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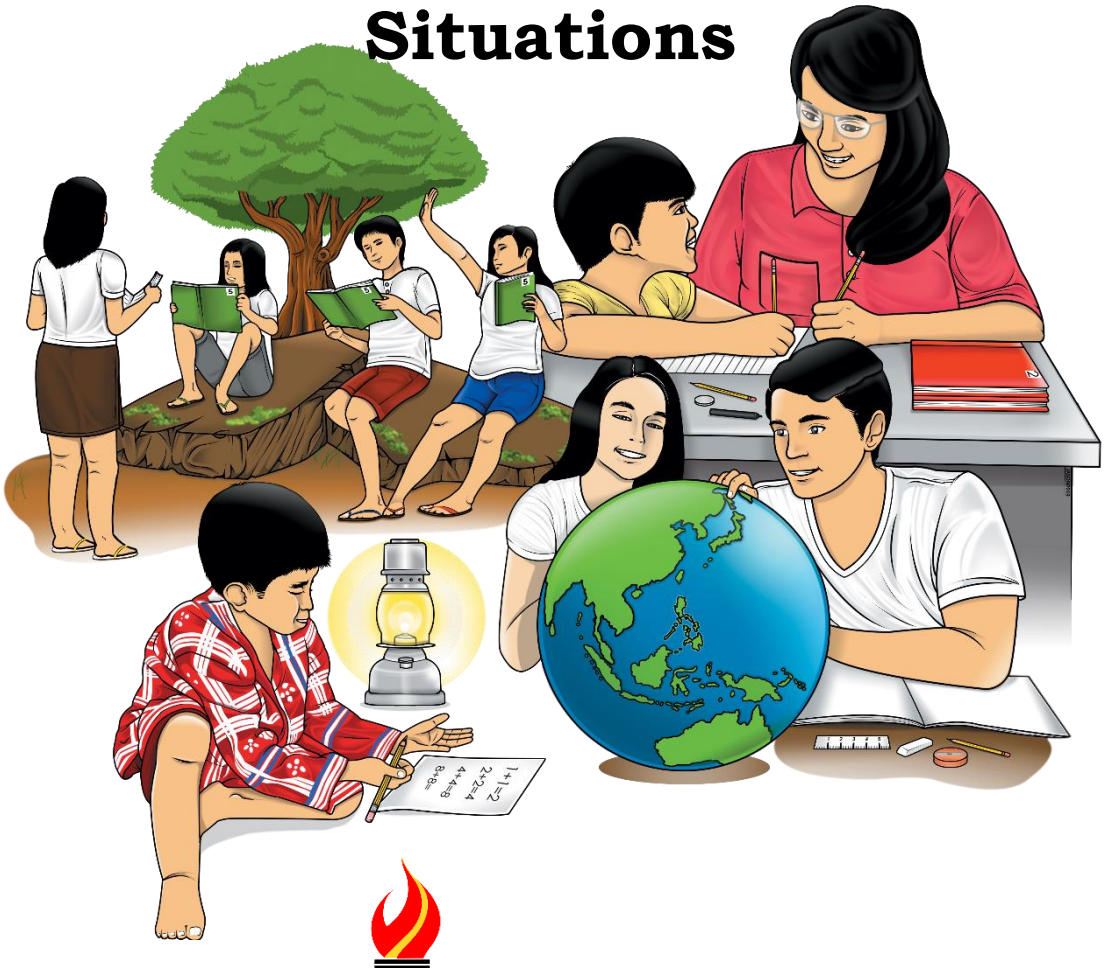
Mathematics

Quarter 4 – Module 10: Solving Routine and Non-Routine Problems Involving Temperature in Real-Life Situations



ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 5
Alternative Delivery Mode
Quarter 4 – Module 10: Solves routine and non-routine problems involving temperature in real life situations.
First Edition, 2020

Published by the Department of Education
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Undersecretary: Diosdado M. San Antonio

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Printed in the Philippines by _____

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Quarter 4 – Module 10: Solving Routine and Non-Routine Problems Involving Temperature in Real-Life Situations.

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

Good day, Mathlete!

This module was designed and written to help you gain an understanding of the concepts and skills needed to solve routine and non-routine problems involving temperature in real-life situations.

Have fun and enjoy because you will learn a lot in this module.

