UV lights in primary schools

We occasionally get queries from primary schools asking for advice on buying ultraviolet (UV) light sources. The short answer is "Don't." Here's why.

There are a number of UV light sources that can be bought over the counter or online without difficulty, but that doesn't mean you should buy them. These include:

- "Handheld"1 lamps (see Figure 1). These are sometimes used to check bank notes.
- Sterilising wands (see Figure 2).
- UV torches and keyring lights.

The sun is also a source of UV light.

Just as there are sounds beyond the range of our hearing, there are forms of light that we cannot see. UV light is one of these. Like visible light, there is a range of UV colours, though their names are rather prosaic - UVA, UVB and UVC. The lamp in Figure 1, plus most UV torches and key-ring lights give out UVA. Sterilising wands give out UVC. Confusingly, so do some lamps that look identical to the one in Figure 1.

There are health hazards associated with UV light. You probably know some of them since it is the UV component of sunlight that causes sun burn and, in some cases, skin cancer.

Three parts of the body can be damaged by UV light.

There are safety limits set for skin and eye exposure to UV. The exposure depends on the power of the UV lamp, the type of UV (A, B or C), your distance from it and the time for which you are exposed. Somebody holding a switched-on lamp of the type shown in Figure 1 would very quickly exceed safe exposure limits. UVC lamps are only suitable for Advanced Higher students.

In primary schools, UV lamps could be used for only a small number of activities:

- **Spreading germs** - there is an activity whereby a pupil has a dye placed on their hand. The dye does not show up in ordinary light. The pupil shakes hand with a classmate, who shakes hands with someone else and so on. Everyone in the class has their hands examined under UVA light. The dye glows. The aim of the activity is to model the way germs can be spread.
- **Sun creams experiment** - beads which change colour under UV light are used to compare different sun creams.

Part of body	Damage	Comments
Lens of eye	Cataract	Lens of eye clouds over. Sometimes clears up, but can require an operation.
Cornea of eye	Photo keratitis	Painful "sand in the eye" feeling. Clears up in most cases.
Skin	Ranges from sunburn to skin cancer	Risk of harm is highest with UVC (fortunately, though the sun gives out UVC, none of it gets to the earth's surface).

Figure 1 - "Handheld" UV lamp.

Figure 2 - Sterilising wand.

The spreading germs experiment can be done successfully with glitter gel in which case a UV lamp is not required to show its spread.

The sun creams experiment can be carried out by simply nipping outside once it is all set up. Enough UV from the sun gets to the earth's surface even on a dull day to make the beads change colour.

At SSERC we always say that if there is a safer way of making an educational point that isn't prohibitively more expensive or tricky to set up, why wouldn't you do it that way? There are safer, simple alternatives to using UV lamps and torches. These don't require someone to know the difference between a UVA and UVC lamp and they don't require high levels of supervision to check whether or not a child's skin or eyes are too close to the lamp for longer than is safe. We do not feel that the use of UV lamps in primary schools is justified. <<

Reference

[1] "Handheld" is in quotes because even in secondary school, we would always design activities so that these lamps did not have to be held.