



MATATAG

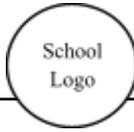
Bansang Makabata



Batang Makabansa



BAGONG PILIPINAS



School
Logo

Name of School:		Quarter:	4th Quarter
Grade Level & Section:	Grade 7	Week:	Week 7 Day 4
Subject:	TLE	Date and Time:	
Topic:		Teacher:	

I. CONTENT, STANDARDS AND LEARNING COMPETENCIES		ANNOTATIONS
A. CONTENT STANDARDS	The learners demonstrate an understanding of the concepts and principles in performing mensuration and calculations.	
B. PERFORMANCE STANDARDS	The learners perform mensuration and calculations following safety precautions	
C. LEARNING COMPETENCIES	Learning Competency Interpret the readings in different measuring instruments.	
D. LEARNING OBJECTIVES	Learning Objectives At the end of the lesson, the students are expected to: 1. Explain the function and uses of tachometer, oscilloscope, and ampere meter. 2. Identify the parts of the tachometer, oscilloscope, and ampere meter. 3. Interpret the readings of tachometer, oscilloscope, and ampere meter.	
I. CONTENT		
Scale Reading		

II. LEARNING RESOURCES

A. REFERENCES	
B. OTHER LEARNING RESOURCES	<p>Ammeters - A complete guide. (2023, March 7). Industrial Solutions & Electrical Components RS. https://ph.rs-online.com/web/content/discovery/ideas-and-advice/ammeters-guide</p> <p>How to measure current (Amperes) using analog multi-meter. (2021, June 28). YouTube. https://youtu.be/CcfQFqcMa7U?si=v31yCNTeM1giOB8j</p> <p>Huang, Y. (2022, June 21). How does a tachometer work? KUS Americas, Inc. KUS USA. https://kus-usa.com/resources/how-does-a-tachometer-work/</p> <p>Kulkarni, A. (2022, April 15). What is ammeter? Uses and benefits Complete guide on ammeter. BEEMET. https://beemet.com/ammeter-guide/</p> <p>Tachometer: Uses, types, measurement & working. (2021, November 29). Tesca Global Blog. https://www.tescaglobal.com/blog/digital-and-mechanical-tachometer/</p> <p>Tachometers - A complete guide. (2023, January 24). Industrial Solutions & Electrical Components RS. https://uk.rs-online.com/web/content/discovery/ideas-and-advice/tachometers-guide</p> <p>Understanding oscilloscope parts and function: A comprehensive guide - Keysight technologies. (n.d.). https://savings.em.keysight.com/en/knowledge/guides/used-oscilloscope-buying-guide/oscilloscope-parts-and-function</p> <p>What is an oscilloscope? (2021, May 11). Test and Measurement Equipment Tektronix. https://www.tek.com/en/blog/what-is-an-oscilloscope#EbUses</p>

III. TEACHING AND LEARNING PROCEDURE

BEFORE/PRE-LESSON PROPER

ACTIVATING PRIOR KNOWLEDGE	<p>Lesson Review</p> <p>The ampere meter (ammeter) is an essential electrical instrument used to measure electric current in a circuit. This</p>	
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lesson review will summarize its key concepts, usage, and importance.

Key Points to Remember

1. **Definition of an Ammeter**
 - An **ammeter** is a measuring device used to determine the amount of **electric current (amperes, A)** flowing through a circuit.
2. **Unit of Measurement**
 - Current is measured in **amperes (A)**, named after **André-Marie Ampère**, a physicist known for his work in electromagnetism.
3. **Connection in a Circuit**
 - An ammeter must be connected **in series** with the circuit to measure the total current flow accurately.
 - **Never connect an ammeter in parallel**, as it may cause a short circuit and damage the meter.
4. **Types of Ammeters**
 - **Analog Ammeter** – Uses a needle and dial to display current readings.
 - **Digital Ammeter** – Displays the current value numerically on a screen.
 - **Clamp Meter** – Measures current without direct contact by detecting the magnetic field around a conductor.
5. **Shunt Resistor Function**
 - Ammeters have a **shunt resistor** to **bypass excess current** and prevent damage.
6. **Internal Resistance**
 - The **internal resistance of an ammeter must be low** to avoid altering the circuit's current flow.
7. **Applications of an Ammeter**
 - Used in **electrical troubleshooting** and **circuit analysis**.
 - Important in **electrical safety** to detect excessive current that could lead to overheating or short circuits.

