirty) in the morning, and when we say "4:30 PM", we mean 4:30 (four thirty) in the afternoon. • <i>How do we properly write AM and PM?</i> Answer/Discussion: According to <i>Britannica</i>, periods can be added or omitted, and letters can be used in lowercase or uppercase. This means we can write AM as a.m., am, and PM as p.m., pm. AM and PM can also be written as A.M. and P.M., respectively. The 24-hour Time Aside from the 12-hour time, another format can also be used. This is the 24-hour time format. • <i>What is the 24-hour time format?</i> Answer/Discussion:	• Arrange the questions in their proper order. • Put these papers in a box with holes for learners to pick them easily. • Call a volunteer to pick one question from the box and read it aloud. The volunteer will then provide his/her answer. Do this until all questions are picked. • Points may be assigned for every correct answer. Option 2: (Quiz Bee) • Make a PowerPoint presentation where questions can be found. • Divide the class into 4-5 groups. • Give each group a buzzer or anything available that helps identify who will answer first. • The first group to hit or tap their buzzer will answer the question. If they answer correctly, they will earn points. However, if they answer incorrectly, other groups will have the chance to "steal" the points by providing the correct answer. Please note that during the activity, the teacher may elaborate on essential concepts
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	According to <i>Britannica</i>, this format is known as the International Standard Time format (ISO 8601). In a 24-hour format, time starts at 00:00 and ends at 23:59, although 24:00 can also mean 00:00 the next day. • <i>Are the abbreviations AM and PM used in this format?</i> Answer/Discussion: In this format, the abbreviations AM and PM are no longer utilized since a day consists of only one 24-hour period. With only one period used, distinguishing between AM and PM is unnecessary. • <i>Where and by whom is the 24-hour clock typically used?</i> Answer/Discussion: According to <i>Britannica</i>, experts in various fields such as medicine and aviation widely use it, even in cultures where the 12-hour clock is the norm. Furthermore, this format is used in computers, public safety, and transportation. Several countries in Europe, Latin America, and Asia typically use it for writing time, while many European countries utilize it for speaking about time. The 24-hour time is also known as military time. • Is it possible to convert a given 12-hour time into 24-hour time and vice versa? Answer/Discussion: Yes. A given 12-hour time can be converted into 24-hour time and vice versa. For example, 3:00 PM in a 12-hour time is the same as 15:00 in a 24-hour time. 3) Lesson Activity Activity 1 Refer to the Worksheets for the activity which the learners will accomplish. Answers to the Lesson Activity :	and provide additional explanations for each question to enhance learners' understanding. How to read military time/24-hour time? The following links may be accessed: • https://www.learnalberta.ca/content/kes/pdf/or_cf_math_ss_a3_02_12hour.pdf • https://www.military.com/military-life/military-time-the-24-hour-clock.html How to use the Venn diagram? Venn diagrams are useful tools for representing relationships
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SUB-TOPIC 2: CONVERT 12- AND 24-HOUR TIME, AND VICE VERSA

1) Explicitation

Complete the entries in the given table that shows 12- and 24-hour time formats.

Complete the table

12-Hour Time	24-Hour Time
12:00 AM	00:00 → Midnight
1:00 AM	01:00
2:00 AM	
	03:00
4:00 AM	
	05:00
6:00 AM	
	07:00
8:00 AM	

between or among sets. They are used to emphasize similarities and differences.

The left and right sides of the diagram show the differences between terms, while the middle section represents the similarities of the terms being compared.

Answers to Subtopic 2

Explicitation:

12-Hour Time	24-Hour Time
12:00 AM	00:00
1:00 AM	01:00
2:00 AM	02:00
3:00 AM	03:00
4:00 AM	04:00
5:00 AM	05:00
6:00 AM	06:00
7:00 AM	07:00
8:00 AM	08:00
9:00 AM	09:00
10:00 AM	10:00
11:00 AM	11:00
12:00 PM	12:00
1:00 PM	13:00
2:00 PM	14:00
3:00 PM	15:00
4:00 PM	16:00
5:00 PM	17:00
6:00 PM	18:00
7:00 PM	19:00
8:00 PM	20:00
9:00 PM	21:00
10:00 PM	22:00
11:00 PM	23:00

9:00 AM	09:00
	10:00
11:00 AM	
12:00 PM	12:00
1:00 PM	13:00
2:00 PM	14:00
	15:00
4:00 PM	
	17:00
6:00 PM	
7:00 PM	19:00
	20:00
9:00 PM	
	22:00
11:00 PM	23:00
12:00 AM	00:00

→ Midday or Noon

→ Midnight

The teacher may reiterate that in a 24-hour format, time starts at 00:00 and ends at 23:59, though **24:00 can also mean 00:00 the next day.**

To further process the activity after the correct answers are given, the teacher will ask the following questions:

- How many periods/cycles does a 12-hour format have to complete in one day?
Answer: 2

