



MATH for SCIENCE

Temperature Conversions ~ Lesson Plan

- I. Topic: Temperature Conversion ~
- II. Goals/Objectives:
- A. Students will be able to identify the three types of measurements for temperature.
 - B. Students will learn the conversion equations and steps to change temperatures from one set of temperature units to another set of temperature units.
 - C. Students will know water's boiling and freezing temperatures in all three temperature formats.
- III. National Education Standards:
- A. Mathematics.
 - 1. NM-NUM.9-12.1
Understand numbers, ways of representing numbers, relationships among numbers, and number systems.
 - 2. NM-ALG.9-12.3
Use mathematic models to represent and understand quantitative relationships.
 - 3. NM-ALG.9-12.4
Analyze change in various contexts.
 - 4. NM-PROB.PK-12.1
Build new math knowledge through problem solving skills.
 - 5. NM-PROB.PK-12.2
Solve problems that arise in mathematics and in other contexts.
 - 6. NM-PROB.PK-12.3
Apply and adapt a variety of appropriate strategies to solve problems.
 - 7. NM-PROB.COMM.PK-12.2
Communicate their math thinking coherently and clearly to peers, teachers, and others.
 - 8. NM-PROB.CONN.PK-12.2
Understand how mathematic ideas interconnect and build on one another to produce a coherent whole.
 - 9. NM-PROB.CONN.PK-12.3
Recognize and apply mathematics in contexts outside of the classroom.
 - 10. NM-PROB.REP.PK-12.2
Select, apply, and translate among mathematic representations to solve problems.
 - B. Science
Standard 12: Level III – Benchmarks 6,8
Level IV – Benchmark 4
- IV. Materials:
- A. Blackboard with colored chalk or whiteboard with colored markers.
 - B. Overhead projector.
 - C. Clear projection sheets to make overhead sheets of the "Presentation Notes" for the overhead projector.



- D. "Student Notes" copied for each student.
- E. Pencils, colored pencils, & calculators.
- F. Temperature Conversion Problems Worksheet.

V. Presentation Outline:

- A. 3 Temperature Scales
- B. Conversion Formulas
- C. Water Scales
- D. Conversion Problems
 - 1. Fahrenheit to Celsius
 - 2. Celsius to Fahrenheit
 - 3. Celsius to Kelvin
 - 4. Kelvin to Celsius
 - 5. Fahrenheit to Kelvin
 - 6. Kelvin to Fahrenheit

VI. Presentation:

- A. Use the presentation notes on an overhead projector, or
- B. Use the power point presentation.

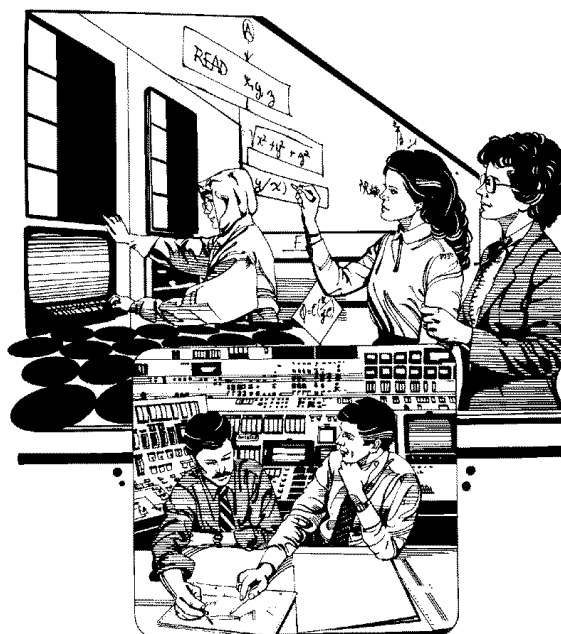
VII. Temperature Conversion Presentation: Student Notes ~
Students are to fill in the blank spaces in their notes during the presentation.

VIII. Independent Practice: Temperature Conversion Worksheet ~

- A. Homework: #'s 1- 30.
- B. Homework should be due the next day.

IX. Evaluation/Assessment: Temperature Conversion Quiz ~

Have students take this the next day after going over any questions about the HW.





MATH for SCIENCE

Temperature Conversions

I. Temperature Scales ~

There are **three** different temperature scales; **Fahrenheit**, **Celsius**, and **Kelvin**.