At the end of this module, you are expected to be able to:

- solve routine and non-routine problems involving temperature in real life situations.
- appreciate the importance of solving routine and non-routine problems involving temperature in our daily lives.

What I Know

Directions: Read each statement carefully. Choose the letter that corresponds to the best answer. Write your answers on a separate sheet of paper.

1. At 5:00 AM, the outside temperature was 24.9°C. By 10:30 AM, it was 33.2°C. Was there a change in the outside temperature? If so, what was the change?

   a. No, it was just the same. c. Yes, it went down by -8.3 C°.
   b. Yes, it went up by 8.3 C°. d. Yes, there was a 9.7 C° change

2. Chariz's temperature this morning was 38.5°C. After an hour, her temperature was down to 37.4°C. Which is/are TRUE about her condition?

   a. Her condition worsened. c. Her temperature went down by 1.1 C°.
   b. Her condition improved. d. Both B and C.

3. The temperature of a hot cup of coffee was 97°C. After some time, it had gone down by 11 C°. What is its temperature now?

   a. 83°C c. 85°C
   b. 84°C d. 86°C

4. The TV news weather report forecast the lowest temperature for the day to be 22°C and the highest, 35°C. What is the difference between the lowest and highest temperature forecasts for the day?

   a. 13°C c. 15°C
   b. 14°C d. 13.5°C

5. At 8:00 AM, the temperature in the room was 25.6°C. By noon, it had gone up by 2.5 C°. But by 6:00 PM, it had gone down by 3.3 C°. What was the temperature in the room at 6:00 PM?

   a. 28°C c. 28.4°C
   b. 24.8°C d. 28.5°C

6. At 1:00 PM, the temperature was 31.9°C. By 5:30 PM, it was 20.6°C. By how many degrees did the temperature drop? Which of the following problem-solving strategies can be used to solve the problem?

    a. make a drawing or a diagram
    b. work backwards
    c. write a number sentence
    d. all of the above

7. Mark's temperature this morning was 38.2°C. After 2 hours, it was 39.5°C. All are true about Mark's condition EXCEPT

    a. His condition worsened.
    b. His condition improved.
    c. His temperature went up by 1.3 C°
    d. He has high fever.

8. What would be a person's temperature if it is 3.8 C° higher than normal?

    a. 40.3°C
    b. 40.8°C
    c. 33.2°C
    d. 34.8°C

9. Ten minutes after it had stopped boiling, the water in the pot had cooled down by 8C°. After 30 minutes, its temperature had dropped by another 16C°. What is the temperature of the water in the pot now?

    a. 92°C
    b. 76°C
    c. 84°C
    d. 24°C

10. Rowan Jennika set her aircon at 28.6°C. At 11:30 AM, she lowered the setting by 3.5 C°. After an hour, she set it at 19°C. By how many degrees did she lower down the setting of the aircon at 12:30?

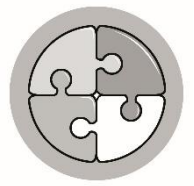
    a. 6.1°C
    b. 9.6°C
    c. 25.1°C
    d. 32.1°C

Lesson 1 Solves Routine and Non-Routine Problems Involving Temperature in Real Life Situations

Nice to see you again, Mathletes!

I hope you learned a lot in our lesson on reading and measuring temperature. In this module, you will learn how to apply the skills you learned in our previous lesson. Sometimes, there are life situations that involve temperature. This lesson will help you understand and learn how to solve routine and non-routine word problems involving temperature.

Are you excited to learn new things about our topic? Then read and study this module for you to understand our lesson.



What's In

In the previous lesson, you learned the concept of temperature and the different types of thermometers. You also learned how to read and measure temperature in degree Celsius. In this module, you will learn how to solve routine and non-routine problems involving temperature in real-life situations.

Before we go to our lesson let us have a quick review.

Which is the better estimate of the temperature of each item?

