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HGS SLT

Eco-Schools, Energy Use

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Energy Usage in Harrogate Grammar School

While energy conservation at Harrogate Grammar School has certainly improved drastically in the past years, we have identified a number of issues with unnecessary energy usage, after conducting our initial energy audit. We intend to work with staff to combat these problems, and reduce the overall energy consumption of the school, with our primary aim being to achieve Eco-Schools “Green Flag” status by the end of the 2019/20 academic year. This is completed by improving the school’s performance in at least three distinct areas, with energy being one suggestion put forward by the organisation themselves. Furthermore, a reduction in energy usage will ultimately reduce outflow of money, which will in turn benefit all members of the school community.

INITIAL AUDIT AND FINDINGS

Energy Audit

On Wednesday 8th January, we conducted an energy audit, where we recorded information about the state of three appliances: ceiling lights; projectors and computers. The audit started at 15:30. This means that many members of staff had vacated their classrooms, as lessons had finished an hour earlier. This allowed for a more accurate reading of appliance usage after the working day and into the night. Therefore, the data that we collected was an indication

of these appliances' overnight state. We visited every classroom in the main school, but omitted the sixth-form block from our survey.

Data and Findings

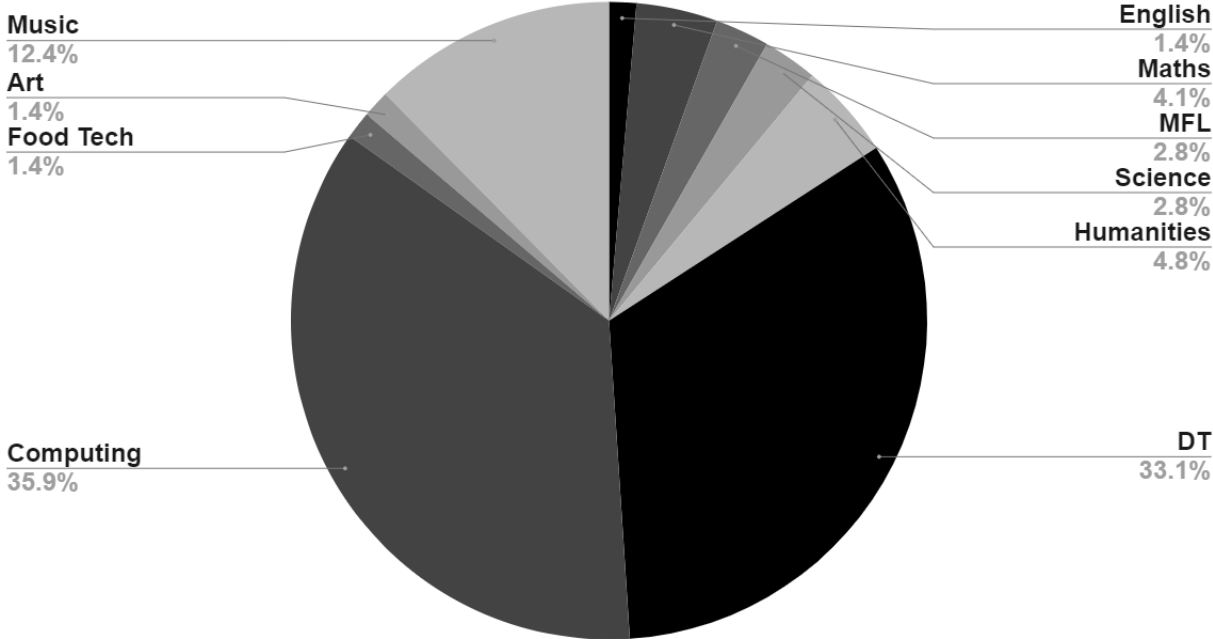


Fig. 1. Computers per Department. Self-Sourced.