- A. In the United States the **Fahrenheit** scale is used to measure the environmental temperatures.
- B. Most other nations use the **Celsius** scale for environmental temperatures.
- C. The Standard International (SI) temperature scale used in science is the **Kelvin** scale.

II. Conversion Formulas ~

- A. Fahrenheit to Celsius

$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32^{\circ})$$

- B. Celsius to Fahrenheit

$$^{\circ}\text{F} = \frac{9}{5} ^{\circ}\text{C} + 32^{\circ}$$

- E. Fahrenheit to Kelvin

This is a two step Process.

Step 1. $^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$

Step 2. $^{\circ}\text{K} = ^{\circ}\text{C} + 273$

- C. Celsius to Kelvin

$$^{\circ}\text{C} = ^{\circ}\text{K} - 273^{\circ}$$

- D. Kelvin to Celsius

$$^{\circ}\text{K} = ^{\circ}\text{C} + 273^{\circ}$$

- F. Kelvin to Fahrenheit

This is a two step process.

Step 1. $^{\circ}\text{C} = ^{\circ}\text{K} - 273$

Step 2. $^{\circ}\text{F} = \frac{9}{5} ^{\circ}\text{C} + 32$

III. Water Scales

The temperatures for when water freezes and boils differ according to the temperature scale being used. See the following chart:

At sea level & 25 °C	Fahrenheit	Celsius	Kelvin
Water Boils at:	212° F	100° C	373° K
Water Freezes at:	32° F	0° C	273° K

IV. Conversion Problems ~

These temperature conversion problems are easily done by substituting the given temperature into the appropriate equation.

- A. Fahrenheit to Celsius

$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$$

1. **50 °F** to °C

$$^{\circ}\text{C} = \frac{5}{9} (50 - 32) = 10^{\circ}\text{C}$$

2. **-10 °F** to °C

$$^{\circ}\text{C} = \frac{5}{9} (-10 - 32) = -23.3^{\circ}\text{C}$$

3. **80 °F** to °C

$$^{\circ}\text{C} = \frac{5}{9} (80 - 32) = 26.7^{\circ}\text{C}$$

4. **98.6 °F** to °C

$$^{\circ}\text{C} = \frac{5}{9} (98.6 - 32) = 37^{\circ}\text{C}$$


 B. Celsius to Fahrenheit $^{\circ}\text{F} = \frac{9}{5}^{\circ}\text{C} + 32$

- | | |
|--|--|
| 1. 25 °C to °F
$^{\circ}\text{F} = \frac{9}{5}(\mathbf{25}) + 32 = \mathbf{77}^{\circ}\text{F}$ | 2. 0 °C to °F
$^{\circ}\text{F} = \frac{9}{5}(\mathbf{0}) + 32 = \mathbf{32}^{\circ}\text{F}$ |
| 3. 100 °C to °F
$^{\circ}\text{F} = \frac{9}{5}(\mathbf{100}) + 32 = \mathbf{212}^{\circ}\text{F}$ | 4. 45 °C to °F
$^{\circ}\text{F} = \frac{9}{5}(\mathbf{45}) + 32 = \mathbf{113}^{\circ}\text{F}$ |

 C. Celsius to Kelvin $^{\circ}\text{K} = ^{\circ}\text{C} + 273^{\circ}$

- | | |
|--|--|
| 1. 17 °C to °K
$^{\circ}\text{K} = \mathbf{17} + 273 = \mathbf{290}^{\circ}\text{K}$ | 2. 40 °C to °K
$^{\circ}\text{K} = \mathbf{40} + 273 = \mathbf{313}^{\circ}\text{K}$ |
| 3. 100 °C to °K
$^{\circ}\text{K} = \mathbf{100} + 273 = \mathbf{373}^{\circ}\text{K}$ | 4. 120 °C to °K
$^{\circ}\text{K} = \mathbf{120} + 273 = \mathbf{393}^{\circ}\text{K}$ |

 D. Kelvin to Celsius $^{\circ}\text{C} = ^{\circ}\text{K} - 273^{\circ}$

- | | |
|--|---|
| 1. 500 °K to °C
$^{\circ}\text{C} = \mathbf{500} - 273 = \mathbf{227}^{\circ}\text{C}$ | 2. 0 °K to °C
$^{\circ}\text{C} = \mathbf{0} - 273 = \mathbf{-273}^{\circ}\text{C}$ |
| 3. 250 °K to °C
$^{\circ}\text{C} = \mathbf{250} - 273 = \mathbf{-23}^{\circ}\text{C}$ | 4. 355 °K to °C
$^{\circ}\text{C} = \mathbf{355} - 273 = \mathbf{82}^{\circ}\text{C}$ |