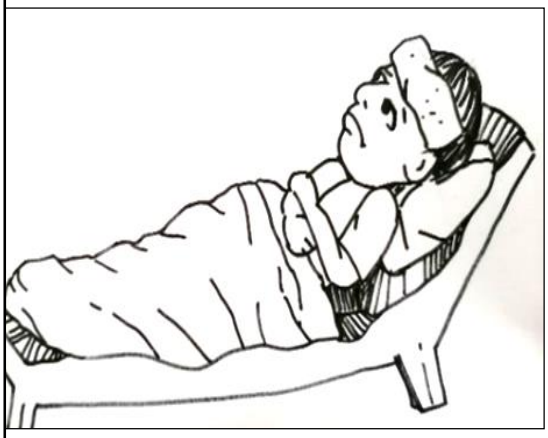
1.	high fever	a. 40°C	b. –10°C
2.	cold soft drinks	a. 10°C	b. 30°C
3.	air-conditioned room	a. 35°C	b. 19°C
4.	fruit shake	a. 5°C	b. 75°C
5.	sunny day	a. 15°C	b. 33° C

What's New

There are times when we find it difficult to solve real-life problems involving temperature. Some of these problems do not actually need the use of a formula to solve. All we have to do is be creative and devise some strategy

Read and study the story below.

Arjan was nursing a fever. By ten o'clock in the morning, his temperature had gone up by 1.5°C from his temperature at 7 AM. By 3:00 o'clock in the afternoon, though, his temperature had gone down by 1.2 C°. But at 10 PM, his temperature was again up by 1.1 C°. If his temperature at 10 PM was 39.5°C, what was his temperature at 7 AM?



Have you experienced answering a word problem involving a situation like this? Do you know how to solve this type of a problem? What strategies can you use to come up with the correct answer?

There are different problem-solving strategies that can help you solve word problems. Always remember that not all problems require a particular formula or strategy to solve. Sometimes, you may just need to act it out or make a sketch or a drawing or some other technique.

This module will present some strategies that may help you solve routine and non-routine word problems involving temperature in real-life situations.

What Is It

In solving problems involving temperatures in real-life situations, study the four-step plan to solve routine and non-routine word problems below.

The Four- Step Plan in Solving Word Problems

1. Understand the problem.
    a. Identify the question.
    b. Identify the relevant facts.

2. Plan what to do.
    a. Choose a strategy to help you solve the problem. There are different strategies for different problems. It is up to you which strategy you think may best help you solve the word problem much more easily. Below is a list of problem-solving strategies that you may use.
        - Draw a picture or a diagram.
        - Make a table or list.
        - Guess and check.
        - Write a number sentence.
        - Break problem into smaller parts.
        - Solve a simpler problem.
        - Look for a pattern.
        - Act it out.
        - Make a model.
        - Work backwards.
        - Use logical reasoning.

3. Solve for the answer / Carry out the Plan.
    a. Perform the strategy.

4. Check / Look back
    a. Verify if the answer is correct.

Let us go back to the problem. Let us try to solve this one with the use of the four-step plan in solving problems.

Arjan was nursing a fever. By ten o'clock in the morning, his temperature had gone up by 1.5°C from his temperature at 7 AM. By 3:00 o'clock in the afternoon, though, his temperature had gone down by 1.2 C°. But at 10 PM, his temperature was again up by 1.1 C°. If his temperature at 10 PM was 39.5°C, what was his temperature at 7 AM?

STEP 1 **Understand the problem**

Identify the question ➡ What was Arjan's temperature at 7 AM

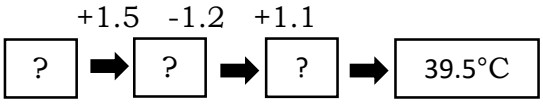
Identify the relevant facts ➡ Arjan was nursing a-fever.
By ten o'clock in the morning, his temperature had gone up by 1.5°C from his temperature earlier at 7 AM.
By 3:00 o'clock PM, his temperature had gone down by 1.2 C°.
At 10 PM, his temperature was again up by 1.1 C°.

STEP 2 **Plan what to do**

Choose a strategy. ➡ Drawing a diagram or Workingbackwards

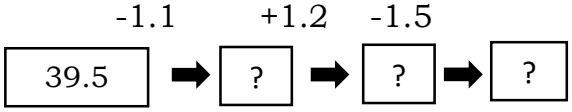
STEP 3 **Solve for the answer**

Perform the strategies (by using a diagram) ➡ Illustrate the problem by using a diagram



7 AM 10 AM 3 PM 10 PM

STEP 4 (by working backwards) ➡ Work backwards. Start with the last fact. Remember that addition and subtraction are inverse operations.



