

# Kingdom Fungi

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## *Objectives*

- Recognize the divisions of the kingdom Fungi
- Be able to identify the principal structures of the four fungal divisions
- Be able to identify lichens and the basic lichen types

## *Introduction*

Members of the kingdom Fungi, along with certain types of bacteria, perform the ecologically important function of decomposition of organic material. Without these organisms we would quickly be knee deep in organic wastes produced by living organisms.

The fungi have a characteristic growth form. Fungal cells are usually very thin and long, connected end to end. These strands are called hyphae. A mass of hyphal filaments is called a mycelium. When the fungus is ready to sexually reproduce, the hyphal strands grow together into a structure called a fruiting body. This structure is what is commonly thought of when one thinks of the fungi.

The Kingdom Fungi is usually divided into four divisions. One of the principle features that distinguish these divisions is the reproductive structure. The four divisions are the Zygomycetes, Ascomycetes, Basidiomycetes, and the Deuteromycetes.

In this simulation you will observe representative members of these groups. Select the Kingdom Fungi simulation within the Diversity section of the BiologyOne DVD.

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### **Activity 21.1** **Zygomycota**

The Zygomycetes are commonly called the Black Bread Molds. They reproduce both sexually and asexually. The asexual reproductive structures are called sporangio-phores and look somewhat like lollipops. These produce spores that are genetically identical to the parent fungus.

The sexual reproductive structure, called a zygospore, is produced when two mating strands join. Zygospores have a thick, black wall, thus the common name black bread mold. Zygospores produce offspring that are genetically different from the parents.

Examine the micrographs of *Rhizopus* in the Zygomycota section of the Kingdom Fungi simulation on the BiologyOne DVD. Identify the hyphae, zygospores, and sporangio-phores if present. Label the illustrations of these structures in the Results Section.

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### **Activity 21.2** **Ascomycota**

The Ascomycetes are commonly called the 'sac' or sometimes the 'cup' fungi. These fungi also reproduce asexually as well as sexually. The asexual reproductive structures are called conidia and are not too different in appearance from the sporangio-phores of the Zygomycetes. The sexually produced spores, the ascospores, are produced in elongate sacs (thus the 'sac fungi'). Inside the sacs, one meiotic cell division is followed by a mitotic cell division. This gives rise to a total of eight ascospores within each sac.

The fruiting body of Ascomycetes is made up of sterile hyphae and hundreds to thousands of spore producing sacs. Frequently the reproductive structure has a cup shape, giving rise to the other common name for this group.

In the Kingdom Fungi simulation, review the section covering the Ascomycota. Here you will observe the fruiting body of an edible ascomycete, a morel. Ascospores are produced on the surface of these folds of the fruiting body. The next two screens show the sexual and asexual structures found in another genus of ascomycete, *Peziza*. Study these so you can identify the structures seen. Label the illustrations of these structures in the Results Section.

#### ***Morrel***



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### **Activity 21.3** **Basidiomycota**

The Basidiomycetes are commonly called the club fungi due to the shape of the sexual reproductive structure. Asexual reproduction in the Basidiomycetes is rare. The club shaped reproductive structure produces four basidiospores on small spikes that project from the end of the club. This division contains mushrooms.

The first four screens in this section show examples of members of this division. The last micrograph shows you the sexual spores of *Coprinus*. This is a mushroom commonly sold at the grocery store. Find the clubs that produce the basidiospores. Usually only one or two spores will remain attached to a club when the slide is being made. Label the illustrations of these structures the Results Section.