 E. Fahrenheit to Kelvin $^{\circ}\text{C} = \frac{5}{9}(\text{F} - 32)$ $^{\circ}\text{K} = ^{\circ}\text{C} + 273$

- | | |
|--|--|
| 1. 77 °F to °K
$^{\circ}\text{C} = \frac{5}{9}(\mathbf{77} - 32)$
$^{\circ}\text{C} = \mathbf{25}^{\circ}\text{C}$
$^{\circ}\text{K} = \mathbf{25} + 273 = 298^{\circ}\text{K}$
$^{\circ}\text{K} = \mathbf{298}^{\circ}\text{K}$ | 2. 14 °F to °K
$^{\circ}\text{C} = \frac{5}{9}(\mathbf{14} - 32)$
$^{\circ}\text{C} = \mathbf{-10}^{\circ}\text{C}$
$^{\circ}\text{K} = \mathbf{-10} + 273$
$^{\circ}\text{K} = \mathbf{263}^{\circ}\text{K}$ |
|--|--|

 F. Kelvin to Fahrenheit $^{\circ}\text{C} = ^{\circ}\text{K} - 273$ $^{\circ}\text{F} = \frac{9}{5}^{\circ}\text{C} + 32$

- | | |
|---|---|
| 1. 358 °K to °F
$^{\circ}\text{C} = \mathbf{358} - 273$
$^{\circ}\text{C} = \mathbf{85}^{\circ}\text{C}$
$^{\circ}\text{F} = \frac{9}{5}(\mathbf{85}) + 32$
$^{\circ}\text{F} = 153 + 32$
$^{\circ}\text{F} = \mathbf{185}^{\circ}\text{F}$ | 2. 198 °K to °F
$^{\circ}\text{C} = \mathbf{198} - 273$
$^{\circ}\text{C} = \mathbf{-75}^{\circ}\text{C}$
$^{\circ}\text{F} = \frac{9}{5}(\mathbf{-75}) + 32$
$^{\circ}\text{F} = -135 + 32$
$^{\circ}\text{F} = \mathbf{-103}^{\circ}\text{F}$ |
|---|---|

Note for Teachers:

The highlighted areas in the “Presentation” are the areas left blank in the “Student Notes.” These highlighted areas act as the grading “key” for the “Student Notes.” It is recommended that each word or number the student successfully records on his/her “Notes” sheets be given either one half (0.5) of a point or one point. Giving students points for recording important information encourages them to stay focused during class and helps to ensure that students have complete information to study.



Temperature Conversions ~ Student Notes

Name: _____ Date: _____ Grade: _____

I. Temperature Scales ~

There are _____ different temperature scales; _____, _____, and _____.

F. In the United States the _____ scale is used to measure the environmental temperatures.

G. Most other nations use the _____ scale for environmental temperatures.

H. The Standard International (SI) temperature scale used in science is the _____ scale.

II. Conversion Formulas ~

A. Fahrenheit to Celsius

$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32^{\circ})$$

B. Celsius to Fahrenheit

$$^{\circ}\text{F} = \frac{9}{5} ^{\circ}\text{C} + 32^{\circ}$$

E. Fahrenheit to Kelvin

This is a two step Process.

$$\text{Step 1. } ^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$$

$$\text{Step 2. } ^{\circ}\text{K} = ^{\circ}\text{C} + 273$$

C. Celsius to Kelvin

$$^{\circ}\text{C} = ^{\circ}\text{K} - 273^{\circ}$$

D. Kelvin to Celsius

$$^{\circ}\text{K} = ^{\circ}\text{C} + 273^{\circ}$$

F. Kelvin to Fahrenheit

This is a two step process.

$$\text{Step 1. } ^{\circ}\text{C} = ^{\circ}\text{K} - 273$$

$$\text{Step 2. } ^{\circ}\text{F} = \frac{9}{5} ^{\circ}\text{C} + 32$$

III. Water Scales

The temperatures for when water freezes and boils differ according to the temperature scale being used. See the following chart:

At sea level & 25 °C	Fahrenheit	Celsius	Kelvin
Water Boiling	212° F	100° C	373° K
Water Freezing	32° F	0° C	273° K

IV. Conversion Problems ~

These temperature conversion problems are easily done by substituting the given temperature into the appropriate equation.

