Time and Temperature

Time and Temperature

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. B) 7,200 seconds
Explanation: 1 hour = 3,600 seconds, so 2 hours = 2 × 3,600 = 7,200 seconds.

2. B) 1.5 hours
Explanation: 90 minutes = 90 ÷ 60 = 1.5 hours.

3. B) 2 hours 30 minutes
Explanation: From 8:00 PM to 10:30 PM is 2 hours and 30 minutes.

4. B) 75 minutes
Explanation: 4,500 seconds ÷ 60 = 75 minutes.

5. B) 2 hours 30 minutes
Explanation: From 3:15 PM to 5:45 PM is 2 hours and 30 minutes.

ADVANCED LEVEL

More than One Answer Type

6. A) Calculating the time left until an event starts, B) Finding out how much time has passed since a meeting began, C) Determining how long a task took by subtracting start time from end time
Explanation: All of these involve subtracting time (either from a specific event or between start and end times).

7. A) Identify the start and end times, C) Subtract the start time from the end time
Explanation: To calculate elapsed time, first identify the start and end times, then subtract the start time from the end time.

8. A) A concert starts at 7:00 PM and ends at 9:00 PM, B) A bus arrives at 8:15 AM after leaving at 7:45 AM, D) A meeting lasts from 1:00 PM to 2:30 PM
Explanation: These are valid examples of calculating elapsed time (start and end times). A movie running for 90 minutes is a set duration, not elapsed time.

Fill In the Blanks

9. 105 minutes
Explanation: 1 hour = 60 minutes, so 1 hour 45 minutes = 105 minutes. Adding the 30-minute break gives 135 minutes.

10. 205 minutes
Explanation: 3 hours = 180 minutes, so 3 hours and 25 minutes = 180 + 25 = 205 minutes.

Matching Type
11. Match the Time Operations to Their Descriptions
1. Adding Time ------- B. Calculating the total duration by combining hours and minutes
2. Subtracting Time ------- D. Determining the difference between two times, ensuring to borrow if needed
3. Time Elapsed -------- A. Finding the duration between a start and end time
4. Converting Time -------- C. Changing time from one unit to another, like minutes to seconds
Explanation: Each operation matches its appropriate description based on how time is handled.

Answer the Following Questions
12. 8:30 AM
Explanation: Alex arrives at 7:30 AM, works out for 45 minutes (7:30 + 0:45 = 8:15 AM), and then stretches for 15 more minutes (8:15 + 0:15 = 8:30 AM).

13. 50 minutes
Explanation: From 4:10 PM to 5:00 PM is 50 minutes.

14. 2 hours 15 minutes
Explanation: From 8:00 PM to 10:15 PM is 2 hours and 15 minutes.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions
1. B) 4:15 PM
Explanation: Starting at 2:30 PM, add 1 hour 45 minutes. 2:30 + 1 hour = 3:30 PM, then add 45 minutes to 3:30 = 4:15 PM.

2. B) 4 hours 5 minutes
Explanation: Add the hours and minutes separately: 2 hours + 1 hour = 3 hours, and 20 minutes + 45 minutes = 65 minutes. 65 minutes = 1 hour 5 minutes, so 3 hours + 1 hour 5 minutes = 4 hours 5 minutes.

3. B) 10,080 minutes
Explanation: 1 week = 7 days, and 1 day = 24 hours. 7 days × 24 hours = 168 hours, and 168 hours × 60 minutes = 10,080 minutes.

4. B) 10,800 seconds

Explanation: 2 hours = 7,200 seconds (2 × 60 × 60) and 30 minutes = 1,800 seconds (30 × 60). 7,200 + 1,800 = 10,800 seconds.

5. A) 7:45 PM
Explanation: Starting at 6:30 PM, add 1 hour 15 minutes. 6:30 + 1 hour = 7:30 PM, then add 15 minutes to 7:30 = 7:45 PM.