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### **Activity 21.4** **Lichens**

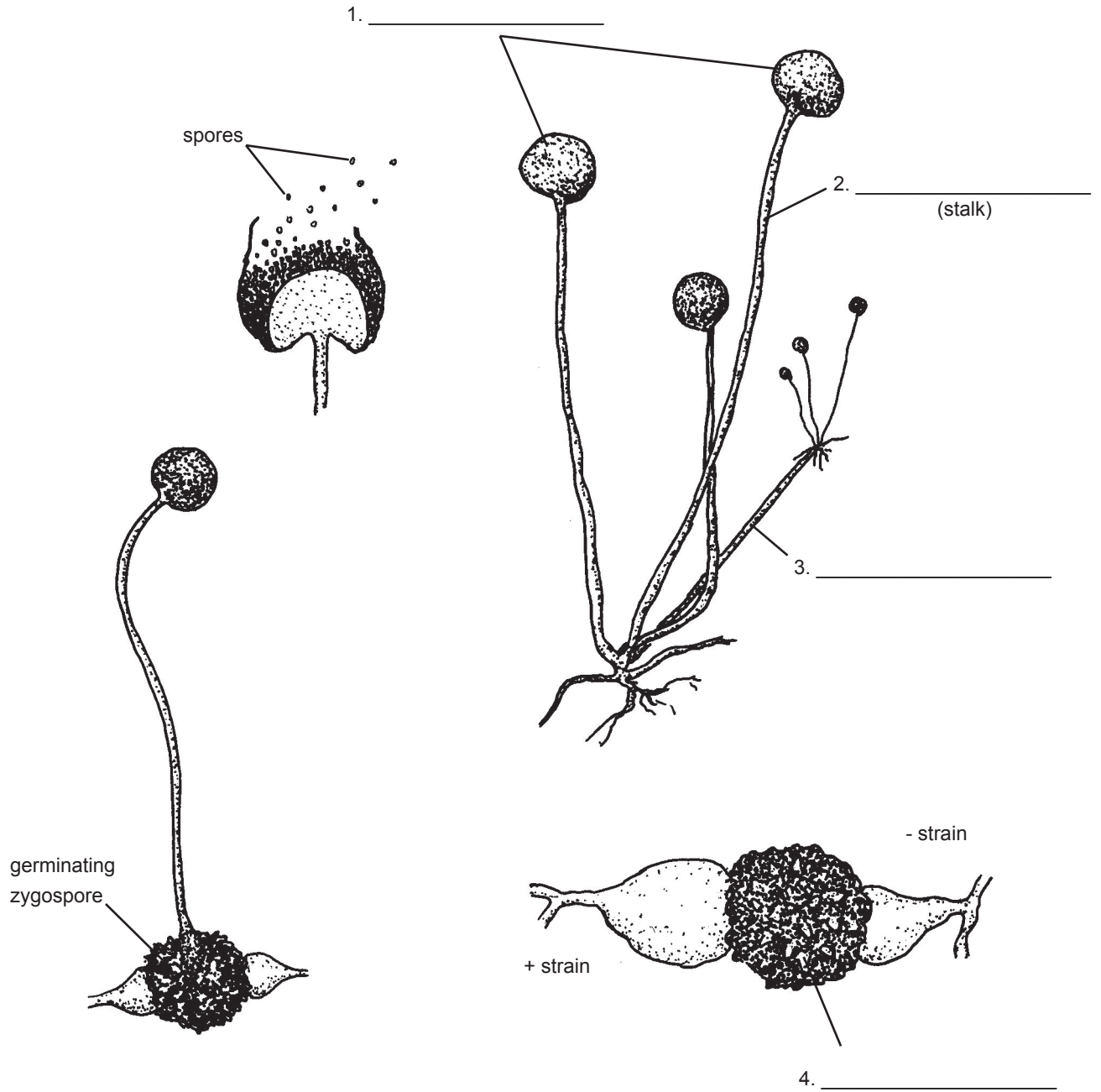
Lichens are not an organism per se but represent a symbiotic relationship between a fungus and an alga. Usually the fungus part of a lichen is an ascomycete type fungus.

The body of a lichen is referred to as a thallus. Three basic types of thalli are found in the lichens. A crustose thallus is flat and tightly adhering to its substrate. A foliose thallus is also flattened, but here the leaf-like lobes are not so tightly appressed to the substrate. The fruticose thallus appears like a small plant, having an erect stalk and branches.