A. Fahrenheit to Celsius

$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$$

1. **50 °F** to °C

$$^{\circ}\text{C} = \frac{5}{9} (\underline{\quad} - 32) =$$

2. **-10 °F** to °C

$$^{\circ}\text{C} = \frac{5}{9} (\underline{\quad} - 32) =$$

3. **80 °F** to °C

$$^{\circ}\text{C} = \frac{5}{9} (\underline{\quad} - 32) =$$

4. **98.6 °F** to °C

$$^{\circ}\text{C} = \frac{5}{9} (\underline{\quad} - 32) =$$


 B. Celsius to Fahrenheit $^{\circ}\text{F} = \frac{9}{5}^{\circ}\text{C} + 32$

- | | |
|--|---|
| 1. 25 °C to °F
$^{\circ}\text{F} = \frac{9}{5}(\underline{\quad}) + 32 =$ | 2. 0 °C to °F
$^{\circ}\text{F} = \frac{9}{5}(\underline{\quad}) + 32 =$ |
| 3. 100 °C to °F
$^{\circ}\text{F} = \frac{9}{5}(\underline{\quad}) + 32 =$ | 4. 45 °C to °F
$^{\circ}\text{F} = \frac{9}{5}(\underline{\quad}) + 32 =$ |

 C. Celsius to Kelvin $^{\circ}\text{K} = ^{\circ}\text{C} + 273^{\circ}$

- | | |
|--|--|
| 1. 17 °C to °K
$^{\circ}\text{K} = \underline{\quad} + 273 =$ | 2. 40 °C to °K
$^{\circ}\text{K} = \underline{\quad} + 273 =$ |
| 3. 100 °C to °K
$^{\circ}\text{K} = \underline{\quad} + 273 =$ | 4. 120 °C to °K
$^{\circ}\text{K} = \underline{\quad} + 273 =$ |

 D. Kelvin to Celsius $^{\circ}\text{C} = ^{\circ}\text{K} - 273^{\circ}$

- | | |
|--|--|
| 1. 500 °K to °C
$^{\circ}\text{C} = \underline{\quad} - 273 =$ | 2. 0 °K to °C
$^{\circ}\text{C} = \underline{\quad} - 273 =$ |
| 3. 250 °K to °C
$^{\circ}\text{C} = \underline{\quad} - 273 =$ | 4. 355 °K to °C
$^{\circ}\text{C} = \underline{\quad} - 273 =$ |

 E. Fahrenheit to Kelvin $^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$ $^{\circ}\text{K} = ^{\circ}\text{C} + 273$

- | | |
|---|--|
| 1. 77 °F to °K
$^{\circ}\text{C} = \frac{5}{9}(\underline{\quad} - 32)$
$^{\circ}\text{C} = \mathbf{25^{\circ}\text{C}}$
$^{\circ}\text{K} = \underline{\quad} + 273 = 298^{\circ}\text{K}$
$^{\circ}\text{K} =$ | 2. 14 °F to °K
$^{\circ}\text{C} = \frac{5}{9}(\underline{\quad} - 32)$
$^{\circ}\text{C} = \mathbf{-10^{\circ}\text{C}}$
$^{\circ}\text{K} = \underline{\quad} + 273$
$^{\circ}\text{K} =$ |
|---|--|

 F. Kelvin to Fahrenheit $^{\circ}\text{C} = ^{\circ}\text{K} - 273$ $^{\circ}\text{F} = \frac{9}{5}^{\circ}\text{C} + 32$

- | | |
|---|--|
| 1. 358 °K to °F
$^{\circ}\text{C} = \underline{\quad} - 273$
$^{\circ}\text{C} = \mathbf{85^{\circ}\text{C}}$
$^{\circ}\text{F} = \frac{9}{5}(\mathbf{85}) + 32$
$^{\circ}\text{F} = 153 + 32$
$^{\circ}\text{F} =$ | 2. 198 °K to °F
$^{\circ}\text{C} = \underline{\quad} - 273$
$^{\circ}\text{C} = \mathbf{-75^{\circ}\text{C}}$
$^{\circ}\text{F} = \frac{9}{5}(\mathbf{-75}) + 32$
$^{\circ}\text{F} = -135 + 32$
$^{\circ}\text{F} =$ |
|---|--|



