

## Lighting

The amount of lighting needed, like many commodities, is more dependent upon how it is used than on how much you have.

It is a given fact that the intensity of light is inversely proportional to the square of the distance from the source. This means that there is more light on your book from a 10 watt bulb 2 feet away ( $10/4 = 2.5$ ), than you would receive from a 200 watt bulb that was 10 feet away ( $200/100 = 2$ ). Going a little further, you would find the same amount of light one foot away from a 1 watt bulb, as you would ten feet away from a 100 watt bulb.

Another way to enhance the utility of light is by reflecting it in the direction you need it. I have used small automotive fixtures with built-in reflectors for effective low-power reading lamps in camping situations. Look into clearance lights and such at a local auto parts store. You may have to throw away a colored lens, but you can probably find what you need.

Even within the conventional lifestyle, I have sometimes backed up lighting with shiny aluminum foil, when I could do it in a way that it was not normally visible.

Still another way to optimize your lighting is to use levels that are appropriate for the activity at hand. For instance, normal movements around the house and relaxed conversation are comfortably managed at greatly reduced light levels, and dinner by candle-light is also quite appropriate. In fact, I find a lower light level environment more relaxing. Save the kilowatts for tedious hand-work, reading, and locating lost contact lenses.

If you put the light where you need it, and in the amounts that are appropriate, you can substantially lighten your bill.

### *Oil Lamp*

Have you ever found, or even pictured yourself in a situation where you wanted light and there was simply none available? This lamp is so simple and versatile that it can provide you with basic lighting under almost any circumstance.

The only materials required are an aluminum beverage can and a tuft of fibrous material, such as toilet paper or cotton cloth. I even used a piece of mineral fiber insulation during one minor emergency, and powered it with a small amount of motor oil. The only tool required is a pair of scissors or a sharp knife – in fact, I have used no more than a sharp pencil and my bare hands.



The lamp may be fueled by animal fat, vegetable oil, or mineral-based greases and oils. I have had some problems with additives in motor oil clogging the wick and self-extinguishing after short periods, but even that doesn't make them entirely useless.

Begin by cutting or tearing the can in half, and turning it over. Cut or tear a circle about 2 inches across from the unused portion of the can and poke a hole in it that is 1/4" to 3/8" in diameter. Wad up your fibrous material into about a 1" ball and pull about a 1/4" portion through the hole.

To use the lamp, fill the depression in the inverted can with your oil or grease and work some of the fuel into both sides of the wick. Lay the wick assembly on the fuel and light.

If the fuel is a solid grease or fat of some kind, the heat of the flame will soon cause it to melt and flow, like an oil.

The intensity of the basic lamp is roughly equivalent to that of a candle, but its effectiveness can be enhanced by the use of a reflector (from the unused portion of the can). It can also be improved by the addition of a simple chimney.

A chimney support may be made by cutting two pieces of wood to just over 1/8" square by 1-1/2" long. Lay these parallel, about 1-1/4" apart on either side of the wick. Pull through an extra 1/8" of wick. Cut a disk of aluminum about 2-1/2" in diameter with a 1/2" hole in the center. Lay this piece on the sticks with the hole around the wick. Set a small chimney on the disk.

If you are really hard up for a chimney, break the bottom out of a small bottle or jar by holding it under water and knocking the bottom out from the inside. Use a metal rod (large bolt?) inserted through the opening. The water will keep the glass from flying. I am sure there are better ways, but this is the best of my experience to this point.

## Other Sources

In order to keep electrical hazards to minimum, I recommend keeping electrical circuits to a low voltage level. A 12 volt system makes the significant variety of automotive lighting sources available.

Among electrical lighting options incandescent bulbs are the least efficient. Fluorescent bulbs are several times as efficient as incandescent bulbs, and last several times as long. These do require special circuits to create the high voltages needed however. LED's are more efficient than either, and are almost as simple to power as incandescents.

For portable low levels of personal lighting it would be hard to beat solar garden lights for cost and portability. I think if I was going to read by one I would probably make a base for it like a table lamp. Perhaps even a slender floor version might work if it rose just high enough to clear the arm of your chair or sofa to remain within range of your activity. At the moment, I'm thinking of telescoping 1/2" conduit into 3/4" conduit to make the height adjustable. How about a 5lb barbell weight for a base?

However you mount it, it would need to be easily removable, so it could be taken outside for its daily feeding of sunshine.