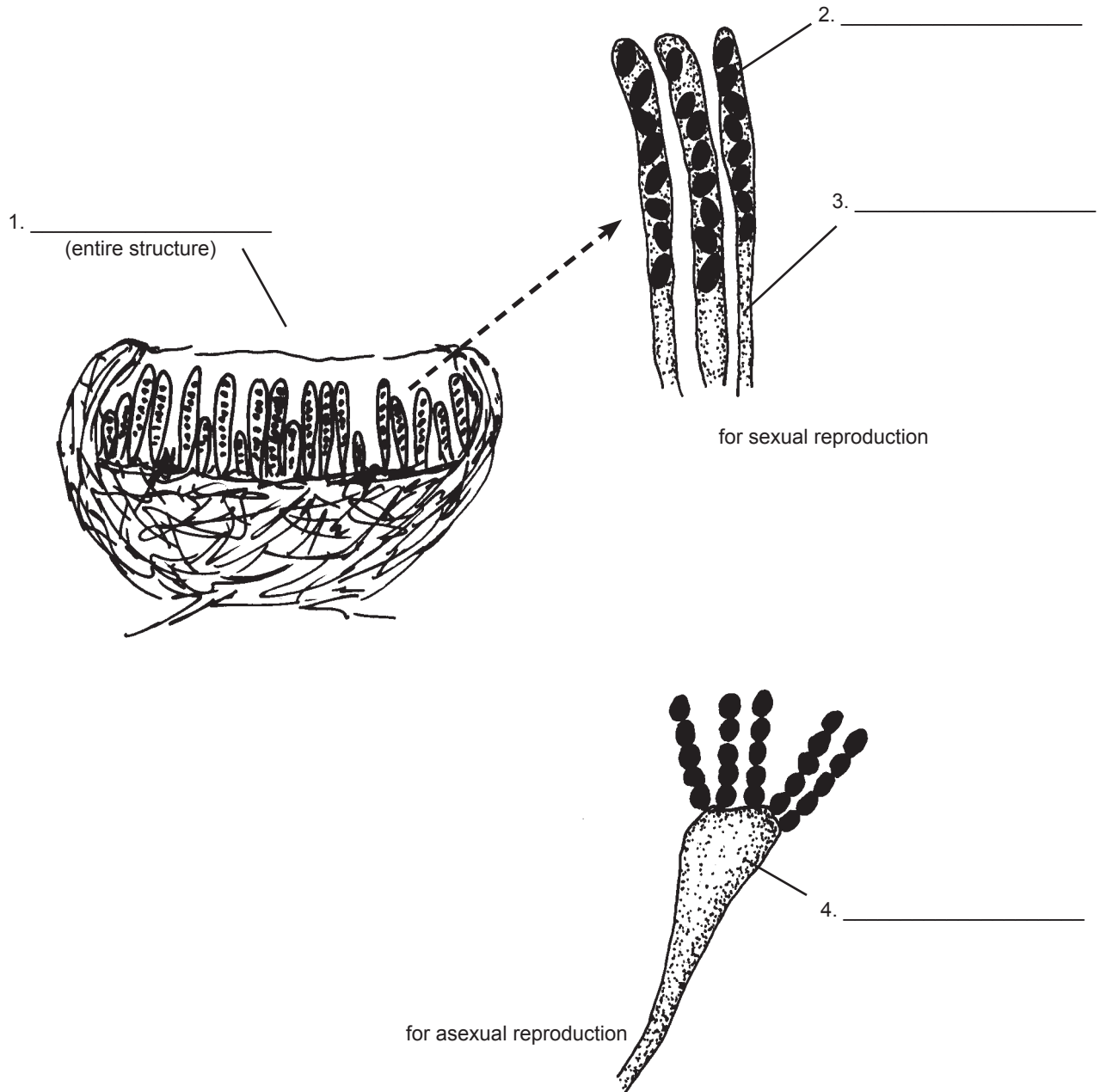
Examples of the different types of lichens are illustrated in the simulation. Identify the thallus type for each of the lichens shown in the Results Section.