Temperature Conversions Worksheet

Name: _____ Date: _____ Grade: _____

A. Convert the following Fahrenheit temperatures to Celsius degrees and then to Kelvin degrees.

- | | |
|----------|------------|
| 1. 10 °F | 2. 65 °F |
| 3. 72 °F | 4. 25 °F |
| 5. 0 °F | 6. 100 °F |
| 7. 85 °F | 8. -10 °F |
| 9. 50 °F | 10. 110 °F |

B. Convert the following Celsius temperature to Fahrenheit degrees and then to Kelvin degrees.

- | | |
|------------|------------|
| 11. -10 °C | 12. 0 °C |
| 13. 18 °C | 14. 25 °C |
| 15. 42 °C | 16. 60 °C |
| 17. 10 °C | 18. -20 °C |
| 19. 32 °C | 20. 70 °C |

C. Complete the chart below with the missing temperatures.

Fahrenheit	Celsius	Kelvin
22.	21.	450 °K
23.	35 °C	24.
26.	25.	120 °K
105 °F	27.	28.
30.	29.	238 °K





Temperature Conversions Worksheet Answer Key

Name: _____ Date: _____ Grade: _____

A. Convert the following Fahrenheit temperatures to Celsius degrees and then to Kelvin degrees.

- | | |
|----------------------|-------------------------|
| 1. 10 °F 1. _____ | 2. 65 °F 2. _____ |
| 3. 72 °F 3. _____ | 4. 25 °F 4. _____ |
| 5. 0 °F 5. _____ | 6. 100 °F 6. _____ |
| 7. 85 °F 7. _____ | 8. -10 °F 8. _____ |
| 9. 50 °F 9. _____ | 10. 110 °F 10. _____ |

B. Convert the following Celsius temperature to Fahrenheit degrees and then to Kelvin degrees.

- | | |
|-------------------------|-------------------------|
| 11. -10 °C 11. _____ | 12. 0 °C 12. _____ |
| 13. 18 °C 13. _____ | 14. 25 °C 14. _____ |
| 15. 42 °C 15. _____ | 16. 60 °C 16. _____ |
| 17. 10 °C 17. _____ | 18. -20 °C 18. _____ |
| 19. 32 °C 19. _____ | 20. 70 °C 20. _____ |

C. Complete the chart below with the missing temperatures.

Fahrenheit	Celsius	Kelvin
22. 350 °F	21. 177 °C	450 °K
23. 95 °F	35 °C	24. 308 °K
26. -243.4 °F	25. -153 °C	120 °K
105 °F	27. 40.6 °C	28. 313.6 °K
30. -63 °F	29. -35 °C	238 °K

- | | | |
|---|--|--|
| 1. $^{\circ}\text{C} = \frac{5}{9}(10 - 32)$
$^{\circ}\text{C} = \frac{5}{9}(-22)$
$^{\circ}\text{C} = -12.2^{\circ}\text{C}$
$^{\circ}\text{K} = -12.2 + 273$
$^{\circ}\text{K} = 260.7^{\circ}\text{K}$ | 2. $^{\circ}\text{C} = \frac{5}{9}(65 - 32)$
$^{\circ}\text{C} = \frac{5}{9}(33)$
$^{\circ}\text{C} = 18.3^{\circ}\text{C}$
$^{\circ}\text{K} = 18.3 + 273$
$^{\circ}\text{K} = 291.3^{\circ}\text{K}$ | 3. $^{\circ}\text{C} = \frac{5}{9}(72 - 32)$
$^{\circ}\text{C} = \frac{5}{9}(40)$
$^{\circ}\text{C} = 22.2^{\circ}\text{C}$
$^{\circ}\text{K} = 22.2 + 273$
$^{\circ}\text{K} = 295.2^{\circ}\text{K}$ |
|---|--|--|