10 PM 3 PM 10 AM 7 AM

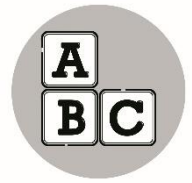
At 3 PM: 39.5°C – 1.1 = 38.4°C
At 10 AM: 38.4°C + 1.2 = 39.6°C
At 7 AM: 39.6°C – 1.5 = 38.1°C

Answer : Arjan's body temperature at 7 AM was 38.1°C

Check your answer
Verify if the answer is correct.

Substitute the values for each of the boxes in the first diagram above and perform the indicated operations.
38.1°C + 1.5 = 39.6°C
39.6°C - 1.2 = 38.4°C
38.4°C + 1.1 = 39.5°C

Therefore, the answer is correct.



What's More

Activity 1 Problem Solving

Read each problem carefully and follow the steps in solving problem.

1. The lowest temperature in the Philippines that was officially recorded by PAGASA was 6.3°C. It was recorded in Baguio on January 18, 1961.The highest was 42.2 degrees Celsius in Tuguegarao, Cagayan on May 11, 1969. What is the difference between these two temperatures?

2. A freezer was set at 0°C. Sophia reset it to 8.5°C.Would the temperature in the freezer likely rise or drop? By how many degrees?

Activity 2 Solve it, wisely!

Solve the problems below using any strategy

1. A group of tourists noticed that the temperature in Tarangban Falls in Calbayog City was 6.5°C lower than the temperature in the city proper. What was the temperature in Tarangban Falls if the temperature in the city proper was 32.3°C?

2. An air conditioner was set at 24°C in the morning. It was reset to 19°C at 12 noon. Would the temperature likely rise or drop after that? By how many degrees?

3. The recorded temperatures for 5 days in Calbayog City, Samar were 33°C, 31°C, 32°C, 32°C and 35°C. What is was the average temperature in Calbayog City for the 5 days?

Activity 3 Strategize and Solve!

Cesca measured the temperatures of three different liquids in her Science class. The temperature of the soft drink was 7°C. The temperature of the vinegar was 8 C° higher than the temperature of the soft drink. If the temperature of the ice water was 15 C° lower than the temperature of the vinegar, what was the temperature of the ice water?

What I Have Learned

A. Fill in the blanks.
Below are the steps in solving problems involving temperature.
Fill in the blanks with the correct word or phrases to make the statements complete.

In order to solve routine and ___(1)___ word problems involving (2)_____ in real life situations, we follow the ___(3)____.

The steps in the four-step plan are __(4)____, ___(5)_____, _____(6) , and _____(7)_____.

B. Enumeration.

What are some of the different problem solving strategies that we can use in solving routine and non-routine problems involving temperature in real life situations? Give at Least 5.

1._____
2._____
3._____
4._____
5._____

What I Can Do

Use the facts in the table below to answer the questions that follow.

Element	**Melting Point** °C
Gold (Au)	1 064.43
Lead (Pb)	327.50
Sodium (Na)	97.72
Aluminum (Al)	660.37
Helium (O)	-272.20
Tungsten (W)	3,414°C

1. How much-higher is the temperature needed to melt gold than the temperature needed to melt lead?

2. How much lower is the temperature needed to melt sodium than the temperature needed to melt aluminum?

3. How much higher is the melting point of tungsten compared to the boiling point of water?

4. Which among the elements in the list above has the lowest melting point? What is its melting point?

5. Which among the elements in the list above has the highest melting point? At what temperature will it melt?

Assessment

A. Directions: Read and understand the questions that follow. Choose the letter that corresponds to the correct answer. Write your answer on a separate sheet of paper.

1. Mr. Castillo measured the temperature in the classroom at 12:00 noon. It was 34.8°C. By 5:30 pm, it was 28.6°C. The following problem-solving strategies can be used to solve the problem EXCEPT

   a. Make a drawing or a diagram
   b. Work backwards
   c. Write a number sentence
   d. Compose a song

2. One morning, the outside temperature was 24.9°C. By noon, it had gone up by 1.3°C. But by 5 PM, it had gone down by 1.4°C. What was the temperature at 5 PM??

   a. 27.6°C
   b. 25°C
   c. 28.4°C
   d. 24.8°C

3. Luisa's temperature this morning was 39.5°C. After an hour, her temperature was 37.5°C. Which statement best describes her condition?

