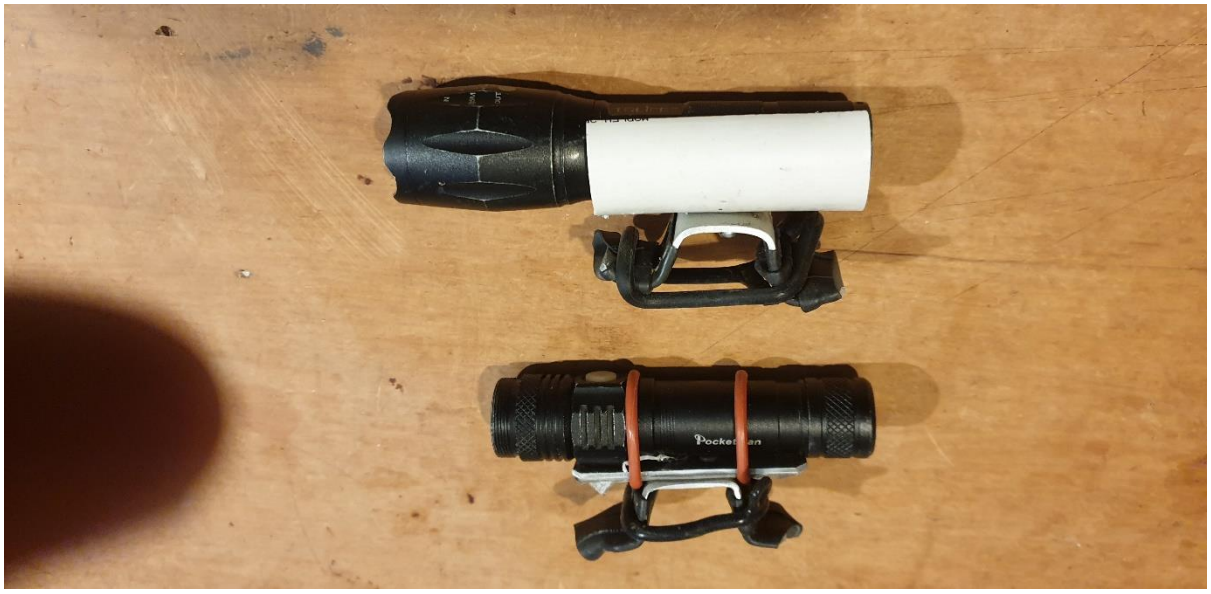


Bike lights

Batteries

The key to a bike light is the battery. Being able to replace the battery means you do not have to throw the light out in 3 years time when the battery capacity drops to 15 min light time, so buying lights with integrated USB chargable batteries is a risk. Rechargeable AA or AAA do not have much capacity. 3.7V 18650 lithium ion cells are very good for capacity. You can buy new cells but some are very poor quality and do not last. Sony, Samsung or Panasonic are reliable but some companies rebrand cheap ones with better quality labelling so beware. Importing them can often get stopped at customs. A more reliable source is Alan Liefting at ecotech services (377 0773, 139 Wordsworth Street, https://www.ecotechservices.co.nz) recycles electronics and often has new good quality 18650 batteries for a cheap price around $2 a cell.

Chargers

Lights can be bought with a single cell charger but a better idea is to get a 4 way charger that gives an indication of battery condition eg Nitecore UM4 UM2 USB QC Battery Charger
https://www.aliexpress.com/item/32966880184.html

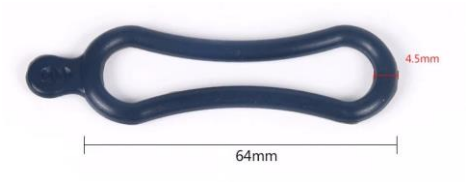
Battery packs A good battery pack means you can pack 4 cells together to run a more powerful light for longer, then remove them for charging. Trustfire make durable ones and you can use them as a power bank to charge phones also. You can also get 6 cell versions but 4 cells is lighter and usually lasts plenty long enough. https://www.aliexpress.com/item/1005003458250305.html. or https://www.aliexpress.com/item/1005005473656656.html_	
Single cell torches These are good for an hour of light and are bright enough to see ok, but not really well. Good for helmet use as they don't have a cord to tangle in things or require a pocket for the battery pack. Don't believe the brightness claims as they are usually grossly exaggerated. Search aliexpress.com "bike light 18650" some examples are: https://www.aliexpress.com/item/32787665340.html https://www.aliexpress.com/item/4000805122625.html Note a single cell does not have a low voltage cutout and they deteriorate quickly if they are run right down. It is up to you to change the battery before it dies completely, as soon as its output starts to drop. The clips that come with them are usually useless, so see note below about making a decent bracket with O-ring.	
Lights with 8.4 V battery packs Much brighter – lots around. I was not impressed with solar storm which grossly exaggerates its brightness claims. More than 2000 lumens is a waste of battery. 1000-1200 is adequate. Do not believe exaggerated claims of Lumens output. A single T6 LED is 700 to 900 Lumen output, a L2 LED up to 1200 Lumen. Check what LED is being used. T6, L2, XHP35 are good. XHP50 and 70 use lots of batteries and likely too bright. **https://www.aliexpress.com/item/1005004698464699.html** **https://www.aliexpress.com/item/1005001858757675.html** **https://www.aliexpress.com/item/1005004796430979.html**	

Clips

The lights seem good but the clip to attach them usually breaks easily. The best option is a bent piece of aluminium with flat bar riveted to top. 25mm plastic conduit cut down the length and moulded with a heat gun works well too for easy removal. Old road tyre inner tube around the edges protects the O-ring from cutting on the edge of the aluminium

An 0-Ring and some old handlebar grips under it hold it firmly to handle bars. 48mm oring for inch diameter handlebars and 64mm oring for 31mm handlebars. Old inner tube around the bent aluminium protects the o-ring from abrasion.

https://www.aliexpress.com/item/32751762287.html



For mounting torches to helmets a strip of aluminium and angle brackets with bungees tied to helmet is very quick and easy to use and copes with a variety of helmet designs. 4mm Bungee from Bunnings is good. I 3D print my own 4mm bungee clip as I cannot buy one. It works very well and is quick and flexible setup for a variety of helmet hole positions.