ADVANCED LEVEL

More than One Answer Type

6. A) Seconds (s), C) Minutes (min), D) Hours (h)
Explanation: Seconds, minutes, and hours are common units of time. Gallons are a unit of capacity, not time.

7. A) 1 hour = 60 minutes, C) 1 day = 24 hours, D) 1 week = 7 days
Explanation: These are correct time conversions. 1 hour = 60 minutes, 1 day = 24 hours, and 1 week = 7 days.

8. B) If minutes exceed 60, convert to hours.
Explanation: When adding time, if minutes exceed 60, they should be converted into hours. The other statements are not universally true.

Fill In the Blanks

9. 2 hours and 15 minutes
Explanation: From 1:30 PM to 3:45 PM is 2 hours and 15 minutes.

10. 7:30 PM
Explanation: Starting at 5:20 PM, adding 2 hours 10 minutes brings the time to 7:30 PM.

Matching Type

11. Match the Time Units to Their Equivalent Values
1. 1 Hour ------- D. 60 Minutes
2. 1 Day -------- A. 24 Hours
3. 1 Week -------- B. 7 Days
4. 1 Minute ------- C. 60 Seconds
Explanation: These are the equivalent values for each unit of time.

Answer the Following Questions

12. 46 hours
Explanation: From Friday at 5:00 PM to Sunday at 3:00 PM is 2 full days (48 hours), minus 2 hours (from 3:00 PM to 5:00 PM on Friday). So, 48 - 2 = 46 hours.

13. 2 hours 30 minutes
Explanation: From 4:15 PM to 6:45 PM is 2 hours and 30 minutes.

14. 7:20 PM
Explanation: Starting at 6:00 PM, add 1 hour 20 minutes to get 7:20 PM.

Finding Starting Time and Finishing Time

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. B) 10 days
Explanation: The project starts on January 10 and ends on January 20, so it lasts for 10 days, counting both the start and end dates.

2. B) 1:45 PM
Explanation: Starting at 9:00 AM, adding 4 hours brings it to 1:00 PM, then adding the remaining 45 minutes brings it to 1:45 PM.

3. B) 31 days
Explanation: March has 31 days, so the total number of days from March 1 to April 1 is 31 days.

4. B) 9:20 PM
Explanation: Starting at 7:00 PM, adding 2 hours brings it to 9:00 PM, then adding 10 more minutes brings it to 9:10 PM.

5. B) 2 hours
Explanation: From 1:00 PM to 3:30 PM is a duration of 2 hours and 30 minutes, not 2 hours.

ADVANCED LEVEL

More than One Answer Type

6. A) Leap years occur every four years, C) Leap years add an extra day to February (February 29).
Explanation: Leap years happen every 4 years and add an extra day to February, making it 29 days instead of the usual 28. Not all years are leap years.

7. A) 1 year = 365 days, C) 1 leap year = 366 days.
Explanation: A common year has 365 days, and a leap year has 366 days due to the extra day in February.

8. A) Manual counting of each day, B) Using a calendar or date calculator.
Explanation: Both methods are commonly used to calculate the number of days between two dates. A calendar or date calculator is often faster and more efficient.

Fill In the Blanks

9. 9:45 AM

Explanation: Starting at 8:30 AM and adding 1 hour 15 minutes brings it to 9:45 AM.

10. 7th September
Explanation: The seminar lasts for 2 days, starting on September 5, so it will end on September 7.

Matching Type
11. Match the Time Calculation Methods to Their Examples
1. Finding Starting Time ------- A. A concert finishes at 9:30 PM, lasting 2 hours; what time does it start?
2. Finding Finishing Time ------- C. A training session starts at 10:15 AM and lasts for 3 hours; what time does it finish?
3. Counting Days Manually -------- B. Calculate the total days from January 1 to January 31 by counting each day.
4. Using a Formula to Calculate Days ------- D. Calculate days between March 1 and March 15 using the formula for counting days.
Explanation: The methods match the examples based on how each time calculation is approached.