   a. Her condition worsened
   b. Her condition improved
   c. Her temperature went down by 2°C
   d. Her temperature went up by 2°C

4. The temperature of freshly baked hot malungay pandesal is 68°C; while hot coffee is 85°C. What is the difference between the two temperatures?

   a. 15°C
   b. 17°C
   c.
   c. 23°C
   d. 2.3°C

5. The forecast for today's lowest temperature is 25°C and the highest temperature is 36.5°C. What is difference between the highest and lowest temperature forecasts for the day?

   a. 13°C
   b. 11°C
   c. 15°C
   d. 11.5°C

6. At 9 AM, the temperature in a room was 25.6°C. At 11:30 AM, it was up by 1.3°C. If the temperature at 12:30 PM was 27.4°C, what was the change in the temperature in the room from 11:30 AM to 12:30 PM?

   a. 0.8°C
   b. -0.5°C
   c. 0.5°C
   d. 1.8°C

7. Fiona's temperature at 10 AM this morning was 38.2°C. An hour later, her temperature had gone down by 1.2 C°. Which of the following statements is TRUE about Fiona's condition at 11 AM?

    a. Fiona's condition worsened.
    b. Fiona's condition was normal.
    c. Her temperature went down because she took her medicines.
    d. She still has high fever.

8. The reading rose by 1.2 C°. What is the present reading?

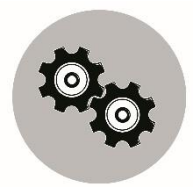
    a. 37°C
    b. 39.2°C
    c. 39.4°C
    d. 40°C

9. The newspaper weather report says the lowest temperature for the day will be 9°C and the highest temperature, 28°C. If the temperature at 10:00 AM was midway between the forecast coldest and hottest temperatures for the day, what was the temperature at 10:00 AM?

    a. 19°C
    b. 18.5°C
    c. 19.5°C
    d. 18°C

10. The temperature yesterday in Seoul, the capital of South Korea, was 2 C° below freezing point of water. What was the temperature in Toronto, Canada yesterday if it was 2 C° lower than it was in Seoul?

    a. -2°C
    b. 2°C
    c. -4°C
    d. 4°C



Additional Activities

Hooray! You made it! Finally, you're in the last activity. If you answer the questions correctly, you are set to go to next lesson.

Solve the following problems. Follow the steps in solving word problems.

1. Princess Luz's temperature is 2.5 C° above normal. What is her temperature?

2. One sunny afternoon, the temperature was 32°C. It then went up to 33.5°C.After a few hours, it was down by 3 times the temperature difference between the first and second readings. What was the third temperature reading?

Answer Key

What I Know

1. B
2. D
3. D
4. A
5. B
6. D
7. B
8. B
9. B
10. A

What's In

1. A
2. A
3. B
3. B.
4. A
5. B

What's More

Activity 1:

1. Square35.9 ° C
2. the temperature would likely rise, by 8.5 °C

Activity 2:

1. 25.8 ° C
2. the temperature would likely dropped, by 5 °C
3. 32.6 °C

Activity 3:

Ice Water (I)	Soft drink (S)	Vinegar (V)
S - 15	**7**	S + 8
S – 15	7	**15**
0	7	15

The temperature of the ice water was 0°C

What I Have Learned

A. Fill in the blanks
1. non-routine
2. temperature
3. four- step plan
4. Understand the problem
5. Plan what to do
6. Solve for the answer
7. Check your answer

B.

Enumeration (possible answers)
Draw a picture or a diagram.
Guess and check.
Break problem into smaller parts.
Look for a pattern.
Make a model.
Use a logical reasoning.
Make a table or list.
Write a number sentence.
Solve a simpler

What I Can Do

1. 736.93
2. 562.65
3. 3 314
4. Helium,-272.2
5. Tungsten; 3,414°C

Assessment

1. D
2. D
3. B
4. B
5. D
6. C
7. B
8. C
9. B
10. C

Additional Activities

1. Princess Luz's temperature: 39.5 °C
2. 29°C

References

Lumbre, Angelina P., and Alvin C. Ursua. 2016. *21St Century Mathematics 5 Textbook*. Quezon City: Vibal Group, Inc.

Bamba, Nelia D., and Carmelita C. Coronel.2010. *MATHEMATICS for a Better Life 5 Textbook*. Quezon City: SD Publications, Inc.

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