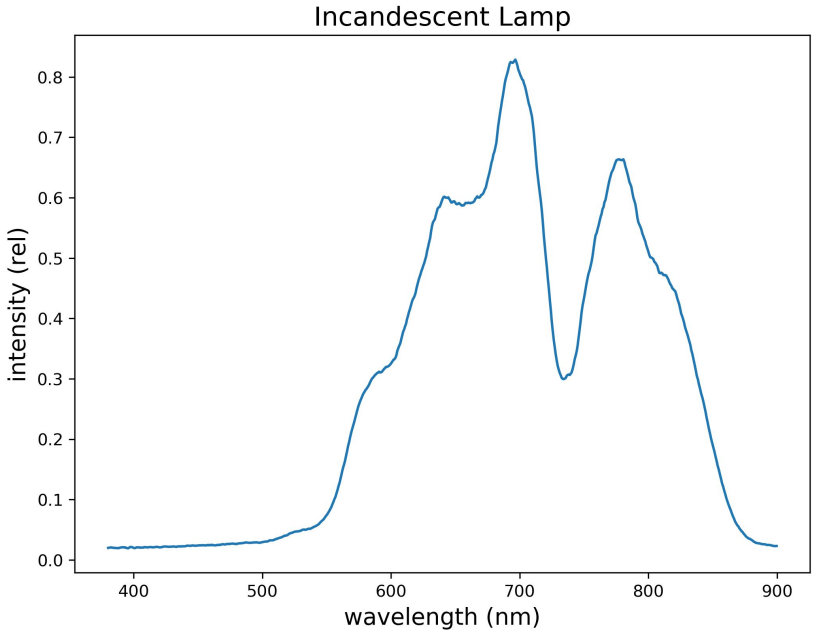
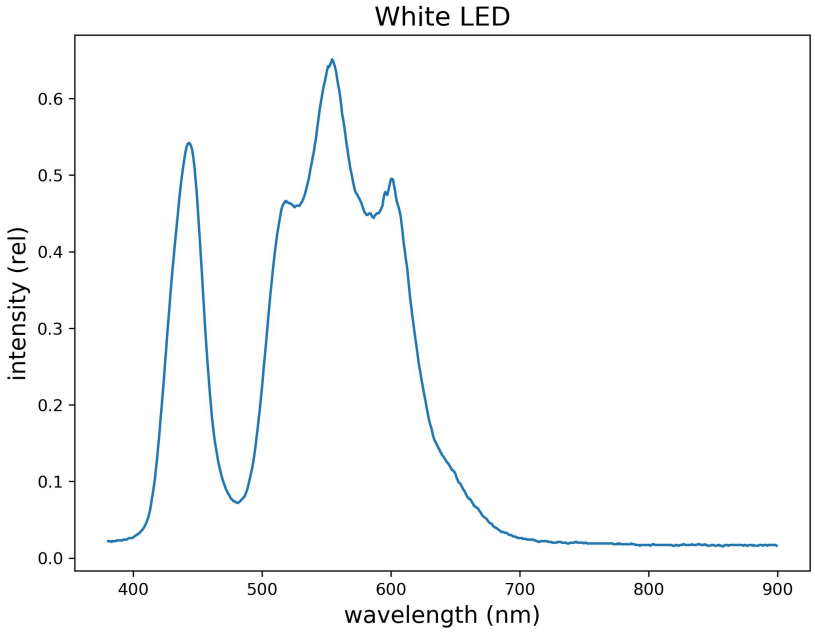
Activity 8 - CIE Lab Transformation

de Castro, Crizzia Mielle | 2015-08076

Emission Spectra of Light Sources





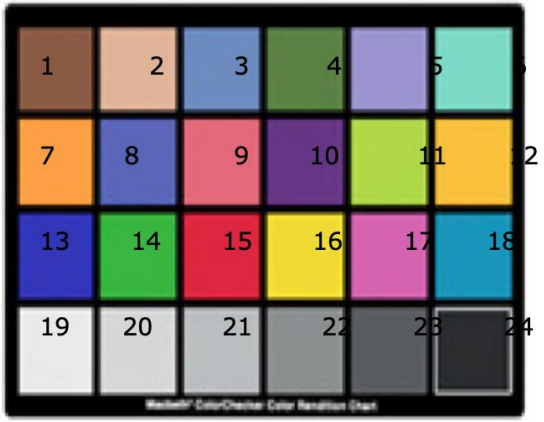
The two light sources I used were an incandescent lamp and a white LED. I obtained the data from our previous activities: activity 2 and 4, respectively.

