

**ESCI 241 – Meteorology**  
**Selected Answers to Exercises for Lesson 3**

1. Blue light has a wavelength of  $0.48\mu\text{m}$ .
  - a. What is its frequency? **Answer:**  $6.25\times 10^{14}\text{ s}^{-1}$
  - b. What is its angular frequency? **Answer:**  $3.93\times 10^{15}\text{ s}^{-1}$
  - c. What is its wave number? **Answer:**  $2.1\ \mu\text{m}^{-1}$
  
2. The Sun radiates at a temperature of 6000K.
  - a. Use the Stefan-Boltzmann law to find out how much energy per square meter it radiates? **Answer:**  $7.35\times 10^7\text{ W/m}^2$
  
  - b. Use Wien's Law to find out at what wavelength it emits its peak radiation? What part of the spectrum is this in? **Answer:**  $0.48\mu\text{m}$
  
3. The Earth's surface radiates at a temperature of 288K.
  - a. Use the Stefan-Boltzmann law to find out how much energy per square meter it radiates? **Answer:**  $390\text{ W/m}^2$
  
  - b. Use Wien's Law to find out at what wavelength it emits its peak radiation? What part of the spectrum is this in? **Answer:**  $10\mu\text{m}$