$$4. \quad ^\circ\text{C} = \frac{5}{9}(25 - 32)$$

$$^\circ\text{C} = \frac{5}{9}(-7)$$

$$^\circ\text{C} = -3.9 \text{ }^\circ\text{C}$$

$$^\circ\text{K} = -3.9 + 273$$

$$^\circ\text{K} = 269.1 \text{ }^\circ\text{K}$$

$$5. \quad ^\circ\text{C} = \frac{5}{9}(0 - 32)$$

$$^\circ\text{C} = \frac{5}{9}(-32)$$

$$^\circ\text{C} = -17.8 \text{ }^\circ\text{C}$$

$$^\circ\text{K} = -17.8 + 273$$

$$^\circ\text{K} = 255.2 \text{ }^\circ\text{K}$$

$$6. \quad ^\circ\text{C} = \frac{5}{9}(100 - 32)$$

$$^\circ\text{C} = \frac{5}{9}(68)$$

$$^\circ\text{C} = 37.8 \text{ }^\circ\text{C}$$

$$^\circ\text{K} = 37.8 + 273$$

$$^\circ\text{K} = 310.8 \text{ }^\circ\text{K}$$

$$7. \quad ^\circ\text{C} = \frac{5}{9}(85 - 32)$$

$$^\circ\text{C} = \frac{5}{9}(53)$$

$$^\circ\text{C} = 29.4 \text{ }^\circ\text{C}$$

$$^\circ\text{K} = 29.4 + 273$$

$$^\circ\text{K} = 302.4 \text{ }^\circ\text{K}$$

$$8. \quad ^\circ\text{C} = \frac{5}{9}(-10 - 32)$$

$$^\circ\text{C} = \frac{5}{9}(-42)$$

$$^\circ\text{C} = -23.3 \text{ }^\circ\text{C}$$

$$^\circ\text{K} = -23.3 + 273$$

$$^\circ\text{K} = 249.7 \text{ }^\circ\text{K}$$

$$9. \quad ^\circ\text{C} = \frac{5}{9}(50 - 32)$$

$$^\circ\text{C} = \frac{5}{9}(18)$$

$$^\circ\text{C} = 20 \text{ }^\circ\text{C}$$

$$^\circ\text{K} = 20 + 273$$

$$^\circ\text{K} = 293 \text{ }^\circ\text{K}$$

$$10. \quad ^\circ\text{C} = \frac{5}{9}(110 - 32)$$

$$^\circ\text{C} = \frac{5}{9}(78)$$

$$^\circ\text{C} = 43.3 \text{ }^\circ\text{C}$$

$$^\circ\text{K} = 43.3 + 273$$

$$^\circ\text{K} = 316.3 \text{ }^\circ\text{K}$$

$$11. \quad ^\circ\text{F} = \frac{9}{5}(-10) + 32$$

$$^\circ\text{F} = -18 + 32$$

$$^\circ\text{F} = 14 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = -10 + 273$$

$$^\circ\text{K} = 263 \text{ }^\circ\text{K}$$

$$12. \quad ^\circ\text{F} = \frac{9}{5}(0) + 32$$

$$^\circ\text{F} = 32 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = 0 + 273$$

$$^\circ\text{K} = 273 \text{ }^\circ\text{K}$$

$$13. \quad ^\circ\text{F} = \frac{9}{5}(18) + 32$$

$$^\circ\text{F} = 32.4 + 32$$

$$^\circ\text{F} = 64.4 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = 18 + 273$$

$$^\circ\text{K} = 291 \text{ }^\circ\text{K}$$

$$14. \quad ^\circ\text{F} = \frac{9}{5}(25) + 32$$

$$^\circ\text{F} = 45 + 32$$

$$^\circ\text{F} = 77 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = 25 + 273$$

$$^\circ\text{K} = 298 \text{ }^\circ\text{K}$$

$$15. \quad ^\circ\text{F} = \frac{9}{5}(42) + 32$$

$$^\circ\text{F} = 75.6 + 32$$

$$^\circ\text{F} = 107.6 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = 42 + 273$$

$$^\circ\text{K} = 315 \text{ }^\circ\text{K}$$

$$16. \quad ^\circ\text{F} = \frac{9}{5}(60) + 32$$

$$^\circ\text{F} = 108 + 32$$

$$^\circ\text{F} = 140 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = 60 + 273$$

$$^\circ\text{K} = 333 \text{ }^\circ\text{K}$$

$$17. \quad ^\circ\text{F} = \frac{9}{5}(10) + 32$$

$$^\circ\text{F} = 18 + 32$$

$$^\circ\text{F} = 50 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = 10 + 273$$

$$^\circ\text{K} = 283 \text{ }^\circ\text{K}$$

$$18. \quad ^\circ\text{F} = \frac{9}{5}(-20) + 32$$

$$^\circ\text{F} = -36 + 32$$

$$^\circ\text{F} = -4 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = -20 + 273$$

$$^\circ\text{K} = 253 \text{ }^\circ\text{K}$$

$$19. \quad ^\circ\text{F} = \frac{9}{5}(32) + 32$$

$$^\circ\text{F} = 57.6 + 32$$

$$^\circ\text{F} = 89.6 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = 32 + 273$$