Comparison of CIE 76DE

patch	DE
1	11.32
2	12.08
3	8.46
4	10.07
5	3.45
6	20.88
7	26.79
8	11.89

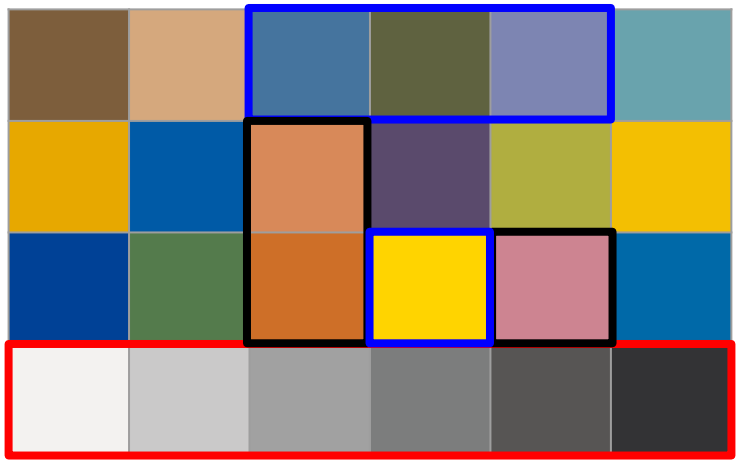
patch	DE
9	33.10
10	12.20
11	14.92
12	15.05
13	20.40
14	22.94
15	40.91
16	7.78

patch	DE
17	33.22
18	23.64
19	0.692
20	0.609
21	0.514
22	0.424
23	0.401
24	0.259

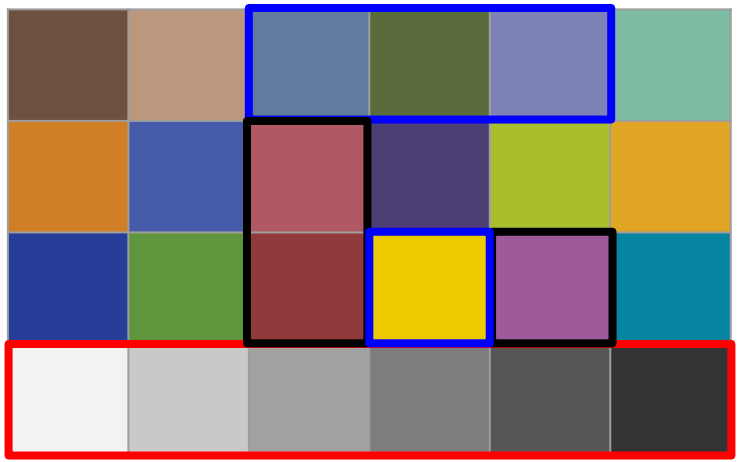


Delta E	Perception
<= 1.0	Not perceptible by human eyes.
1 - 2	Perceptible through close observation.
2 - 10	Perceptible at a glance.
11 - 49	Colors are more similar than opposite
100	Colors are exact opposite

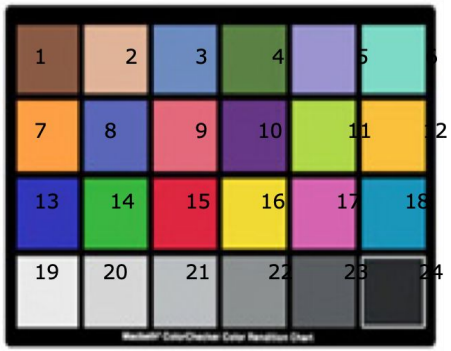
Comparison of CIE 76DE



incandescent lamp



white LED



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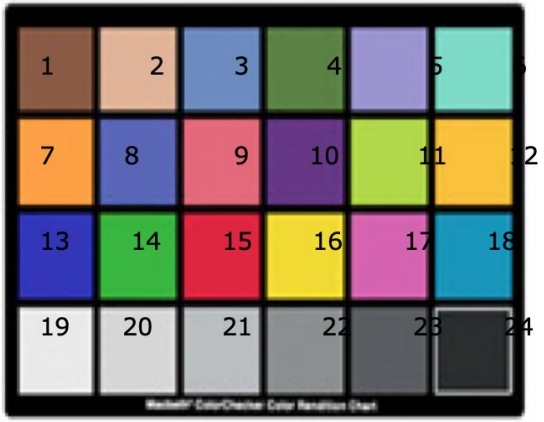
Comparison of CIE 76DE Chroma and Hue

