

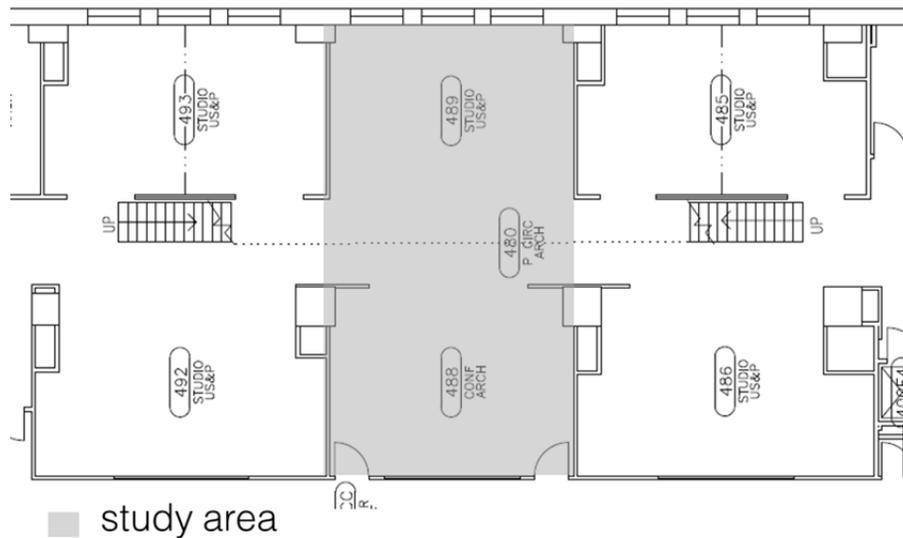
Assignment 2 – Daylit Area Study

Task 2.1: Development of Course Project (Group Assignment)

Discuss a possible course project with the other members of your group as well as with the instructor. Read the daylighting essays of the other members of your group and formulate a joined definition for your project. Submit this definition as a group assignment.

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Build a detailed Rhino model of the classroom (see below). Make sure to place different materials on different layers and use the techniques covered in class to estimate the reflectance and/or transmittance of all surfaces in your scene.



Task 2.3: Daylit Area Study (Individual Assignment)

A key architectural concept is to divide the floor plan of a building or space into a 'daylit' and a 'non-daylit' area. Within the daylit area indoor illuminances levels due to natural light should be adequate, useful and balanced for most of the year. In this exercise you are asked to follow your own intuition and divide the 'taped' area in the Classroom into a daylit and a non daylit area.

During your visit to the classroom space, you will be asked

- to mark the daylit area on a floor plan of the space that will be provided for you,
- to take a series of illuminance measurement and to,
- take an HRD image from a fixed viewpoint within the space

Chartered Institution of Building Services Engineers/National Physical Laboratory. Lighting Guide 11: Surface Reflectance and colour

Reflectance sample card

The reflectance sample card is intended to enable lighting designers and architects to make visual assessments of surface reflectance to the degree of accuracy appropriate for use in lighting design software or manual calculation routines.

Table of surface reflectance values

	Light source	A	B	C	D	E	F	G	H
		grey	brown	ochre	olive	red	blue	green	yellow
Row 1	Incandescent	10	14	25	18	25	15	13	39
	Fluorescent 840	10	13	25	18	23	16	15	38
	Daylight D65	10	13	23	17	19	17	16	36
Row 2	Incandescent	15	18	31	25	31	24	21	47
	Fluorescent 840	15	18	31	25	29	25	23	47
	Daylight D65	15	17	30	24	25	26	24	45
Row 3	Incandescent	24	27	40	33	40	35	34	56
	Fluorescent 840	24	27	39	33	38	35	35	56
	Daylight D65	24	26	38	33	35	37	36	54
Row 4	Incandescent	36	41	50	47	53	49	47	64
	Fluorescent 840	36	41	50	47	52	50	48	64
	Daylight D65	36	40	48	46	49	51	50	63
Row 5	Incandescent	55	58	64	61	65	63	62	73
	Fluorescent 840	54	58	64	61	64	63	62	73
	Daylight D65	55	58	63	61	63	64	64	72
Row 6	Incandescent	74	77	79	77	77	78	78	81
	Fluorescent 840	73	76	79	77	76	78	78	81
	Daylight D65	74	77	79	77	76	79	78	81

Procedure

- 1 Hold the card against the surface, at a comfortable viewing distance, taking care not to obstruct the light falling on the surface and ensuring that the card is uniformly illuminated with diffuse light.
- 2 Select the column which most closely resembles the colour of the surface. In situations where there is doubt over which column is closest in appearance, use the two (or more) which are most similar and take the average result. In addition, the grey column can be used with a surface of any colour.
- 3 Select the sample(s) within the chosen column(s) which appear to be closest in brightness to the surface (which can be viewed through the holes in the card). Read off the reflectance value(s) for the type of light source with which the surface is being illuminated. Where the brightness of the surface appears to lie between two adjacent samples in a colour column, the mean reflectance of the two samples may be used.
- 4 If necessary, take the mean of the reflectance values from the two (or more) colour columns chosen.

Note: Although every care has been taken to select stable printing inks for the reflectance sample card, the patches are likely to change in colour and/or reflectance if they are exposed to light for long periods. Users are advised to store the card in the protective sleeve provided when it is not in use. This will also help to keep the card clean.

In the event that the reflectance sample card becomes dirty or damaged, a replacement copy can be purchased from CIBSE Publications.

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4.430 Daylighting
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