$$^\circ\text{K} = 305 \text{ }^\circ\text{K}$$

$$20. \quad ^\circ\text{F} = \frac{9}{5}(70) + 32$$

$$^\circ\text{F} = 126 + 32$$

$$^\circ\text{F} = 158 \text{ }^\circ\text{F}$$

$$^\circ\text{K} = 70 + 273$$

$$^\circ\text{K} = 343 \text{ }^\circ\text{K}$$

$$21. \quad ^\circ\text{C} = 450 - 273$$

$$^\circ\text{C} = 177 \text{ }^\circ\text{C}$$



22. $^{\circ}\text{F} = \frac{9}{5}(177) + 32$
 $^{\circ}\text{F} = 318.6 + 32$
 $^{\circ}\text{F} = 350.6$ $^{\circ}\text{F}$

23. $^{\circ}\text{F} = \frac{9}{5}(35) + 32$
 $^{\circ}\text{F} = 63 + 32$
 $^{\circ}\text{F} = 95$ $^{\circ}\text{F}$

24. $^{\circ}\text{K} = 35 + 273$
 $^{\circ}\text{K} = 308$ $^{\circ}\text{K}$

25. $^{\circ}\text{C} = 120 - 273$
 $^{\circ}\text{C} = -153$ $^{\circ}\text{C}$

26. $^{\circ}\text{F} = \frac{9}{5}(-153) + 32$
 $^{\circ}\text{F} = -275.4 + 32$
 $^{\circ}\text{F} = -243.4$ $^{\circ}\text{F}$

27. $^{\circ}\text{C} = \frac{5}{9}(105 - 32)$
 $^{\circ}\text{C} = \frac{5}{9}(73)$
 $^{\circ}\text{C} = 40.6$ $^{\circ}\text{C}$

28. $^{\circ}\text{K} = 40.6 + 273$
 $^{\circ}\text{K} = 313.6$ $^{\circ}\text{K}$

29. $^{\circ}\text{C} = 238 - 273$
 $^{\circ}\text{C} = -35$ $^{\circ}\text{C}$

30. $^{\circ}\text{F} = \frac{9}{5}(-35) + 32$
 $^{\circ}\text{F} = -63 + 32$
 $^{\circ}\text{F} = -31$ $^{\circ}\text{F}$

Worksheet Grading Rubric: 120/120 Points

#	Correct 1 st Equation (1 pt each)	Correct Calculations (1 pt each)	Correct 2 nd Equation (1 pt each)	Correct Answer (1 pt each)	Total Points (4 pts each) (120 pts Possible)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					
Totals					



Temperature Conversion Quiz

Name: _____ Date: _____ Grade: _____

1. _____ Which temperature is NOT a correct boiling temperature for water?
 A. 212 °F B. 100 °C C. 100 °F D. 373 °K

2. _____ Which temperature is NOT a correct freezing temperature for water?
 A. 0 °C B. 0 °F C. 273 °K D. 32 °F

3. _____ Which equation is the correct equation to choose when the Celsius temperature must be calculated from a given Fahrenheit temperature?
 A. $^{\circ}\text{C} = ^{\circ}\text{F} + 273$ C. $^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$
 B. $^{\circ}\text{C} = \frac{9}{5} ^{\circ}\text{F} + 32$ D. $^{\circ}\text{C} = \frac{5}{9} ^{\circ}\text{F} - 32$

4. _____ Which equation is the correct equation to choose when the Fahrenheit temperature must be calculated from a given Celsius temperature?
 A. $^{\circ}\text{F} = \frac{9}{5} ^{\circ}\text{C} + 32$ C. $^{\circ}\text{F} = \frac{5}{9} ^{\circ}\text{C} + 32$
 B. $^{\circ}\text{F} = \frac{5}{9} (^{\circ}\text{C} - 32)$ D. $^{\circ}\text{F} = \frac{9}{5} (^{\circ}\text{C} + 32)$

5. _____ Which equation is the correct equation to choose when the Kelvin temperature must be calculated from a given Celsius temperature?
 A. $^{\circ}\text{K} = ^{\circ}\text{C} - 273$ C. $^{\circ}\text{K} = \frac{9}{5} ^{\circ}\text{C} - 32$
 B. $^{\circ}\text{K} = \frac{5}{9} ^{\circ}\text{C} + 32$ D. $^{\circ}\text{K} = ^{\circ}\text{C} + 273$

