

Background Information

Kingdom Protista includes algal protists, protozoans, and fungal protists. Protists are often thought of as simple organisms, but a closer examination reveals that they possess a variety of specialized structures. Protists are eukaryotic, which means they have a nucleus enclosed in a membrane. Protists also possess other organelles that perform different functions. Although most protists are one celled organisms, a few are multicellular. Protists are usually found in damp or watery environments.

In this investigation, you will use an dichotomous key to identify some of the common protists used in high school labs.

Problem

How can you identify some common microscopic organisms?

Materials (per group)

- | | |
|------------------|--------------------------------|
| Microscope | Mixture of common protists |
| Slide | Cover slip |
| Medicine dropper | Identification keys (optional) |

Procedure

1. Prepare a wet mount slide to observe various protists. Use the dichotomous key in this activity to identify as many protists as possible in the allotted time span.
2. As you identify a protist, record its name and phylum in the table below.

Table of Protists to Identify

	Name of Protist	Phylum
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

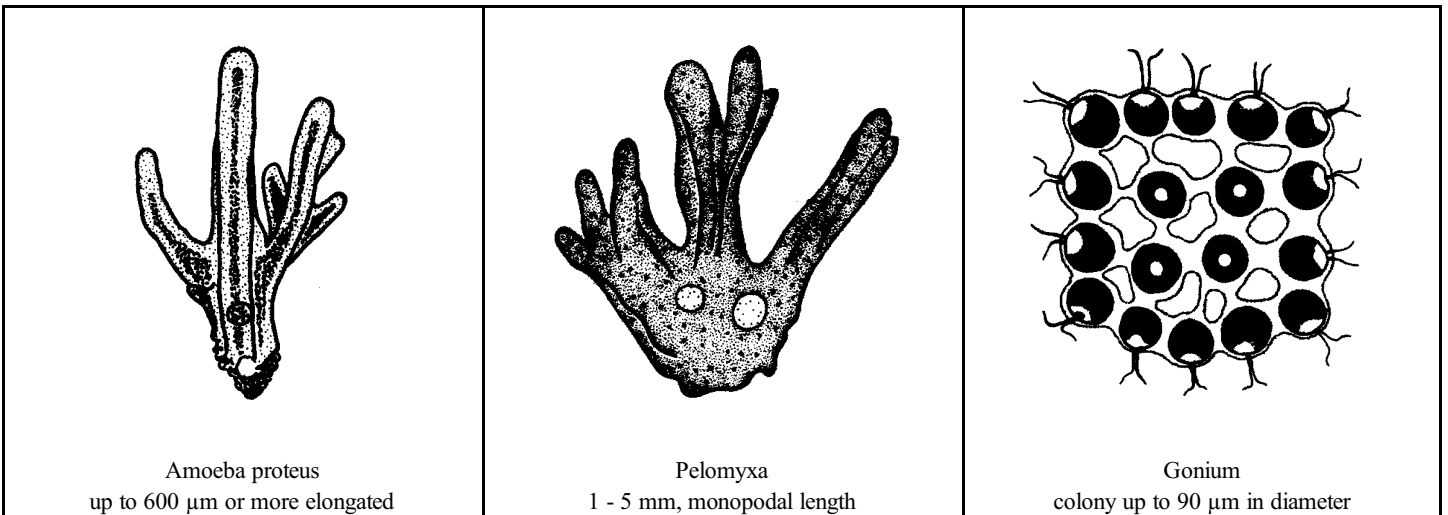
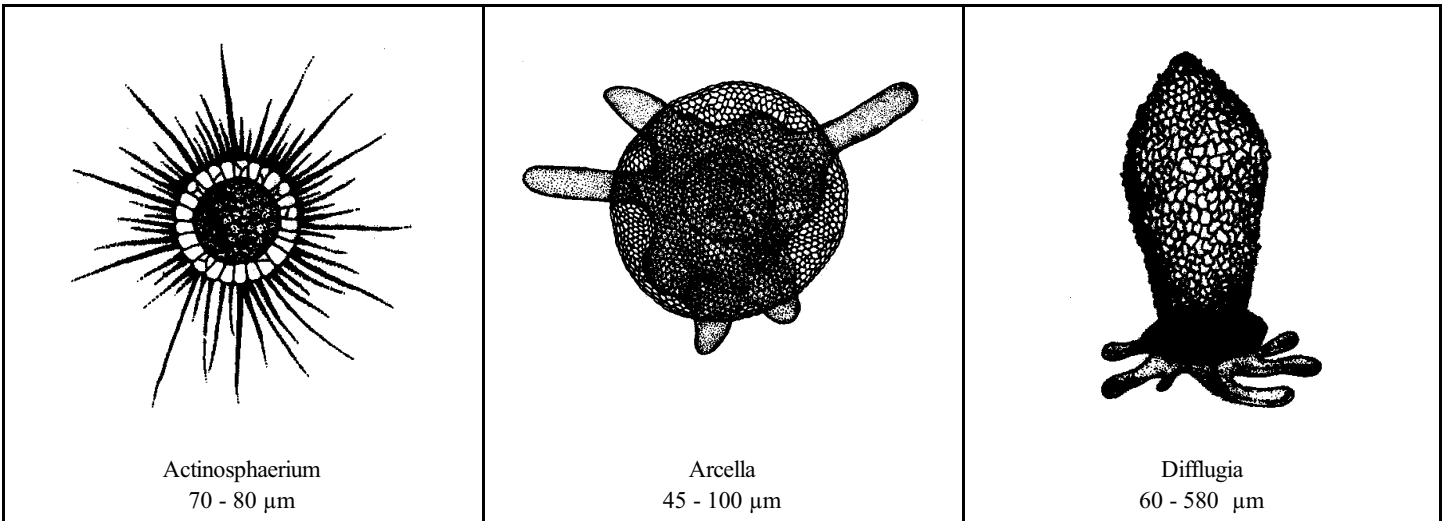
Key to Identify Some Common Protists

