



Science Focus Unit 3 – Heat and Temperature
Review Booklet

Focusing Questions:

What heat-related technologies do we use to meet human needs?

What scientific principles are these technologies based on?

What implications do these technologies have for sustainable use of resources?

Heat-related Technology	Science Principle	Implication for Sustainability

Guiding Questions and Activities to Help you Study Key Concepts

Topic 1 Thermal Energy

Can you identify how **Thermal Energy** is used?

How is temperature **measured**?

Identify the following **relative temperatures**:

freezing water _____ °C

boiling water _____ °C

normal body temperature _____ °C

comfortable room temperature _____ °C

Topic 2 Measuring Temperature - Technological devices and systems using **Thermal Energy**

What is a **thermocouple**?



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What is a **bimetallic strip**?

What is a **recording thermometer**?

What is an infrared **thermogram**?

Topic 3 The **Particle Model of Matter**

What are the 4 key points addressed in the **Particle Model of Matter**?

Explain how gas particles can be **compressed** and what happens to the volume of the gas.

What **properties** distinguish solids, liquids and gases?

Define **Thermal Energy**, **Heat** and **Temperature** in terms of the **Particle Theory**.

Thermal Energy _____

Heat _____

Temperature _____



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Topic 4 Thermal Expansion and Contraction

Describe **expansion** and **contraction** of solids liquids and gases in terms of the **Particle Model**.

Expansion _____

Contraction _____

Why are two different **metals** used to make a **thermocouple** and a **thermostat** (bimetallic strip)?

Topic 5 **Changes of State**: melting, freezing, vaporization, condensation and sublimation

Describe the Changes of State and the terminology when a substance undergoes a specific change.

Melting		
Freezing		
Evaporation		
Condensation		
Sublimation		



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Topic 6 Energy Transfer Systems

Explain, using an **operational definition**, the differences between **conduction**, **convection** and **radiation** - in terms of **energy transfer**.

Conduction _____

Convection _____

Radiation _____

Describe how a **convection current** is created.

Illustration

How is **energy transferred** differently in solids than it is in gases and liquids?

What are the five *common characteristics* that are involved in all **energy transfer systems**?



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Topic 7 Sources of Thermal Energy: Advantages and disadvantages of using Fossil Fuels Thermal Pollution
Greenhouse Effect

Describe the **impacts** different energy sources have on the environment.

Thermal Energy Source	Impact on the Environment
chemical	
electrical	
mechanical	
nuclear	
geothermal	
solar	
wind	
tidal	
fossil fuels	

The **Green Solution** involves using alternative energy. Why is it called the **Green Solution** and what positive impacts does it have on the environment?

Alberta's main source of energy is **Fossil Fuels**. Describe this energy resource in terms of its abundance and importance to Albertans.

Describe what happens to create the **Greenhouse Effect**.

Illustration



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What is **Thermal Pollution** and what causes it?

Topic 8 Conservation Technologies and Strategies to help us Conserve Fossil Fuels and make their Use Safer.

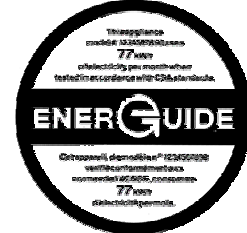
Provide an operational definition of **cogeneration**.

Describe technologies and practices that **conserve fossil fuel resources**.

How does a **programmable thermostat** work?

What is an **ENERGUIDE** label and what does it tell the consumer?

Illustration of EnerGuide label



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Notes Index <http://www.edquest.ca/Notes/noteindex7.html>
Review Quiz Index <http://www.edquest.ca/Tests/testindex7sf.html>

SCIENCE FOCUS 7 Textbook

Unit At A Glance p. 262

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