Chapter 6-11: Simple Algae

The Kingdom Protista is made up of protozoa, slime molds, and simple algae. Many scientists believe that complex plants evolved from simple algae. This algae is all eukaryotic, but it may be unicellular (single-celled) or multicellular. In this plate, we will describe the various types of simple algae.

Looking over the plate, you will notice that we show examples of simple algae, along with the life cycle of one alga.

Alga is the common name for a large number of chlorophyll-containing simple organisms; they are photosynthetic, but have no roots, stems, or leaves. Most algae live in the ocean, but there are many freshwater forms. Some species are unicellular, others appear as colonies of cells, and some are truly multicellular, but with little differentiation of cells.

One group of simple algae is the pyrrhophytes. They are unicellular, have photosynthetic pigments, and are propelled by movement of their flagella. The example we show here is the **dinoflagellate (A)**. Through photosynthesis, dinoflagellates and other pyrrhophytes synthesize energy-rich carbohydrates. Dinoflagellates move by means of **flagella (B)** and are covered by armor-like plates.

Another simple alga is the **diatom (C)**. A light color should be used to color the diatom, in order to preserve its details. Diatoms are chrysophytes, and have walls made up of silicon dioxide, so they appear glassy. As photosynthetic organisms, diatoms are among the most important producers of carbohydrates in the oceans, and are at the base of many food chains.

We have introduced the simple algae, and will now move to larger forms that can be seen with the naked eye. Continue your reading below, and color the organisms.

The alga ***Chondras* (D)** is a type of red alga, also called rhodophytes. Red algae contain red pigments as well as the usual blue-green and green ones, and all but a few are aquatic; most are marine forms, and they comprise a large portion of the sea weeds. They are true multicellular organisms, and some red algae (kelps) grow to be fifty meters in length. The thickening agent, agar, is produced from red algae.

The brown algae are known as phaeophytes. They have characteristic brown pigments in addition to the usual chlorophyll pigments. One example of a brown alga is ***Laminaria* (E)**, which is an ocean kelp, and another is ***Fucus* (F)**, the common rockweed found near the beach. Fucus has **air bladders (G)** that enable it to float.

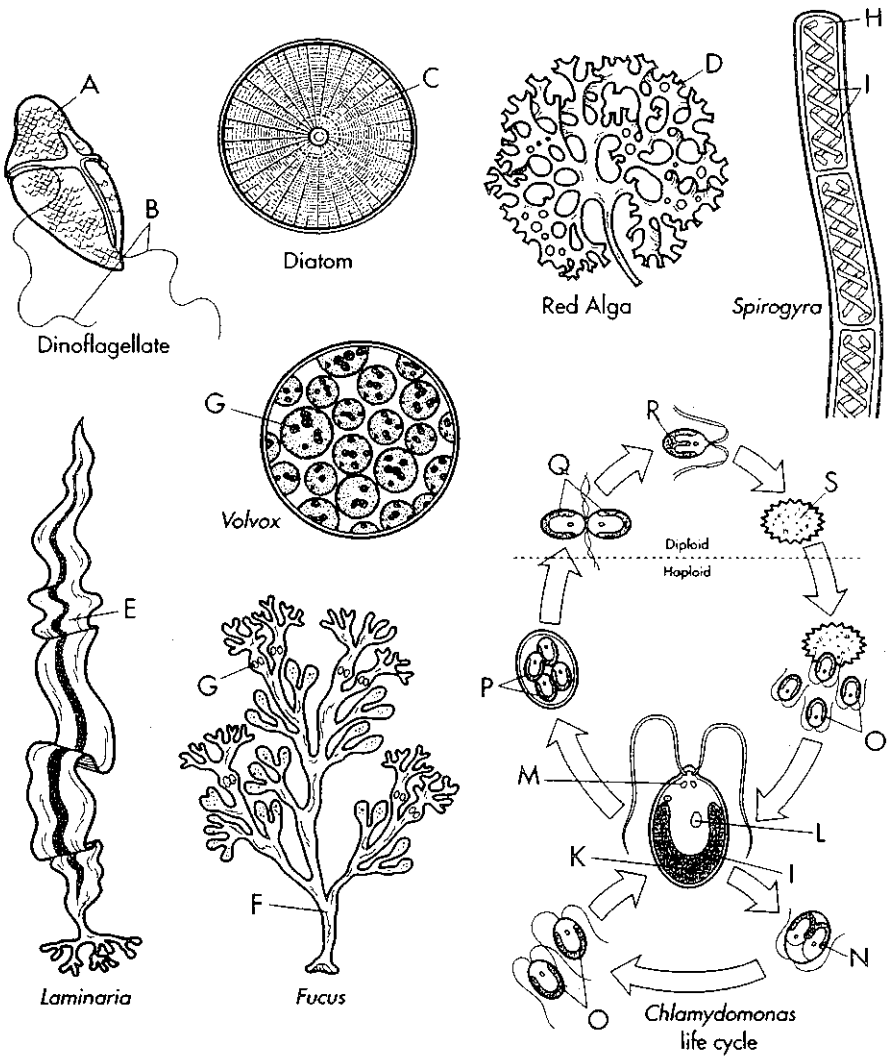
A final group of simple algae is the green algae, also called chlorophytes. They exist mostly in freshwater forms; for example, the colonial organism *Volvox* is a chlorophyte. Another green alga is ***Spirogyra* (H)**, in which the **chloroplasts (I)** exist in a spiral formation through the cells of the filament.