Review Questions

1. What is the main function of an ammeter?
2. In what unit is electric current measured?
3. How should an ammeter be connected in a circuit?
4. Why is it dangerous to connect an ammeter in parallel?
5. What are the three main types of ammeters?

Answers:

1. To measure electric current
2. Amperes (A)
3. In series
4. It may cause a short circuit and damage the meter

		5. Analog ammeter, digital ammeter, clamp meter
<p>LESSON PURPOSE/INTENTION</p>	<ol style="list-style-type: none"> 1. Understand the concept of scale reading and its importance in measurement. 2. Identify different types of measuring instruments that use scales, such as rulers, weighing scales, thermometers, and pressure gauges. 3. Read measurements accurately from analog and digital scales. 4. Apply correct reading techniques to avoid errors, such as parallax error in analog scales. 5. Use scale readings in real-life applications, such as in science experiments, engineering, and daily activities. <p>This lesson aims to enhance observation skills, accuracy, and critical thinking when working with measurement tools.   </p>	
<p>LESSON LANGUAGE PRACTICE</p>	<p>Vocabulary:</p> <ul style="list-style-type: none"> o Scale – A series of markings on a measuring instrument that represents units of measurement. o Graduations – The small divisions or lines on a scale that indicate measurement values. o Calibration – The process of adjusting and verifying a measuring instrument to ensure accuracy. o Parallax Error – A reading error that occurs when the observer's eye is not aligned directly with the scale. o Analog Scale – A type of scale with a pointer or needle that moves across a graduated scale. o Digital Scale – A scale that displays measurements numerically on a screen. o Least Count – The smallest value that can be measured accurately by a scale. o Zero Error – A type of measurement error that occurs when an instrument does not start from zero. o Range – The maximum and minimum values that a measuring instrument can record. 	

	<ul style="list-style-type: none"> o Unit of Measurement – The standard quantity used to express a measurement (e.g., grams, meters, liters). o Precision – The ability of a measuring instrument to give consistent readings. o Accuracy – How close a measurement is to the true or accepted value. o Tare Function – A feature on digital scales that resets the scale to zero after placing a container or object. o Weighing Scale – An instrument used to measure weight or mass. o Thermometer – A device that measures temperature using a graduated scale. o Pressure Gauge – A measuring instrument used to determine pressure levels in gases and liquids. o Meniscus – The curved surface of a liquid in a container, which should be read at eye level for accurate measurements. o Micrometer – A precision measuring tool used for very small measurements, often in engineering and machining. o Vernier Scale – A secondary scale used in measuring instruments (like calipers) to improve accuracy. o Reading Error – A mistake made when interpreting a scale, often due to poor alignment or misunderstanding of the graduations. 	
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DURING/LESSON PROPER

<p>READING THE KEY IDEA/STEM</p>	<p>What is Scale Reading?</p> <p>Scale reading is the process of interpreting measurements from instruments that use graduated markings or digital displays to show values. It is an essential skill in science, engineering, medicine, construction, and daily life to ensure accurate measurements.</p> <p>Why is Scale Reading Important?</p> <ol style="list-style-type: none"> 1. Ensures Accuracy – Proper scale reading helps avoid errors in measurements. 2. Supports Scientific and Industrial Applications – Used in labs, engineering, and medical fields. 	
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3. **Prevents Mistakes in Daily Life** – Used in measuring weight, height, temperature, and pressure.
4. **Enhances Problem-Solving Skills** – Helps interpret data effectively in different situations.

1. Analog Measuring Instruments

These instruments have **graduated scales with markings** and require manual reading. Examples include:

- **Rulers and Tape Measures** – Used to measure length and width in centimeters (cm) and inches (in).
- **Thermometers** – Measure temperature in degrees Celsius ($^{\circ}\text{C}$) or Fahrenheit ($^{\circ}\text{F}$).
- **Weighing Scales** – Used for measuring mass or weight in kilograms (kg) or grams (g).
- **Pressure Gauges** – Measure the pressure of gases and liquids in Pascals (Pa) or pounds per square inch (psi).
- **Speedometers** – Measure vehicle speed in kilometers per hour (km/h) or miles per hour (mph).

2. Digital Measuring Instruments

These provide **direct numerical readings** on a display, eliminating reading errors. Examples include:

- **Digital Weighing Scales** – Display weight in grams or kilograms instantly.
- **Digital Thermometers** – Give precise temperature readings with no manual interpretation needed.
- **Multimeters** – Measure voltage, current, and resistance electronically.

How to Read an Analog Scale Properly

1. Identify the Measurement Units

- Check the **unit of measurement** (e.g., cm, g, $^{\circ}\text{C}$) to understand the reading.

