

## Section 3.2: Review Answers

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1. The categories in which organisms are grouped have changed over the last 2000 years as our understanding and knowledge of living things increases, and our abilities to apply new tools, such as more powerful microscopes, improve.
2. The challenge of identifying, classifying, and naming the organisms that make up the diversity of life on Earth has existed since humans first began to observe the environment around them. Taxonomy is the practice of classifying (grouping) living things.
3. Identifying a group as “flying animals” would not be useful to a biologist. Many different phyla of animals have particular species that can fly included in them (and not all members of these phyla can necessarily fly). A biologist would not know if you were talking about birds, bats, butterflies, mosquitoes, flying squirrels, flying fish, trapeze artists, or all—or none—of the above.

4. The chart below is an example of a chart summarizing the six kingdoms of living things.

| Kingdom  | Cell Type (prokaryotic or eukaryotic) | Unicellular or Multicellular  | Obtain Nutrients                                | Sessile or Mobile                                 | Example                                      |
|----------|---------------------------------------|-------------------------------|---|---|--|
| Archea   | prokaryotic                           | unicellular                   | chemosynthetic                                  | most sessile                                      | methane-producing bacteria                   |
| Bacteria | prokaryotic                           | unicellular                   | some heterotrophic<br>others are photosynthetic | most sessile                                      | disease-causing bacteria<br>blue-green algae |
| Protista | eukaryotic                            | unicellular and multicellular | some photosynthetic<br>others are heterotrophic | some sessile while others are mobile              | amoeba, paramecium, Euglena (mobile)         |
| Fungi    | eukaryotic                            | unicellular and multicellular | heterotrophic                                   | most sessile                                      | mushrooms, yeast, moulds                     |
| Plantae  | eukaryotic                            | multicellular                 | autotrophic (photosynthetic)                    | sessile   | flowering plants                             |
| Animalia | eukaryotic                            | multicellular                 | heterotrophic                                   | most mobile but some groups (sponges) are sessile | insects, mammals, birds                      |

5. (a) Squirrel: 1a; Tufted Puffin: 2a; Lamprey Eel: 3b; Trout: 5a; Shark: 5b; Snake: 6a; Frog: 6b.

(b) Squirrel → Step 1a. (Class Mammalia)

Tufted Puffin → Step 1b. → Step 2a. (Class Aves)

Lamprey eel → Step 1b. → Step 2b. → Step 3b., (Class Agnatha)

Trout → Step 1b. → Step 2b. → Step 3a. → Step 4a. → Step 5a. → Class Osteichthyes

Shark → Step 1b. → Step 2b. → Step 3a. → Step 4a. → Step 5b. → Class Chondrichthyes

Snake → Step 1b. → Step 2b. → Step 3a. → Step 4b. → Step 6a. → Class Reptilia

Frog → Step 1b. → Step 2b. → Step 3a. → Step 4b. → Step 6b. → Class Amphibia

6. It is useful and logical for all scientists to use the same system of classification to ensure that scientists from different parts of the world can collaborate on research and share information. The universal classification system allows scientists to name new discoveries in a way that other scientists can understand and incorporate into their own research.