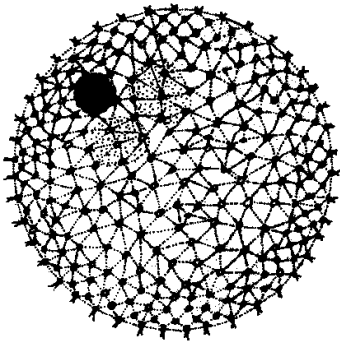
1a.	White or colorless	2a
1b.	Colored	8a
2a.	Slow creeping or floats without apparent motion	3a
2b.	Exhibits other motion	7a
3a.	Spherically shaped with radiating "spines"	Actinosphaerium
3b.	Not spherical in shape	4a
4a.	Shape remains constant	5a
4b.	Shape constantly changes	6a
5a.	Possesses test or shell which is flattened; without embedded or attached material; pale to brown in color	Arcella
5b.	Possesses test or shell which is dome shaped; with attached particles, usually of sand	Diffugia
6a.	Small, creeps using pseudopodia (false feet); single disc-shaped nucleus	Amoeba
6b.	Large, creeps using pseudopodia; many (100's) of small nuclei	Pelomyxa
7a.	Cell has hair-like structures (cilia)	16a
7b.	Cell's organ of locomotion is long whip-like flagella (no cilia)	9a
8a.	Green color	9a
8b.	Color not green	25a
9a.	Colony of many cells	11a
9b.	Single, motile cells	10a
10a.	One observed locomotor flagella	15a
10b.	Two observed locomotor flagella	14a
11a.	Colony flat, disc-shaped, usually containing 16 cells	Gonium
11b.	Colony spherical in shape	12a

12a.	Colony contains-32 cells or less	13a
12b.	Colony contains more than 32 cells - hundreds	Volvox
13a.	Colony contains 32 cells	Eudorina
13b.	Colony contains 16 cells	Pandorina
14a.	Cell elongate with narrowed posterior	Chilomonas
14b.	Cell oval-shaped	Chlamydomonas
15a.	Cell elongate, green in color	Euglena
15b.	Cell elongate, colorless, with a broad, rounded or truncate posterior during locomotion; highly plastic when stationary, often appears to vibrate when in motion	Peranema
16a.	Body entirely covered with cilia	20a
16b.	Body has specialized groups of cilia, or cilia in specific areas	17a
17a.	Cell on stalk; stalk attached to debris	18a
17b.	Cell not on stalk	19a
18a.	Stalk not, branched; cells contract (stalk appears to contract like a spring)	Vorticella
18b.	Stalk branched; cells contract independently (stalk appears to contract like a spring)	Carchesium
18c.	Stalk branched; cells do not contract	Epistylis
19a.	Cell oval-shaped with distinct point-like projections termed cirri (fused cilia); travels by "walking" using cirri	Euplotes
19b.	Cell oval-shaped with two distinct ciliary bands, one anterior and one in the middle of the body; swims with spiral motion	Didinium
20a.	Body trumpet-shaped or elongated	21a
20b.	Body oval-shaped	24a
21a.	Body trumpet-shaped; usually attached to substrate	Stentor
21b.	Body elongated; never attached to substrate	22a
22a.	Body elongated with distinguishable trunk	Dileptus
22b.	Body elongated without trunk	23a

