Solutions for Spectral Types Project

Questions 1-4. Answers will vary depending on what classification system students used.

Question 5. There are the three hydrogen lines. The calcium H and K lines are strong as well. There are weaker lines of a couple of metals.

Question 6. This star is a type F star.

Exercise 2.

Plate	Fiber	Spectral Type
266/51630	483	A
267/51608	206	K
266/51630	394	G
268/51633	290	M
266/51630	344	G
266/51630	49	F
266/51630	82	F
281/51614	398	A
268/51633	66	G
268/51633	206	K

Exercises 3-4. Answers will vary depending on which stars students chose. Types F, G, and M are the most common spectral types in the SDSS database, while types O and B are the rarest.

Question 7. This question has many possible answers. Type O stars form less frequently than other types of stars. Type O stars have relatively short lifespans. A type O star will die more quickly than a star of a cooler spectral type, so at any time, there are fewer type O stars in our galaxy. Type O stars are also more common in the galactic plane, while SDSS looks outside the galactic plane, since we are more interested in seeing galaxies and quasars.

Question 8. Most students probably will not find any unusual stars. Some may find a carbon star or other unusual star in the database that they can't classify. Or, they may find a double star that appears to have two peaks in the spectrum. Students should make note of any unusual stars they find.

Exercise 5. This star has a strong sodium line, lots of titanium oxide lines, and lines for a few other metals. The star has some very strong absorption lines in the infrared.

Exercise 6. This star has even stronger sodium and more titanium oxide lines, suggesting that it is even cooler than M type stars. It is likely a class L dwarf.

Exercise 7.

Fiber 185: Sodium, titanium oxide (missing the strong infrared absorption lines of a carbon star) and a strong, unidentified line at 5600 Angstroms.

Fiber 220: Very cool star...no readily identifiable lines, but there are a lot of infrared absorption lines. Probably an L type dwarf.

Fiber 242: Very hot star...probably a B giant. Some hydrogen lines, but not as strong. No significant helium lines.