



# Practice Worksheet on Energy and Measurement

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Subject: Science

Date: 1/12/2025

## Long Answer Questions

1. Explain the process of scientific inquiry and why repeating experiments is crucial.
2. List and briefly describe at least five different forms of energy.
3. Distinguish between renewable and non-renewable energy sources, giving examples and discussing their environmental effects.
4. Trace the evolution of energy use from early humans to the present day. What key advancements have changed energy usage?
5. Explain how energy flows through food chains and webs. Describe the 10% law and its impact on biomass.
6. Explain how heat travels through conduction, convection, and radiation, and how this affects climates.

7. Define thermal conductors and insulators, give examples, and explain how they affect heat transfer. Define thermal expansion and its applications.

8. Compare and contrast Celsius, Fahrenheit, and Kelvin temperature scales. Explain how a thermometer works.

## Multiple Choice Questions

1. How does heat travel, and what effects does it have?

- a) Heat only travels through conduction.
- b) Heat transfer only affects local climates.
- c) Heat travels through conduction, convection, and radiation, influencing both local and global climates.
- d) Heat transfer is only relevant to energy conservation.

2. Approximately what percentage of energy is transferred from one trophic level to the next in a food chain?

- a) 100%
- b) 10%
- c) 50%
- d) 25%

3. What is the main difference between renewable and non-renewable energy sources?

- a) Renewable sources are replenished naturally; non-renewable sources are finite.
- b) Renewable sources are more expensive; non-renewable sources are cheaper.
- c) Renewable sources cause pollution; non-renewable sources are clean.
- d) Renewable sources are unreliable; non-renewable sources are reliable.

4. Which of the following is a base unit in the metric system for measuring length?

- a) Gram
- b) Liter
- c) Meter
- d) Second

5. What process involves observation, hypothesis, experimentation, and conclusion?

- a) Hypothesis
- b) Scientific Inquiry
- c) Conclusion
- d) Experiment

6. Which of these materials is a good thermal insulator?

- a) Iron
- b) Wood
- c) Steel
- d) Aluminum

7. What is the principle of the conservation of energy?

- a) Energy is created and destroyed.
- b) Energy is neither created nor destroyed, only transformed.
- c) Energy is mostly destroyed.
- d) Energy is always created.

8. Which of these tools is primarily used to measure temperature?

- a) Microscope
- b) Ruler
- c) Thermometer
- d) Beaker

# Answer Key

## Long Answer Questions - Expected Responses

1. Explain the process of scientific inquiry and why repeating experiments is crucial.

Expected Answer: Explanation of scientific inquiry as a process of investigation involving observation, hypothesis, experimentation, and conclusion. Mention the importance of repeatable experiments.

2. List and briefly describe at least five different forms of energy.

Expected Answer: List forms of energy like kinetic, potential, thermal, light, sound, electrical, chemical, and nuclear, describing each briefly.

3. Distinguish between renewable and non-renewable energy sources, giving examples and discussing their environmental effects.

Expected Answer: Define renewable (solar, wind, hydro) and non-renewable (fossil fuels, nuclear) energy sources, providing examples and outlining their environmental impacts.

4. Trace the evolution of energy use from early humans to the present day. What key advancements have changed energy usage?

Expected Answer: Trace the evolution of energy use from early humans to modern times, highlighting key technological advancements.

5. Explain how energy flows through food chains and webs. Describe the 10% law and its impact on biomass.

Expected Answer: Describe how energy flows through food chains and webs, explaining the 10% law and its implications for biomass at each trophic level.

6. Explain how heat travels through conduction, convection, and radiation, and how this affects climates.

Expected Answer: Explain how heat is transferred via conduction, convection, and radiation. Show how this affects local and global climates.

7. Define thermal conductors and insulators, give examples, and explain how they affect heat transfer. Define thermal expansion and its applications.

Expected Answer: Define thermal conductors and insulators, providing examples and explaining how they affect heat transfer. Explain thermal expansion and its real-world applications.

8. Compare and contrast Celsius, Fahrenheit, and Kelvin temperature scales. Explain how a thermometer works.

Expected Answer: Compare and contrast different temperature scales (Celsius, Fahrenheit, Kelvin), explaining their origins and uses. Explain how thermometers work.

## Multiple Choice Questions – Correct Answers

1. How does heat travel, and what effects does it have?

Correct Answer: Heat travels through conduction, convection, and radiation, influencing both local and global climates.

2. Approximately what percentage of energy is transferred from one trophic level to the next in a food chain?

Correct Answer: 10%

3. What is the main difference between renewable and non-renewable energy sources?

Correct Answer: Renewable sources are replenished naturally; non-renewable sources are finite.

4. Which of the following is a base unit in the metric system for measuring length?

Correct Answer: Meter

5. What process involves observation, hypothesis, experimentation, and conclusion?

Correct Answer: Scientific Inquiry

6. Which of these materials is a good thermal insulator?

Correct Answer: Wood

7. What is the principle of the conservation of energy?

Correct Answer: Energy is neither created nor destroyed, only transformed.

8. Which of these tools is primarily used to measure temperature?

Correct Answer: Thermometer