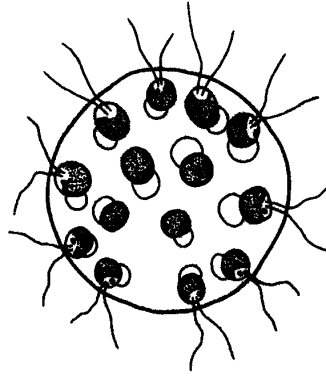
- 23a. Large cell with elongated, flattened, body with blunt ends; contracts to $\frac{1}{4}$ of its body length when stimulated Spirostomum
- 23b. Small cell with elongated body, "cigar-shaped," with rounded ends; swims rapidly in a corkscrew fashion Paramecium
- 24a. Small body, oval shaped, with small. mouth; fast swimmer Colpidium
- 24b. Extremely large body (visible with naked eye), with large, wide mouth Bursaria
- 25a. Pink or rose-colored (ciliate) Blepharisma
- 25b. Dark bluish-green (ciliate) Stentor

Pictorial Display of Some Common Protists

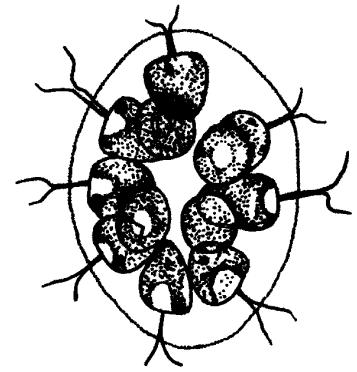




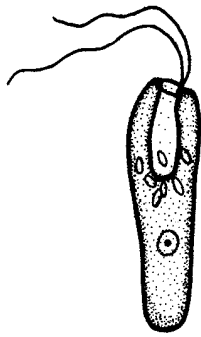
Volvox
colony from 350 - 500 μm in diameter



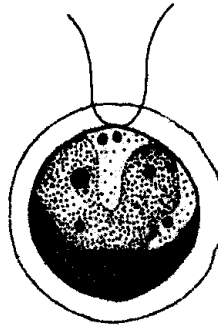
Eudorina
10 - 24 μm in diameter



Pandorina
colony from 20 - 250 μm in diameter



Chilomonas
20 - 40 μm



Chlamydomonas
5 - 12 μm in length



Euglena
35 - 55 μm in length



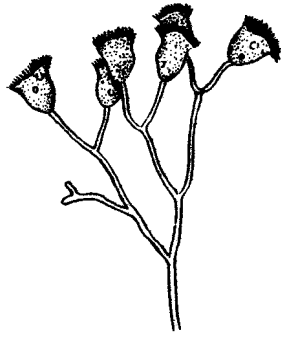
Peranema
20 - 70 μm in length



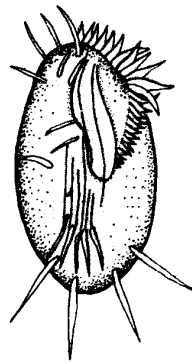
Vorticella
50 - 145 μm in length



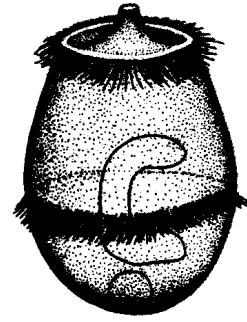
Carchesium
cells 100 - 250 μm , colony up to 3 mm long



Epistylis
cells 50 - 100 μm , colony up to 3 mm long



Euplotes
100 - 200 μm in length



Didinium
80 - 200 μm in length



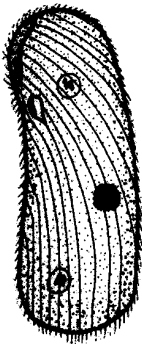
Stentor
1 - 2 mm extended



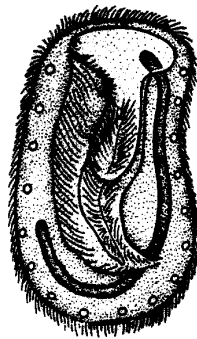
Dileptus
250 - 400 μm in length



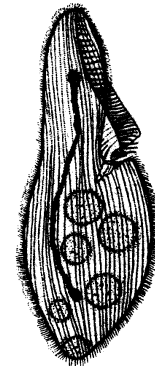
Spirostomum
1 - 3 mm in length



Colpidium
50 - 70 μm in length



Bursaria
500 - 1000 μm in length



Blepharisma
400 - 600 μm in length