# Results Section

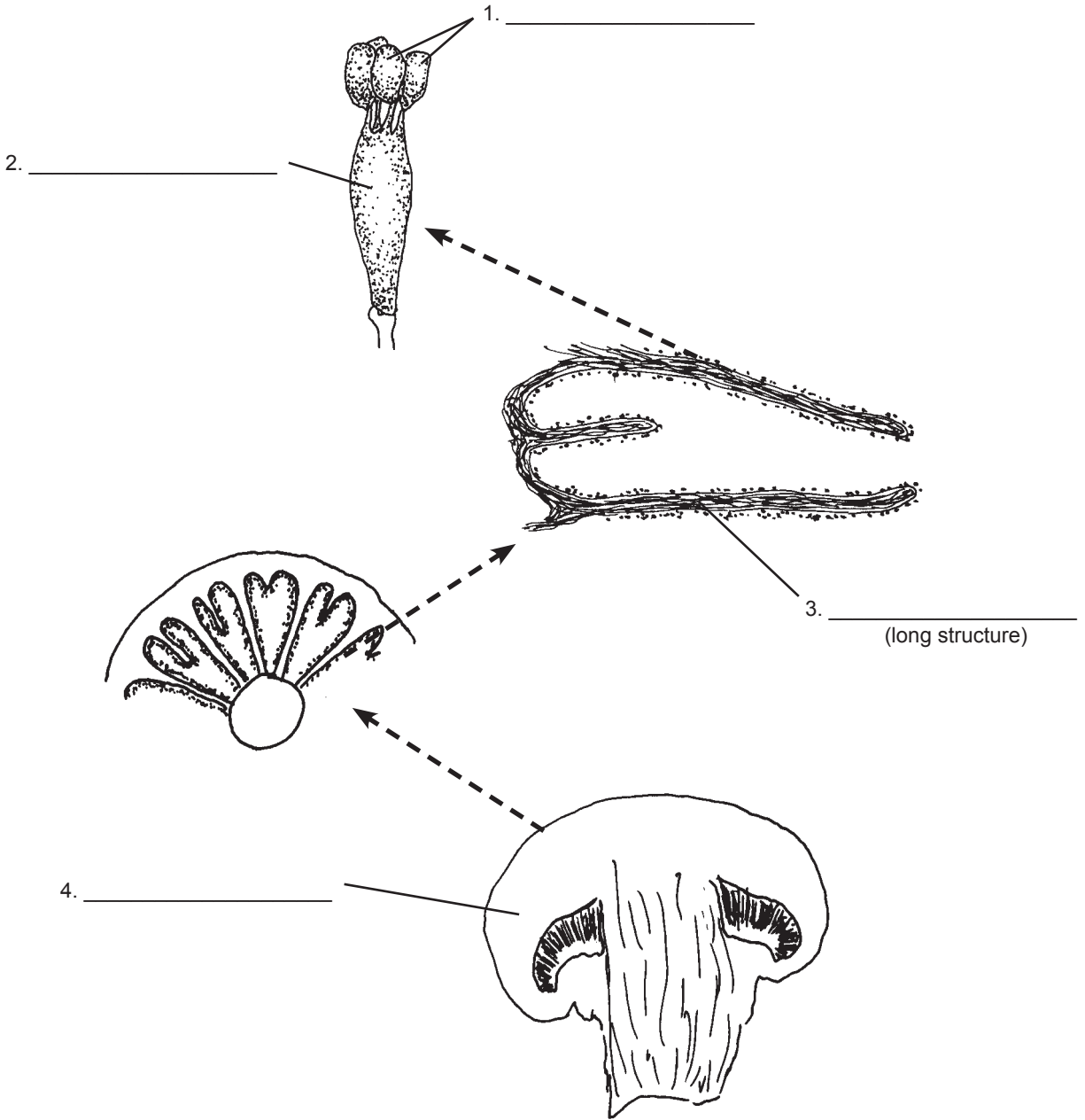
**Activity 21.1**  
**Zygomycota**



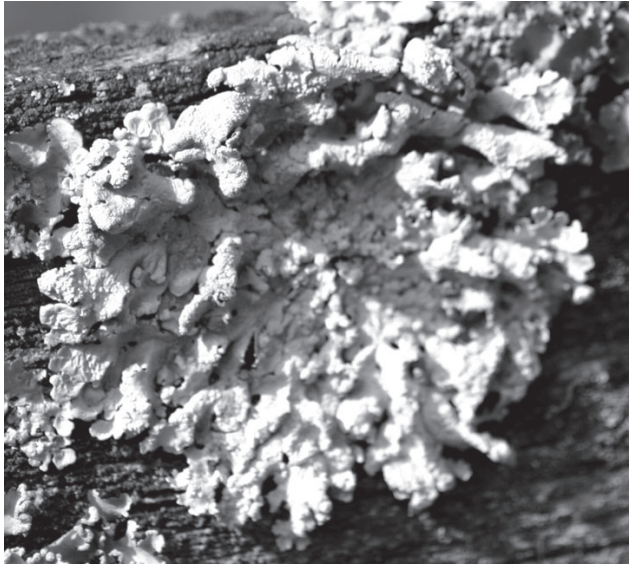
Activity 21.2  
Ascomycota



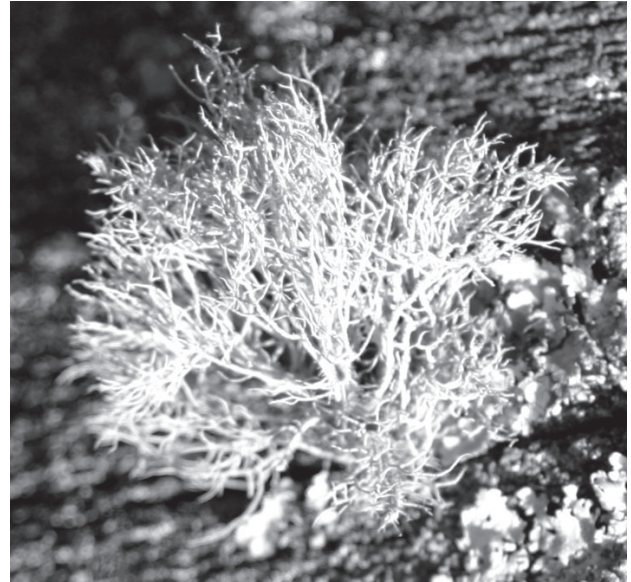
