

## School Energy Audit Investigations – Temperature

Complete the worksheet below for each room in the building you wish to audit.

You will need: Infrared Thermometer.

### Introduction

Heating, Ventilating and Air Conditioning (HVAC) systems help maintain indoor air quality and keep building occupants comfortable. Occupants who understand their role and are engaged in the flow of energy through the building enhance the operation and performance, saving energy and money and reducing your building's carbon footprint.

### Part 1 – General Temperature Room Audit

Begin to survey each of the rooms in the building you choose to audit by filling out the table below. Indicate what room you are auditing and the room number (if applicable).

A. What room are you auditing? \_\_\_\_\_ Room number \_\_\_\_\_

B. What is the outside temperature today in degrees Fahrenheit and/or Celsius?

\_\_\_\_\_ °F \_\_\_\_\_ °C

General Temperature Audit Questions	YES	NO
C. Is the HVAC system operating at this time of year?		
D. Are windows closed to keep heating and cooling inside?		
E. Are doors (including classroom doors) closed to keep the HVAC system running efficiently?		
F. Are any window cracked or broken?		
G. Do any doors noticeably leak air?		
H. Are any heating/cooling/air circulating vents in the room blocked by books, papers, jackets, plants, etc.?		
I. Does the room have a thermostat located on the wall?		
J. If there is a thermostat, is it blocked by furniture, equipment, posters, etc.?		
K. If there is a thermostat, is it located near a heat/cold source or air vents?		
L. Are there additional heating or cooling appliances in the room (space heaters, fans, portable AC units)? If yes, list the type of appliance on the line below.		

M. Additional heating/cooling appliances in room:

### Part 2 – Temperature Measurement

Complete the table below to check the accuracy of the room thermostat. Use the infrared thermometer to measure and record the room temperature in degrees Fahrenheit and/or degrees Celsius in the following locations as described.

Temperature Measurement		
Room Location	Temperature in degrees Fahrenheit (°F) and/or Celsius (°C)	
A. Front of Room	°F	°C
B. Center of Room	°F	°C
C. Back of Room	°F	°C
D. Average Room Temperature (A+B+C) ÷ 3	°F	°C

- E. Determine if the room thermostat is working correctly by comparing its temperature reading to the calculated average room temperature from part 2 - D. If the average room temperature is within 2 degrees of the thermostat reading, then the thermostat is working correctly.

If your classroom does not have a thermostat, use the table below to determine if your average classroom temperature from part 2-D is within 2 degrees of the recommended temperature setpoints.

Recommended Temperature Setpoints	
Heating	Cooling
68°F / 20°C	78°F / 25.5 °C

Does your classroom thermostat come within 2 degrees of the recommended temperature setpoints?

Does your classroom thermostat appear to be working correctly?

- F. If you answered no, what could be some possible reasons for this (hint: look at your answers from Part 1)?

- G. Are there other ways that your classroom could improve its heating, ventilating and air conditioning (HVAC) energy demands? Explain.

### Extension – Detecting Air Leaks

Use your infrared thermometer to detect air leaks. Take temperature measurements of the floor, around windows and doors and on classroom walls that face the outdoors. Use an infrared camera to look at these areas. Can you detect lower or higher temperatures in these locations? Can you visibly see warmer/cooler areas indicated by different colors on the infrared camera? What are some reasons for these temperature differences? Are there ways that these temperature differences could be decreased or eliminated? Talk to your facilities team about your findings, ask them for suggestions or work together to find solutions.

***For additional insight on how to use an infrared thermometer and possible energy saving solutions for heating and cooling rooms see KEEP's School Energy Audit Best Practices guide.***