

Reproduction in conifers is diverse. The time for a conifer life cycle varies from species to species. Not all conifers produce cones. For example, yews produce ovules covered by fleshy tissue. Juniper seed cones look like berries. Regardless of differences, conifer reproduction ensures the survival of this plant division.

Figure 23.6 The sporophyte generation is dominant in the life of a conifer.

Concepts in Motion

Interactive Figure To see an animation of a conifer's life cycle, visit biologygmh.com.

Section 23.1 Assessment

Section Summary

- ▶ Vegetative reproduction produces new plants without sexual reproduction.
- ▶ The moss sporophyte depends on the gametophyte.
- ▶ A fern sporophyte can live independently of the gametophyte.
- ▶ Conifer gametophytes develop within sporophyte tissues.

Understand Main Ideas









1. **MAIN Idea** Name the stages of alternation of generations. Specify whether the stage is diploid or haploid.
2. **List** advantages of vegetative reproduction.
3. **Explain** how the fern sporophyte is dependent upon the gametophyte.
4. **Compare and contrast** the life cycles of mosses and conifers.

Think Scientifically

5. **Determine** how the distribution of conifers might be affected if water was needed for reproduction.
6. **MATH in Biology** Calculate the number of spores that could be released in three square meters if the density of moss plants is 100 plants per square meter and the average number of spores released per plant is 10,000.



Self-Check Quiz biologygmh.com

Short-day plant		Long-day plant	
			
Day-neutral plant		Intermediate-day plant	
			

Intermediate-day photoperiodism Many plants that are native to tropical regions are **intermediate-day plants**. This means that they will flower as long as the number of hours of darkness is neither too great nor too few. Sugarcane and some grasses are examples of intermediate-day plants.

Day-neutral photoperiodism Some plants will flower regardless of the number of hours of darkness as long as they receive enough light for photosynthesis that supports growth. A plant that flowers over a range in the number of hours of darkness is a **day-neutral plant**. Buckwheat, corn, cotton, tomatoes, and roses are examples of day-neutral plants.

■ **Figure 23.11** A plant's critical period determines when the plant will flower.

Section 23.2 Assessment

Section Summary

- ▶ A typical flower has sepals, petals, stamens, and one or more pistils.
- ▶ Flower form differs from species to species.
- ▶ Some flower modifications distinguish monocots from eudicots.
- ▶ Modifications make flowers more attractive to pollinators.
- ▶ Photoperiodism can influence when a plant flowers.

Understand Main Ideas

1. **MAIN Idea** Compare and contrast the function of each of the four organs of a typical flower.
2. **Describe** flower traits of a typical monocot flower and a typical eudicot or dicot flower.
3. **Compare and contrast** complete and incomplete flowers.
4. **Predict** which type of photoperiodism should produce blooms at this time of the year.

Think Scientifically

5. *Design an experiment* to develop flowers on long-day plants during the winter.
6. *Assess* the importance of pollinators for imperfect flowers.
7. **WRITING in Biology** Write a description, from the point of view of a pollinator, of a visit to a flower.