Activity 21.3  
Basidiomycota



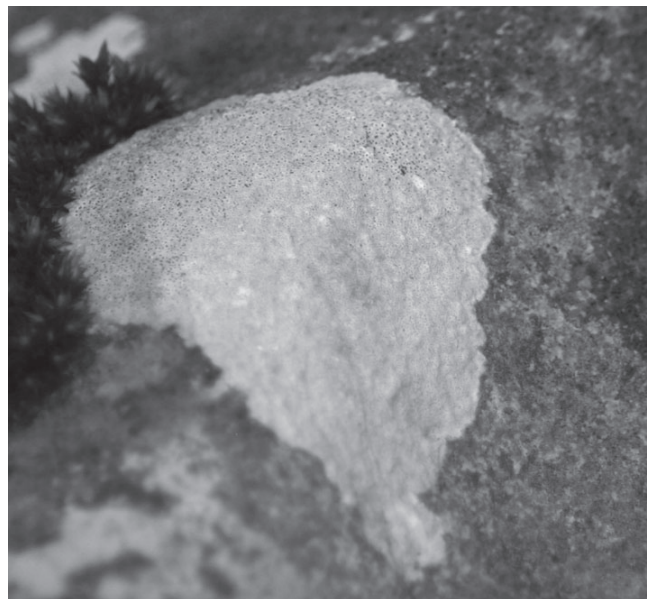
**Activity 21.4**  
**Lichens**



1. \_\_\_\_\_  
(lichen body type)



2. \_\_\_\_\_  
(lichen body type)



3. \_\_\_\_\_  
(lichen body type)