

You are the light of the world. (Matt 5:13-16)

God is light; in him there is no darkness at all. (1 Jn 1:5-10)

You've probably heard the statistic that 'on a dark night, you can see the light of a candle from over a mile-and-a-half away*', and that's true but, I don't know about you, I don't often stand a thirty-minute walk away from a candle on a pitch black night. For a start, pitch black nights are in short supply round here.

So here's a more 21st century version. Could you take out your phone, please, if you've got one with you?

You can see the screen pretty well, yes? Now, turn down the brightness, as low as it will go. If you've got one of those night-time extra-dim things, put that on too. I use my phone as an alarm clock, so I have bedtime mode plus dark theme plus extra-super dimmer. Seriously, my screen looks black. In the daytime, I can't see it at all.

Yet if I wake in the night and want to know if it's nearly getting-up time, I scrabble for my phone and blearily tap the screen – wow! It's plenty bright! What looks dim in the daytime, almost black, is a whole load of light at 3 am when I need to get up to go the loo.

Now we know that God is light; in him there is no darkness at all—and God is a whole load more light than my little phone—but God hasn't kept that light to himself. He's put some of it in you, in me, in each one of us. And I don't mean just the grown ups here. This applies to kids too. If you love Jesus, then God has put his light in you. But why?

Back to your phone. Put the brightness up so that you can see what you are doing, then turn the torch on.

Jesus said, "You are the light of the world. People do not light a lamp and put it under a bowl. Instead they put it on its stand, and it gives light to everyone in the house."

Today we would say, "No one turns on their torch then puts it facing down." Do that. Pointless, isn't it? Why would anyone do that? "Instead, hold your phone high and let your light shine before others, that they may glorify your Father in heaven."

You might not think your light is much, hardly anything at all, God couldn't use that, but remember that super-dim screen. It didn't look much, but how bright was it at 3am? Wow! Plenty bright!

In a world that has little light of Jesus, you can, I can, we can, be the light that everyone needs.

* 1.6 miles is quoted on a physics website as the maximum visible distance of a candle, and the maths checks out. You may have heard people say 30 miles, but this seems unlikely. (See below, *For Geeks*.)

For Geeks:

The light of the candle has to be spread over the surface of a sphere with radius = your distance away.

At a distance of 1m from the candle, the sphere has a surface area of
 $4 \times \pi \times 1^2 = 12.57\text{m}^2$

1 candle power is 12.57 lumens, and lux (light intensity) is lumens per square metre, so that's $12.57 \div 12.57 = 1$ lux. In other words, 1 lux is the light of a standard candle at a distance of 1m (Don't you just love the metric system?)

At 1.6 miles = 2575m, the sphere has a surface of over 83 million square metres ($4 \times \pi \times 2575^2 = 83,353,000\text{m}^2$).

Those 12.57 lumens from our candle get spread thinly, leaving merely 1.5×10^{-7} lux ($= 1.2 \times 10^{-9} \text{ W/m}^2$) to hit your eye, which is either just above or just below the limit of human visibility. Depending on what they are measuring, I've seen figures of:

- $1 \times 10^{-10} \text{ W/m}^2$
- $4.0 \times 10^{-11} \text{ W/m}^2$
- $1 \times 10^{-6} \text{ lux}$
- $1 \times 10^{-6} \text{ cd/m}^2$

Conclusion

According to these calculations, the claim that 'on a clear, dark night, a candle flame can be seen as far away as 30 miles / 48 kilometres', seems unlikely to be correct. At almost 20 times the distance used here, 30 miles would give you only $1/400$ of the light, which takes it below a tenth of even the most generous lower limit of visibility. The figure of 1.6 miles is more likely to be right. For a ballpark, think one-and-a-half miles / two-and-a-half km.

Formulae

- $\text{lux} = \text{lumens/m}^2$
- $1 \text{ lux} = 0.0079 \text{ W/m}^2$
- $1 \text{ candle power (candela)} = 12.57 \text{ lumens}$
- $\text{Surface of a sphere} = 4\pi r^2$
- $1 \text{ mile} = 1609\text{m}$