

# School Energy Investigations - Lighting

Complete the worksheet below for each room in your building you wish to audit. You will need: Light meter, "Recommended Light Levels" chart.

Name \_\_\_\_\_  
Date \_\_\_\_\_  
Room \_\_\_\_\_

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## Introduction

Lighting is one of the largest users of energy, accounting for 25% or more of an office or school building's electrical use and 10% or more of home electrical use. It is also the system occupants have the most control over day-to-day. Investing in new lighting technologies, installing sensors, and turning lights off when they aren't needed can have a major impact on decreasing building energy use.

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## Background

1. Were the lights on or off when you got to the room?  On  Off
2. Were people in the room when you got there?  Yes  No
3. What type of overhead lighting is used in the room?  
 Incandescent  Fluorescent  Light-emitting Diode (LED)  Other \_\_\_\_\_
4. Are the overhead lights turned on and off automatically by motion or photo sensors?  Yes  No
5. Can overhead lights be switched on and off separately by row, fixture or bulb?  Yes  No
6. Does the room receive natural light through windows or skylights?  Yes  No
7. What other lighting appliances are in the room?  
 Desk Lamp  Floor Lamp  String Lights  Other \_\_\_\_\_

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## Activity 1 - Recommended Light Levels

1. Use a light meter to measure and record the foot-candles of light in the following locations in Table 1.

Room Location	Light Level in Foot-Candles As measured on the work surface
A. Front of the room	_____ fc
B. Center of the room	_____ fc
C. Back of the room	_____ fc
D. Room Average (A+B+C)/3=	_____ fc

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2. Use the "Recommended Light Levels" chart. What is the recommended light level for this type of room?  
 \_\_\_\_\_ fc

3. Based on the calculated room average (from Table 1), is the room over lit, under lit, or within recommended range?

Over lit    Under lit    Within recommended range

## Activity 2 - Light and Your Load

Use the table below to calculate the cost of lighting the room for one year.

A. Room Name/ Number	B. Number of Fixtures <small>Overhead lights only</small>	C. Number of Lamps per fixture <small>Usually 2, 3, or 4 light bulbs per fixture</small>	D. Type of Lamp <small>Ask your teacher</small>	E. Watts per fixture* <small>See table below</small>	F. Average # of Hours on per day <small>Estimated in quarter-hour (.25) increments</small>
G. Watt-hours used per day (B x E x F) =					
H. Watt-hours used per month (G x 22 days) =					
I. Total kilowatt-hours per month (H ÷ 1,000 watts) =					
J. Cost of lighting room for one month (I x \$0.13/kWh) =					
K. Cost of lighting room for one school year (J x 10 months) =					

Approximate Wattages for Fixtures			
	T8 32W 4' fluorescent	T5 28W 4' fluorescent	T8 12W 4' LED
1 lamp	32 watts	32 watts	12 watts
2 lamp	59 watts	63 watts	24 watts
3 lamp	88 watts	95 watts	36 watts
4 lamp	117 watts	126 watts	48 watts

\*If you cannot determine approximate wattage based upon the table above, use 126 watts per fixture.

**Congratulations! You completed a simple energy audit of room lighting.**

Based on your observations and results above, recommend ways to save energy used by lighting in this room.