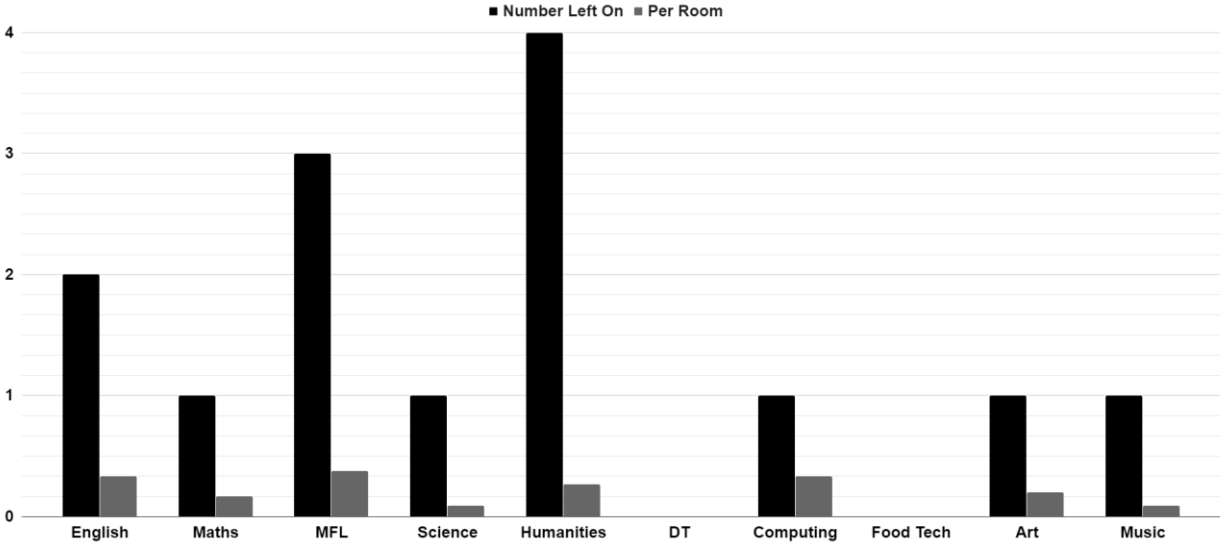


Fig. 2. Projectors by Room. Self-Sourced.

The most left-on device was undoubtedly the computer, with 145 examples of still-powered-on machines throughout the building. By comparison, lights were left on in 19 instances and projectors just 14 times. Looking at the most significant offenders by faculty, the outright largest portion of powered-on computers were found in the design block (the culmination of Fig. 1's Art, Computing and DT sections), which contributed a total of 70.4% of all active computers.

Projectors and lights were relatively evenly spread, with a slight bias towards humanities classrooms. However, this bias was mostly corrected when calculating the average number of appliances per room, as shown in Fig. 2.

MEETINGS WITH NON-TEACHING STAFF

Mr Ambler, Network Team

After school on Wednesday 29th January, we met with Mr Ambler to discuss solutions to the seemingly excessive power consumption of the school's desktop computers. Together, we came up with a number of potential solutions, many of which could be employed alongside one another.

One solution would be an upgrade to the computers' hardware, which would - in theory - reduce startup times. This would in turn mean that many members of staff would be much less likely to purposefully leave their computer switched on overnight, as turning it on the next morning would not take nearly as much time. Furthermore, this solution would improve overall power consumption of the machines, as newer, upgraded hardware draws far much less power for the same performance and speed.

Despite that possible solution, boot times cannot be improved beyond a certain point. Every time a computer in school is switched on, group policies must be applied.

However, another solution which would work best in tandem with the previous suggestion would be to automatically shutdown all computers at a set time. This would be particularly effective as, even if boot times are cut, changing the habits of over 100 members of staff is not an insignificant task. Therefore, many people are likely to still leave their computers turned on overnight. Automating the shutdown of computers is theoretically possible, as a school-wide startup is automated at 08:30 every morning.

SOLUTIONS

One slightly radical solution would be to replace or upgrade a large amount of computer hardware. Newer components are obviously faster, so would improve boot times, but the primary benefit would be the increased power efficiency. Some older systems can easily draw over 100 watts, whereas newer configurations only require half of that.

Clearly, this would be very expensive, for possibly not a great amount of gain. Some other solutions could be implemented, such as Windows Power Plans, which automatically lower the power draw of systems, in exchange for lowered performance.