2. Determine the Scale's Least Count

- The **least count** is the **smallest value between two consecutive markings** on the scale.
- Example: If the markings on a ruler are divided into 1 mm increments, the least count is **1 mm**.

3. Read the Value at Eye Level

- For **liquids in a container**, read the **meniscus** (the curved surface) at eye level to avoid errors.

4. Avoid Parallax Error

- **Parallax error** happens when the observer's eye is **not directly aligned** with the scale.
- Always position the eye **perpendicular** to the measurement marking.

5. Estimate Values When Needed

- If the pointer or liquid falls **between two lines**, estimate the **nearest** value.

Common Errors in Scale Reading and How to Avoid Them

Error Type	Cause	How to Avoid It
Parallax Error	Viewing the scale from an angle	Always align the eyes directly with the scale
Zero Error	The instrument does not start at 0	Check for zero calibration before use
Misreading Graduations	Not understanding the scale intervals	Identify the least count before taking readings
Rounding Errors	Incorrectly estimating values	Round off correctly based on the closest marking

DEVELOPING and DEEPENING UNDERSTANDING OF THE KEY IDEA/STEM

Worked Example: Class demonstration

By peers, students will demonstrate the proper way of measuring amperes using multi meter.

Lesson Activity: Ammeter Reading

A.Directions: Determine the electric current reading on the ammeter below and indicate its unit of measurement.

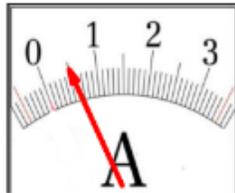
The teacher may use also the method of measuring current using clamp meter.

Answer key:

1. 2.0A
2. 0.5A
3. 1.5A
4. 3.0A
5. 1.6A



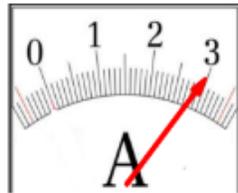
1. _____



2. _____



3. _____



4. _____



5. _____

B. Directions: Draw your own ammeter with the range of 0 to 1A, smallest division is 0.02A. Show five ammeter results, write the readings on the space provided.



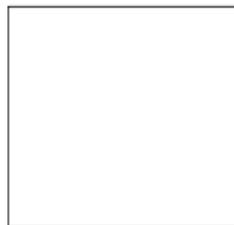
1. _____



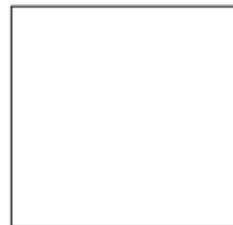
7. _____



8. _____



9. _____



10. _____

AFTER AFTER/POST-LESSON

**MAKING
GENERALIZATIONS
AND
ABSTRACTIONS**

1. Learners' Takeaways

- Can you summarize the four different scale reading device and state its functions? What is its importance in our daily lives?
- Consider that you are owning any type of business, for you, what is the implication of understanding this lesson?

2. Reflection on Learning

- Let the students make a reflection on what was discussed in this lesson by listing the remarkable information they've got.

**EVALUATING
LEARNING**

Directions:

Read each question carefully and choose the correct answer. Write the letter of your chosen answer.

1. What is the purpose of scale reading?

- A. To guess the measurement of an object
- B. To accurately determine the value shown on a measuring instrument
- C. To estimate values without using tools
- D. To compare objects without taking actual measurements

2. Which of the following instruments is NOT used for scale reading?

- A. Ruler
- B. Digital thermometer
- C. Clock
- D. Compass

3. What is the smallest measurement division on a measuring instrument called?

- A. Parallax
- B. Zero error
- C. Least count
- D. Graduation

4. Where should you position your eyes to avoid parallax error when reading a scale?

- A. Above the scale at an angle
- B. Below the scale at an angle
- C. Directly in line with the measurement marking
- D. At any position, as it does not affect accuracy

ANSWER

- 1.B
- 2.D
- 3.C
- 4.C
- 5.B

	<p>5. A thermometer scale shows the liquid level between 37°C and 38°C, with five small divisions between them. If the liquid level is at the third small division, what is the reading?</p> <p>A. 37.2°C B. 37.3°C C. 37.5°C D. 37.6°C</p>	
ADDITIONAL ACTIVITIES FOR APPLICATION OR REMEDIATION (IF APPLICABLE)		
REMARKS		
REFLECTION		

Prepared by:

*Subject Teacher
Teacher*

Reviewed by:

Master Teacher/Head