patch	DE
1	10.0
2	11.80
3	7.37
4	8.85
5	3.06
6	9.69
7	20.26
8	4.35

patch	DE
9	18.29
10	11.73
11	12.85
12	13.68
13	4.44
14	22.38
15	30.0
16	5.75

patch	DE
17	19.66
18	18.03
19	2.95
20	0.880
21	0.945
22	1.05
23	0.507
24	0.248



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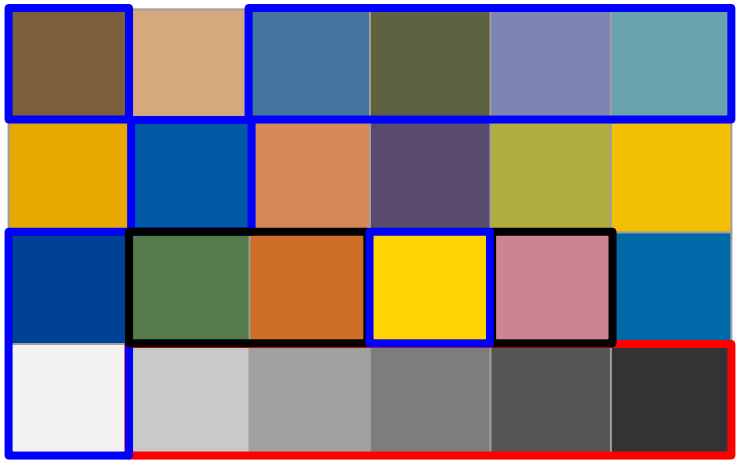
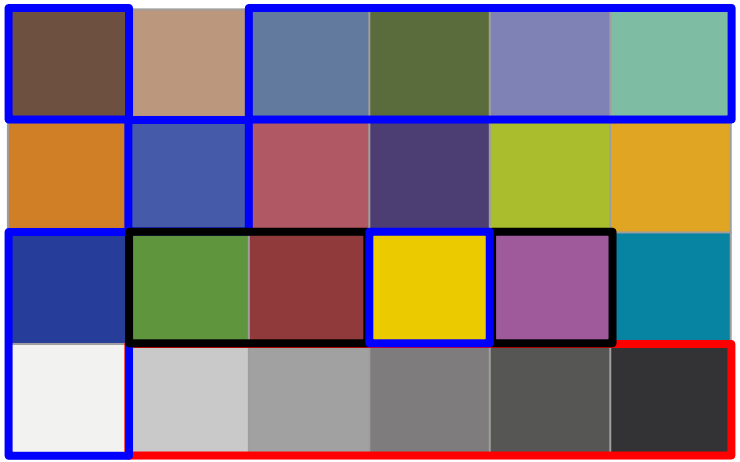
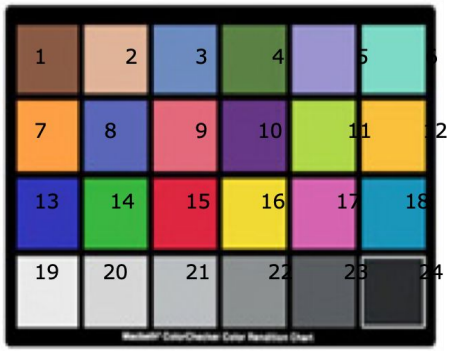
Comparison of CIE 76DE Chroma and Hue



incandescent lamp



white LED



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Discussion

The patches with DE less than 2.3 are the white-black patches at the bottom of the Macbeth color chart. Based on the perception table[1], most of the color patches are easily perceptible under the two light sources. It becomes a little more difficult to perceive yellow and color patches at the upper right of the chart.

This becomes more evident in the RGB rendering of the color patches under different light sources. Their hexadecimal values were obtained using an online Lab-to-hex converter[2].

Based on subjective perception, the 76DE generally seems to do a more accurate determinant. However, there are certain instances where the Chroma and Hue work better: patches 1 and 13.

References

1. Schuessler, Z. (2016). Delta 101. Retrieved from http://zschuessler.github.io/DeltaE/learn/
2. https://www.nixsensor.com/free-color-converter/