Answer the Following Questions
12. 15 days
Explanation: Starting from October 1, the project is due on October 15, so you have 15 days to complete it.

13. 3:45
Explanation: Starting at 1:15 PM and adding 2 hours 30 minutes brings the session to 3:45 PM.

14. 11 days
Explanation: The vacation lasts from June 10 to June 20, so the total duration is 11 days.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions
1. B) 6:30 PM
Explanation: Starting at 4:00 PM, adding 2 hours brings it to 6:00 PM, then adding 30 minutes brings it to 6:30 PM.

2. A) 3:30 PM
Explanation: Subtracting 1 hour 45 minutes from 5:15 PM brings the start time to 3:30 PM.

3. B) 15 days

Explanation: From April 10 to April 25, the total is 15 days.

4. A) 10:45 AM
Explanation: Starting at 8:30 AM and adding 2 hours brings it to 10:30 AM, then adding 15 minutes brings it to 10:45 AM.

5. B) 31 days
Explanation: December has 31 days.

ADVANCED LEVEL

More than One Answer Type
6. C) Subtract the duration from the finishing time
Explanation: To find the starting time, subtract the duration from the finishing time.

7. C) Add the duration to the starting time
Explanation: To find the finishing time, add the duration to the starting time.

8. A) Counting days from March 1 to March 15, C) Calculating the days between January 5 and February 10
Explanation: These examples involve calculating the number of days between two dates. A class duration and movie duration do not involve calculating days between dates.

Fill In the Blanks
9. 1:45 PM
Explanation: Starting at 11:00 AM, adding 2 hours 45 minutes brings it to 1:45 PM.

10. 1:30 PM
Explanation: Subtracting 3 hours from 4:30 PM gives the starting time as 1:30 PM.

Matching Type
11. Match the Time-Related Terms to Their Definitions
1. Starting Time ------ B. The time when an event begins.
2. Finishing Time ------- D. The time when an event ends.
3. Duration ------- A. The amount of time an event lasts, expressed in hours and minutes.
4. Time Elapsed ------- C. The total time that has passed between two specific times.

Answer the Following Questions
12. 2:30 PM
Explanation: Subtracting 2 hours from 4:30 PM gives the class start time as 2:30 PM.

13. 7:00 PM
Explanation: Starting at 6:15 PM and adding 1 hour 45 minutes brings it to 7:00 PM.

14. 2:00 PM
Explanation: Starting at 8:00 AM and adding 6 hours brings the school day to 2:00

PM.

Measurement of Temperature

TEACHING TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions

1. B) -273.15°C
Explanation: Absolute zero, the lowest possible temperature, is -273.15°C.

2. B) 180°C
Explanation: To convert 350°F to Celsius, use the formula: $C=(F-32)\times 5/9$
350°F=180°C.

3. A) 298.15 K
Explanation: To convert 25°C to Kelvin, use the formula: $K=C+273.15$
25°C=298.15K.

4. A) 86°F
Explanation: To convert 30°C to Fahrenheit, use the formula: $F=(C\times 9/5)+32$
30°C=86°F.

5. A) 100.4°F
Explanation: To convert 38°C to Fahrenheit, use the formula: $F=(C\times 9/5)+32$
38°C=100.4°F.

ADVANCED LEVEL

More than One Answer Type

6. A) Degrees Celsius (°C), B) Degrees Fahrenheit (°F), D) Kelvin (K)
Explanation: Celsius, Fahrenheit, and Kelvin are the common units used to measure temperature.

7. A) Liquid-in-glass thermometers contain mercury or colored alcohol.
C) Infrared thermometers measure thermal radiation from a distance
Explanation: Liquid-in-glass thermometers often use mercury or colored alcohol, and infrared thermometers measure temperature from a distance without contact. Digital thermometers do not provide a manual readout, and not all thermometers measure in Celsius only.