6. _____ Convert 20 °C to °F.
 A. 68 °F B. - 6.7 °F C. 4 °F D. 28.9 °F

7. _____ Convert 86 °F to °C.
 A. 65.6 °C B. 30 °C C. 79.8 °C D. 54 °C

8. _____ Convert 65 °C to °K.
 A. - 208 °K B. 165 °K C. 149 °K D. 338 °K

9. _____ Convert 415 °K to °C.
 A. 142 °C B. 688 °C C. 215 °C D. 212.8 °C

10. _____ Convert normal human body temperature of 98.6 °F to °K.
 A. 392.9 °K B. 349.8 °K C. 310 °K D. - 236 °K



Temperature Conversion Quiz Answer Key

Name: _____ Date: _____ Grade: _____

1. C Which temperature is NOT a correct boiling temperature for water?
 A. 212 °F B. 100 °C C. 100 °F D. 373 °K

2. B Which temperature is NOT a correct freezing temperature for water?
 A. 0 °C B. 0 °F C. 273 °K D. 32 °F

3. C Which equation is the correct equation to choose when the Celsius temperature must be calculated from a given Fahrenheit temperature?
 A. °C = °F + 273 C. °C = $\frac{5}{9}(\text{°F} - 32)$
 B. °C = $\frac{9}{5}\text{°F} + 32$ D. °C = $\frac{5}{9}\text{°F} - 32$

4. A Which equation is the correct equation to choose when the Fahrenheit temperature must be calculated from a given Celsius temperature?
 A. °F = $\frac{9}{5}\text{°C} + 32$ C. °F = $\frac{5}{9}\text{°C} + 32$
 B. °F = $\frac{5}{9}(\text{°C} - 32)$ D. °F = $\frac{9}{5}(\text{°C} + 32)$

5. D Which equation is the correct equation to choose when the Kelvin temperature must be calculated from a given Celsius temperature?
 A. °K = °C - 273 C. °K = $\frac{9}{5}\text{°C} - 32$
 B. °K = $\frac{5}{9}\text{°C} + 32$ D. °K = °C + 273

6. A Convert 20 °C to °F.
 A. 68 °F B. - 6.7 °F C. 4 °F D. 28.9 °F

7. B Convert 86 °F to °C.
 A. 65.6 °C B. 30 °C C. 79.8 °C D. 54 °C

8. D Convert 65 °C to °K.
 A. - 208 °K B. 165 °K C. 149 °K D. 338 °K

9. A Convert 415 °K to °C.
 A. 142 °C B. 688 °C C. 215 °C D. 212.8 °C

10. C Convert normal human body temperature of 98.6 °F to °K.
 A. 392.9 °K B. 349.8 °K C. 310 °K D. - 236 °K



6. $^{\circ}\text{F} = \frac{9}{5}^{\circ}\text{C} + 32$
 $^{\circ}\text{F} = \frac{9}{5}(20) + 32$
 $^{\circ}\text{F} = 36 + 32$
 $^{\circ}\text{F} = 68^{\circ}\text{C}$

7. $^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$
 $^{\circ}\text{C} = \frac{5}{9}(86 - 32)$
 $^{\circ}\text{C} = \frac{5}{9}(54) = 30^{\circ}\text{C}$

8. $^{\circ}\text{K} = ^{\circ}\text{C} + 273$
 $^{\circ}\text{K} = 65 + 273$
 $^{\circ}\text{K} = 338^{\circ}\text{K}$

9. $^{\circ}\text{C} = ^{\circ}\text{K} - 273$
 $^{\circ}\text{C} = 415 - 273$
 $^{\circ}\text{C} = 142^{\circ}\text{C}$

10. $^{\circ}\text{C} = \frac{5}{9}(98.6 - 32)$ $^{\circ}\text{K} = 37 + 273$
 $^{\circ}\text{C} = \frac{5}{9}(66.6)$ $^{\circ}\text{K} = 310^{\circ}\text{K}$
 $^{\circ}\text{C} = 37^{\circ}\text{C}$

Quiz Grading Rubric: 22/20 Points

Problems	Correct Answer (2 pts each)	Total Points (8 pts Possible)
1.		
2.		
3.		
4.		

Problems	Correct Equation (1 pt each)	Correct Substitution & Calculations (1 pt each)	Correct Answer with Units (1 pt each)	Total Points (3 pts each) (6 pts Possible)
6.				
7.				

Problems	Correct Equation (1 pt each)	Correct Answer & Units (1 pt each)	Total Points (2 pts each) (8 pts Possible)
8.			
9.			
10 a.			
10 b.			