In the last portion of the plate, we will look at a unicellular green alga and its life cycle. Continue your coloring as you read the paragraphs below.

The life cycle of simple algae is illustrated here by the unicellular green alga *Chlamydomonas*. In our diagram, this organism has a prominent chloroplast (I) and **nucleus (K)**. The cell also contains a **starch granule (L)** and an **eyespot (M)** where photosensitive cells conjugate.

Chlamydomonas can reproduce asexually; through mitosis, this organism produces a number of haploid zoospores. They are represented by the **haploid zoospore (N)** in the diagram. Soon a number of **zoospores (O)** form and each develops into a mature *Chlamydomonas* cell.

In the sexual process of *Chlamydomonas'* reproduction, the cell first forms a number of **developing gametes (P)**. (Gametes are haploid organisms.) The **gametes fuse (Q)** at the beginning of the diploid stage so that there are two sets of chromosomes per cell: at this point the cell is a zygote. The zygote forms a **zygospore (R)**, in which meiosis takes place. Emerging from the **meiotic zygospore (S)** are a number of zoospores (O), each of which is haploid. The zoospores develop into new *Chlamydomonas* cells. In the life cycle of *Chlamydomonas*, both haploid and diploid generations exist. This process is called alternation of generations, and is common in complex plants.



6.11 Simple Algae

a. What are thought to have evolved from algae?
b. Where are algae found?
c. An example of pyrrophyta that move by flagella & are covered with armor-like plates:
d. An example of chrysophyta which are the base of many food chains:
e. Red algae (rhodophyta) that can grow fifty meters in length:
f. Thickening agent produced from red algae:
g. Brown alagae such as *Laminaria* & *Fucus* are know as this:
h. *Fucus* has these that enable it to float:
i. Green algae are called:
j. List three examples of green algae:

Simple Algae

○ Dinoflagellate ..... A	○ Air Bladders ..... G	○ Haploid Zoospore ..... N
○ Flagella ..... B	○ *Spirogyra* ..... H	○ Zoospores ..... O
○ Diatom C	○ Chloroplast I	○ Developing Gametes .... P
○ *Chondras* ..... D	○ Nucleus ..... K	○ Gametes Fusing ..... Q
○ *Laminaria* ..... E	○ Starch Granule L	○ Zygospore ..... R
○ *Fucus* ..... F	○ Eyespot ..... M	○ Meiotic Zygospore ..... S