

## Euglenophytes

Members of the phylum Euglenophyta (yoo-GLĒE-nuh-fyt-uh), or euglenophytes, are closely related to the animal-like flagellates. 🇨🇪 **Euglenophytes are plantlike protists that have two flagella but no cell wall.** Although euglenophytes have chloroplasts, in most other ways they are like zooflagellates.

The phylum takes its name from the genus *Euglena*.

Euglenas are found in ponds and lakes throughout the world. A typical euglena, such as the one shown in **Figure 20–10**, is about 50 micrometers in length. Euglenas are excellent swimmers. Two flagella emerge from a gullet at one end of the cell, and the longer of these two flagella spins in a pattern that pulls the organism rapidly through the water. Near the gullet end of the cell is a cluster of reddish pigment known as the **eyespot**, which helps the organism find sunlight to power photosynthesis. If sunlight is not available, euglenas can also live as heterotrophs, absorbing the nutrients available in decayed organic material. Euglenas store carbohydrates in small storage bodies.

Euglenas do not have cell walls, but they do have an intricate cell membrane called a **pellicle**. The pellicle is folded into ribbonlike ridges, each ridge supported by microtubules. The pellicle is tough and flexible, letting euglenas crawl through mud when there is not enough water for them to swim. Euglenas reproduce asexually by binary fission.

## Chrysophytes

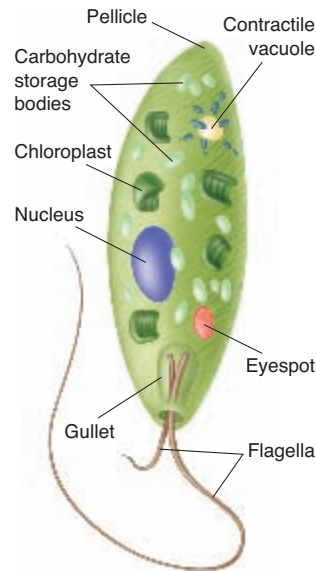
The phylum Chrysophyta (KRIS-oh-fyt-uh) includes the yellow-green algae and the golden-brown algae. The chloroplasts of these organisms contain bright yellow pigments that give the phylum its name. Chrysophyta means “golden plants.” 🇨🇪 **Members of the phylum Chrysophyta are a diverse group of plantlike protists that have gold-colored chloroplasts.**

The cell walls of some chrysophytes contain the carbohydrate pectin rather than cellulose, and others contain both pectin and cellulose. Chrysophytes generally store food in the form of oil rather than starch. They reproduce both asexually and sexually. Most are solitary, but some form threadlike colonies.

## Diatoms

Members of the phylum Bacillariophyta (buh-sil-LAHR-ee-oh-fyt-uh), or diatoms, are among the most abundant and beautiful organisms on Earth. 🇨🇪 **Diatoms produce thin, delicate cell walls rich in silicon (Si)—the main component of glass.** These walls are shaped like the two sides of a petri dish or flat pillbox, with one side fitted snugly into the other. The cell walls have fine lines and patterns that almost seem to be etched into their glasslike brilliance, as shown in **Figure 20–11**.

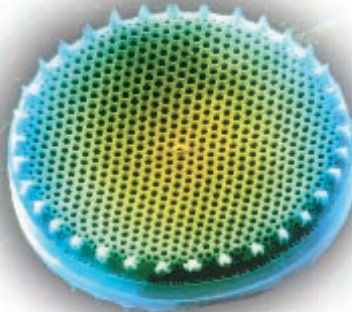
**CHECKPOINT** How are diatoms and glass alike?



▲ **Figure 20–10** 🇨🇪 Euglenophytes are plantlike protists that have two flagella but no cell wall. The green structures inside the euglena shown are chloroplasts, which allow the organism to carry on photosynthesis. Like paramecia, euglenas expel excess water through a contractile vacuole.

▼ **Figure 20–11** 🇨🇪 Tiny jewel-like diatoms such as this centric diatom have cell walls rich in silicon.

(magnification: 2200×)



## Section 20–3

## Euglenophytes

### Build Science Skills

**Observing** Provide students with a prepared slide of a euglena. Ask them to use a microscope to observe the slide and make a labeled drawing of what they see. Point out that students should use the labeled drawing in Figure 20–10 to help them find the structures of a euglena. L2 L3

## Chrysophytes

### Make Connections

**Chemistry** Ask students: **What is unusual about the way chrysophytes store food?** (*They generally store food in the form of oils rather than starch.*) **How do the energy-storing abilities of oils compare to those of starch?** (*Oils, which are lipids, can store more than twice as much energy per gram as starches, which are carbohydrates.*) L2

## Diatoms

### Build Science Skills

**Observing** Ask students how they think they could collect diatoms to observe. Suggest that they look for brownish-yellow, crusty coatings on rocks, twigs, or shells in shallow ocean, lake, or pond water. Have students follow these steps to collect and observe diatoms:

1. Place a coated rock, twig, or shell and some of the water in a jar.
2. In the lab, drain off most of the water, and then float a clean glass coverslip in the remaining water. If left for 1–2 days, diatoms will attach to the coverslip.
3. Scrape the coverslip with a scalpel, spread the material on a slide, and observe with a microscope.

Have students make drawings and try to identify the diatoms they observe.

L2 L3

### Answers to . . .

**CHECKPOINT** The cell walls of diatoms are rich in silicon, which is the main component of glass.

**ESL**

## SUPPORT FOR ENGLISH LANGUAGE LEARNERS

### Vocabulary: Science Glossary

**Beginning** Write the following Vocabulary terms on the board: *eyespot* and *pellicle*. Say each term aloud, and have students repeat it after you. Help students identify these structures in Figure 20–10. Then, distribute unlabeled copies of Figure 20–10. Have students write the two terms as labels. Finally, students can write definitions of each term in their science glossary and paste their labeled copies of the illustration next to the definition. L1

**Intermediate** Students should complete the beginning-level activity. Working with an English-proficient student, they can extend the activity by writing two complete sentences, one using each of the Vocabulary terms. Then, to give students an opportunity to practice pronunciation, ask for individuals to volunteer to read their sentences aloud. L2