# Chapter 8 Summary

## 8.1 Exploring Space

### Key Concepts

- There are two basic types of optical telescopes. Refracting telescopes collect light using a lens, and reflecting telescopes collect light using mirrors.
- There are also telescopes that detect non-visible radiation.
- Alternatives to human exploration of space are telescopes, planetary orbiters, landers, and satellites.
- There are hazards, risks, benefits, and ethical issues related to exploring space and developing space technology.
- The Canadian government, Canadian companies, and individual Canadians have contributed to the exploration of space in many different ways.

## 8.2 Exploring the Sun

### Key Concepts

- The solar nebula theory says that the Sun and the solar system formed from a spinning, contracting disk of gas and dust particles.
- Evidence supporting the solar nebula theory consists of heavily cratered objects, most planets rotating in about the same direction, most planets revolving in the same direction and in about the same plane, and the existence of other planets around other stars.
- The Sun's energy source is hydrogen. It converts matter into energy through nuclear fusion.
- Sunspots can produce solar flares, which send gigantic beams of charged particles into space.
- Charged particles from the Sun that enter Earth's atmosphere produce auroras, but the charged particles can also damage electronic equipment, cause large-scale power blackouts, and pose a danger to astronauts.
- Energy absorbed and emitted by Earth's surface heats Earth and keeps it warm.

## 8.3 Exploring Other Stars

### Key Concepts

- A star's apparent brightness depends on its luminosity and distance from Earth.
- Hertzsprung and Russell independently discovered that each type of star has specific properties. They organized their findings into what is now called a Hertzsprung-Russell (H-R) diagram.
- The main sequence is a narrow band of stars on the H-R diagram that runs diagonally from the upper left (bright, hot stars) to the lower right (dim, cool stars). About 90 percent of stars are on the main sequence, including the Sun.
- A star's position on the main sequence is determined by its initial mass.
- A star will become a white dwarf, a neutron star, or a black hole, depending on its initial mass.
- Canadian researchers contribute to our understanding of space.