	• How many periods/cycles does the 24-hour format have to complete in one day? Answer: 1 • What have you observed regarding the hours from 1:00 AM to 12:59 PM? Answer: From 1:00 AM to 12:59 PM, the hours and minutes remain the same in both 12-hour and 24-hour formats except for the omission of AM/PM in the latter. <i>Example: 9:00 AM in 24 hour clock is 09:00 12: 59 PM in 24 hour clock is 12:59</i> • What have you observed regarding conversion starting from the first hour (12:00 AM or midnight) to 12:59 AM of the day? Answer: To convert the first hour of the day from a 12-hour to a 24-hour format, subtract 12 hours and omit AM. Conversely, to convert from a 24-hour to a 12-hour format, add 12 hours and affix AM. <i>Example: 12:15 AM to 24 hour clock is 00:15 00:30 to 12 hour clock is 12:30 AM</i> • What have you observed regarding conversion from 1:00 PM to 11:59 PM? Answer: From 1:00 PM to 11:59 PM, add 12 hours to convert to a 24-hour time format. Then, omit the PM. <i>Example: 2:00 PM to 24 hour clock is 14:00</i> Conversely, from 13:00 to 23:59, subtract 12 hours to convert to a 12-hour time format. Then, affix the PM. <i>Example: 15:30 to 12 hour clock is 3:30 PM</i> 2) Worked Examples Chrono Conversion <i>What time do you do the following activities?</i>	The table in the activity, “Is it AM or PM?” will be reused and extended to integrate the lesson on converting 12- and 24-hour time formats. How to complete the table? • To complete the 2nd column (12-hour format), the teacher will ask the learners what
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Activity	Time (12-hour format)	How to write in 24-hour time format?
Eating breakfast		
Taking a bath before going to school		
Praying before sleeping at night		
Playing toys with siblings/friends		
Doing your homework after school		
Eating dinner		

Since we have already identified the specific time we will do the given activities in a 12-hour format, let us convert them into a 24-hour time format.

How is each given time written in a 24-hour time format?

Activity	12-Hour Time	24-Hour Time	How to convert from 12-hour time to 24-hour time?	Case
Eating breakfast	5:45 AM	05:45	- Retain - Omit AM	2
Taking a bath before going to school	6:00 AM	06:00	- Retain - Omit AM	2
Praying before sleeping at night	8:00 PM	20:00	- Add 12 hours to 8:00 - Omit PM	3
Playing toys with siblings/friends	6:15 PM	18:15	- Add 12 hours to 6:15 - Omit PM	3

time they usually do the given activities.

- After completing the 2nd column, the teacher will ask the learners to convert them into 24-hour format.

Please note that learners' answers may vary.

To process this activity, the teacher will ask these questions:
What time do you do the following activities?

Eating breakfast? **5:45 AM**

Taking a bath before going to school? **6:00 AM**

Praying before sleeping at night? **8:00 PM**

Playing toys with siblings/friends after school? **6:15 PM**

Doing homework after school? **5:00 PM**

Eating dinner? **6:45 PM**

The teacher may reiterate the following when converting 12 hour time and 24-hour time formats.

Case 1: First hour of the day

- Conversely, to convert from a 12-hour to a 24-hour format, subtract 12 hours and omit the AM.

Doing your homework after school	5:00 PM	17:00	- Add 12 hours to 5:00 - Omit PM	3
Eating dinner	6:45 PM	18:45	- Add 12 hours to 6:45 - Omit PM	3

Let us have another set of examples on conversion of 12-hour and 24-hour time formats.

12-Hour Time	24-Hour Time	How to convert?	Case
12:11 AM	-----	Subtract 12 hours from 12:11, therefore, 12:11 AM will be 00:11	1
-----	00:21	Add 12 hours to 00:21, therefore, 00:21 will be 12:21 AM (affix AM)	1
-----	11:07	- Retain the time - Affix AM to the time - Therefore, 11:07 will be 11:07 AM	2
12:15 PM	-----	- Retain the time - Omit PM to the time - Therefore, 12:15 PM will be 12:15	2
4:09 PM	-----	Add 12 hours to 4:09, therefore, 4:09 PM will be 16:09	3
-----	19:55	Subtract 12 hours from 19:55, therefore, 19:55 will be 7:55 PM (affix PM)	3

3) Lesson Activity

Activity 2

Refer to the Worksheets for the activity which the learners will accomplish.

SUB-TOPIC 3: SOLVE WORD PROBLEMS INVOLVING 12- AND 24-HOUR TIME

1) Explication

- To convert starting from the first hour of the day from a 24-hour to a 12-hour format, add 12 hours and affix the AM.

Case 2: From 1:00 AM to 12:59 PM

- From 1:00 AM to 12:59 PM, hours are the same in both 12-hour and 24-hour formats, except for the omission of AM/PM in the latter.

Case 3: From 1:00 PM to 11:59 PM

- From 1:00 PM to 11:59 PM, add 12 hours to convert to a 24-hour time format. Then, omit the PM.
- Conversely, from 13:00 to 23:59, subtract 12 hours to convert to a 12-hour time format. Then, affix the PM.

The teacher should not require learners to memorize/identify case types. The intention is just to let the learners easily recognize the case applied for each activity.

Let us analyze and solve the given word problem.