8. A) 25°C is equivalent to 77°F.
B) 0°C is the freezing point of water in Celsius.
D) 100°C is the boiling point of water in Celsius.
Explanation: 25°C is 77°F, 0°C is the freezing point, and 100°C is the boiling point.

To convert Celsius to Kelvin, you add 273.15, not subtract.

Fill In the Blanks
9. 350°F
Explanation: For optimal baking, many recipes instruct you to preheat the oven to 350°F.

10. Surface
Explanation: Infrared thermometers measure the temperature of an object's surface without making contact.

Matching Type
11. Match the Temperature Conversion Formulas to Their Examples
1. Celsius to Fahrenheit ------ C. $F = (C \times 9/5) + 32$
2. Fahrenheit to Celsius ------ D. $C = (F - 32) \times 5/9$
3. Celsius to Kelvin ------ B. $K = C + 273.15$
4. Kelvin to Celsius ------ A. $C = K - 273.15$

Answer the Following Questions
12. 392°F
Explanation: To convert 200°C to Fahrenheit: $F=(200\times 9/5)+32=392°F$.

13. 29.44°C
Explanation: To convert 85°F to Celsius: $C=(85-32)\times 5/9 =29.44°C$.

14. 310.15 K
Explanation: To convert 98.6°F to Kelvin, first convert to Celsius: $C=(98.6-32)\times 5/9 =37°C$,
then convert to Kelvin: $K=37+273.15=310.15K$.

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

Multiple Choice Questions
1. A) 0°C
Explanation: The freezing point of water is 0°C in the Celsius scale.

2. A) 20°C
Explanation: To convert 68°F to Celsius, use the formula: $C=(F-32)\times 5/9$ 68°F=20°C.

3. A) 98.6°F
Explanation: The typical body temperature is 98.6°F (or 37°C).

4. C) 373.15 K

Explanation: The boiling point of water is 100°C, which is equivalent to 373.15 K.

5. A) 212°F
Explanation: To convert 100°C to Fahrenheit, use the formula: $F=(C\times 5/9)+32$
100°C=212°F.

ADVANCED LEVEL

More than One Answer Type

6. A) Water freezes at 0°C and 32°F.
B) Water boils at 100°C and 212°F.
C) Water freezes at 273.15 K.
D) Water boils at 373 K.
Explanation: These are the standard freezing and boiling points of water in Celsius, Fahrenheit, and Kelvin.

7. A) Checking the weather to decide on clothing.
B) Setting an oven temperature for baking.
C) Measuring the temperature of a pool before swimming.
Explanation: These are common real-world uses of temperature measurements. Measuring the length of a room is not related to temperature.

8. A) The Kelvin scale starts at absolute zero (0 K).
C) Kelvin is primarily used in scientific contexts.
D) The Kelvin scale does not use negative values.
Explanation: The Kelvin scale starts at 0 K (absolute zero), is used in scientific contexts, and does not have negative values. Water freezes at 273.15 K, not at 0 K.

Fill In the Blanks

9. 0°C and 32°F
Explanation: Water freezes at 0°C and 32°F.

10. 98.6°F
Explanation: A normal body temperature is 98.6°F, which is typically within the normal range for a healthy adult.

Matching Type

11. Match the Temperature Units to Their Characteristics
1. Degrees Celsius (°C) ----- B. Commonly used in most countries; water freezes at 0°C and boils at 100°C.
2. Degrees Fahrenheit (°F) ----- C. Mainly used in the United States; water freezes at 32°F and boils at 212°F.
3. Kelvin (K) ----- A. Used primarily in scientific contexts and starts at absolute zero.

Answer the Following Questions

12. 32°F
Explanation: The freezing point of water is 0°C, which is equivalent to 32°F in the Fahrenheit scale.

13. -23.15°C
Explanation: To convert 250 K to Celsius: C=K-273.15
250K=-23.15°C.

14. 86°F
Explanation: To convert 30°C to Fahrenheit: F=(C× 9/5)+32
30°C=86°F.