

M502: THERMAL ENVIRONMENT

STUDENT EXERCISE 4 - ANSWERS

1. From the information supplied it is clear that in summer the majority of complaints arise in areas where there is no ventilation. Given that the internal temperature is 8-9°C above the external temperature and ventilation is limited, it is not surprising that such complaints arise. In winter complaints most probably arise as a result of draughts.
2. While ventilation of the rest of the store would be the obvious choice, the age of the building may make this exercise very costly.

What could be done is to investigate what causes the building to heat up so much during the day (what causes the heat load) and why it doesn't cool down at night in summer. In winter the control of draughts would reduce complaints but care needs to be exercised to ensure airflow movement isn't restricted in summer. The introduction of double entry doors may reduce draughts in winter and still give the option of open doors in summer if the building is too warm.

It is also clear that the first floor presents the major problems with the highest levels of thermal sensation being recorded (2.44 in summer and -1.45 in winter). In summer this is most probably due to the high heat load from lighting but in winter the level of discomfort is difficult to explain but may be due to the wide range in temperatures experienced between summer and winter.