Rapha attended school on a Wednesday and went home after finishing his last class. He arrived at his house at 4:50 in the afternoon. Convert the given time into the 24-hour format.

To process the word problem, the teacher will ask the following questions:

- Who attended school on a Wednesday? Answer: Rapha
- What time did Rapha arrive at his house? Answer: 4:50 PM
- What is asked in the word problem?

Answer: Convert 4:50 PM into 24-hour time format

- How do we convert the given time into 24-hour format?

Answer: To convert 4:50 PM into a 24-hour format, we add 12 hours to 4:50 and omit the abbreviation PM. Therefore, **4:50 PM will become 16:50.**

2) Worked Examples

Let us move on to more examples.

Example 1:

Kenneth needs to catch a train scheduled for 05:30. What is the departure time in a 12-hour format?

Example 2:

Theon's job interview is set for 2:15 PM. What time is his interview in a 24-hour time format?

Example 3:

Kelvin's flight from Ninoy Aquino International Airport (NAIA) to Davao Airport will depart at 15:25 local time and arrive at 17:30. However, due to unexpected delays, the flight is 45 minutes late. What time will Kelvin depart from NAIA? What time will Kelvin reach Davao Airport? Express Kelvin's departure time and arrival time in 12-hour and 24-hour formats.

Solution:

	24-hour format	12-hour format
Departure:	Add 45 minutes to 15:25 Answer: 16:10	Subtract 12 hours from 16:10 Affix PM Answer: 4:10 PM
Arrival:	Add 45 minutes to 17:30 Answer: 18:15	Subtract 12 hours from 18:15 Affix PM Answer: 6:15 PM

Answers for **Activity 2:**

A.

1. 5:15 AM
2. 9:18 PM
3. 12:31 AM
4. 7:27 PM
5. 11:59 PM

B.

1. 18:10
2. 00:50
3. 04:35
4. 10:58
5. 15:37

Solution for Example 1:
Retain the given time and affix AM. Hence, *05:30 will become 5:30 AM.*

Solution for Example 2:
Add 12 hours to 2:15 and omit PM; Hence, 2:15 PM will become 14:15.

Recall the steps involved in converting from 12-hour time format to 24-hour time format and vice versa.

Answer Key for **Activity 3:**

1. 8:45 PM

	3) Lesson Activity Activity 3 Refer to the Worksheets for the activity which the learners will accomplish.	2. 09:05 3. Departure: 1:40 PM; 13:40 Arrival: 4:05 PM; 16:05																
B. Making Generalizations	1) Learners' Takeaways The teacher will guide the pupils in completing this table. <table><tr><td><i>Key Ideas/Concepts</i></td><td><i>What I've Learned from the Discussion</i></td><td><i>Concepts that are Somewhat Confusing</i></td><td><i>Concepts I Totally Don't Understand</i></td></tr><tr><td>Describing 12- and 24-hour time.</td><td></td><td></td><td></td></tr><tr><td>Converting 12- and 24-hour time, and vice versa.</td><td></td><td></td><td></td></tr><tr><td>Solving word problems involving 12- and 24-hour time</td><td></td><td></td><td></td></tr></table> 2) Reflection on Learning The learners will complete the given statements. <i>You respect other people's time when you _____.</i> <i>Time management is essential because _____.</i>	<i>Key Ideas/Concepts</i>	<i>What I've Learned from the Discussion</i>	<i>Concepts that are Somewhat Confusing</i>	<i>Concepts I Totally Don't Understand</i>	Describing 12- and 24-hour time.				Converting 12- and 24-hour time, and vice versa.				Solving word problems involving 12- and 24-hour time				
<i>Key Ideas/Concepts</i>	<i>What I've Learned from the Discussion</i>	<i>Concepts that are Somewhat Confusing</i>	<i>Concepts I Totally Don't Understand</i>															
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Converting 12- and 24-hour time, and vice versa.																		
Solving word problems involving 12- and 24-hour time																		

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		NOTES TO TEACHERS
A. Evaluating Learning	1. Formative Assessment Activity 4 Refer to the Worksheets for the activity which the learners will accomplish. A. 06:01 12:00 PM 12:00 AM 01:59 5:44 PM 22:15 15:40 2:20 AM 11:54 PM 00:30 B. 17:45 12:29 AM 10:05 2 hours and 15 minutes No	

B. Teacher's Remarks	<i>Note observations on any of the following areas:</i>	Effective Practices	Problems Encountered	The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different strategies, materials used, learner engagement and other related stuff. Teachers may also suggest ways to improve the different activities explored/lesson exemplar.
	strategies explored			
	materials used			
	learner engagement/ interaction			
	others			
C. Teacher's Reflection	<i>Reflection guide or prompt can be on:</i> ▪ <u>principles behind the teaching</u> <i>What principles and beliefs informed my lesson?</i> <i>Why did I teach the lesson the way I did?</i> ▪ <u>students</u> <i>What roles did my students play in my lesson?</i> <i>What did my students learn? How did they learn?</i> ▪ <u>ways forward</u> <i>What could I have done differently?</i> <i>What can I explore in the next lesson?</i>			Teachers's reflection in every lesson conducted/facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.