### COMPETENCY GOAL 3: The learner will develop an understanding of the unity and diversity of life.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Objective</th>
<th>Curriculum Support</th>
<th>Suggested Activities</th>
<th>References</th>
</tr>
</thead>
</table>
| 3%     | 3.01      | Relate the variety of living organisms to their evolutionary relationships. | Current classification systems are based on the present state of knowledge of evolutionary relationships of organisms. Due to new and increased understanding of evolutionary relationships these classification systems are undergoing change. Contributing to the increased understanding are new methods including:  
- DNA analysis  
- Biochemical analysis  
- Better observation of embryological development | Activities that allow students to compare organism relationships such as those indicated by DNA or protein sequence analysis. | [http://phylogeny.arizona.edu/tree/phylogeny.html](http://phylogeny.arizona.edu/tree/phylogeny.html)  The “Tree of Life” website has information about the diversity and phylogeny of life. |
| 4%     | 3.02      | Classify organisms according to currently accepted systems. | Either a 5 or 6 Kingdom system may be taught with the understanding that taxonomic classification is changing as more is learned about the relatedness of various organism groups. Instruction should include:  
1) Distinguishing characteristics of  
   - Animals  
     - Chordata  
     - Arthropoda  
     - Annelida  
     - Mollusca  
     - Porifera  
     - Cnidaria  
   - Plants  
     - Mosses  
     - Ferns  
     - Gymnosperms  
     - Angiosperms  
   - Fungi  
   - Understanding of the shifting definition of Protists.  
   - Overall characteristics of Monera.  
   *Students are not expected to distinguish groups of Monera.*  
2) Compare and contrast viruses to living organisms.  
3) Examine the binomial naming system and familiarize students with the use of dichotomous keys.  
4) Contribution of Carolus Linnaeus. | 1) Activities that allow students opportunities to identify most related species and least related species when given taxonomy.  
2) Utilization of dichotomous keys to identify organisms.  
3) Activities that require students to create a dichotomous key. | [http://www.mindspring.com/~zoonet/wwwirtual_lib/zoos.html](http://www.mindspring.com/~zoonet/wwwirtual_lib/zoos.html)  This site links to zoos and other animal related sites.  
[http://www.naturalia.org/ZOO/indexing.html](http://www.naturalia.org/ZOO/indexing.html)  This is a virtual zoo site.  
[http://commtechlab.msu.edu/sites/dle-me/zoo/](http://commtechlab.msu.edu/sites/dle-me/zoo/)  This is a microbial zoo site with lots of information about microbes presented in an entertaining manner. |
### COMPETENCY GOAL 3: The learner will develop an understanding of the unity and diversity of life.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Objective</th>
<th>Curriculum Support</th>
<th>Suggested Activities</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td><strong>3.03</strong> Determine the form and function of organisms including:</td>
<td>Emphasis should be placed on how the variety of multicellular organisms handle the problems of regulation, nutrition, internal transport, reproduction, support and movement.</td>
<td>Inquiry Support Lab – Animal Kingdom Diversity</td>
<td><a href="http://curry.edschool.virginia.edu/go/frog/home.html">http://curry.edschool.virginia.edu/go/frog/home.html</a></td>
</tr>
<tr>
<td></td>
<td><strong>3.03a</strong> Organ systems of animals.</td>
<td>1) Animal systems to include: • Body covering • Cardiovascular • Digestive • Endocrine • Excretory • Immune • Muscular • Nervous • Reproductive • Respiratory • Support</td>
<td>Dissection or alternative activities for the purpose of comparing systems in different phyla.</td>
<td><a href="http://arbl.cvmbs.colostate.edu/hbooks/pathphys/endocrine/basics/control.html">http://arbl.cvmbs.colostate.edu/hbooks/pathphys:endocrine/basics/control.html</a></td>
</tr>
<tr>
<td></td>
<td><strong>3.03b</strong> Functional systems of plants including: transport, reproduction, and regulation.</td>
<td>Focus should be on physiology not anatomy. <em>Excessive vocabulary and detail is to be avoided.</em></td>
<td>Inquiry Support Lab – Cellular Respiration in Germinating Seeds Recommended also for 1.06. 1) Investigations of water transport, function of stomates, seed dispersal and germination.</td>
<td> </td>
</tr>
<tr>
<td>5%</td>
<td><strong>3.04</strong> Compare and contrast the processes of reproduction, growth, development, and regulation of major phyla of organisms.</td>
<td>1) Emphasis should be placed on: • Life cycles • Characteristics of reproduction • Growth and development</td>
<td>1) Raise a local invertebrate species and follow it through its life cycle, comparing it to other species.</td>
<td> </td>
</tr>
</tbody>
</table>
## COMPETENCY GOAL 3: The learner will develop an understanding of the unity and diversity of life.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>2%</td>
<td>3.05 Determine the internal and external factors that influence the growth and development of organisms.</td>
</tr>
</tbody>
</table>

### Curriculum Support
- Chordata
- Arthropoda
- Annelida
- Mollusca
- Porifera
- Cnidaria

Plant divisions to include:
- Mosses
- Ferns
- Gymnosperms
- Angiosperms

Students should have a general idea of how these functions are carried out in the other kingdoms (Monera, Protista, Fungi).

2) Compare and contrast adaptations to life in various terrestrial and aquatic environments. *While students should be exposed to the other phyla in class or lab, memorization is not expected.*

<table>
<thead>
<tr>
<th>Suggested Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2) Examine, compare and contrast a variety of angiosperm and gymnosperm seeds.</td>
</tr>
<tr>
<td>3) Determine the function of different seed parts.</td>
</tr>
</tbody>
</table>

Students should be able to assess the roles of:
- Genetics
- Nutrition
- Other environmental factors in the growth and development of plants and animals (including zygote, embryo, fetus, and seed).

1) Examination of twin studies. 
2) Comparison of the variety of gender determination processes (as in groups of animals like turtles, crocodiles and birds) 
3) Opportunities for students to participate in plant studies.

### References
- [http://www.psych.umn.edu/psylab/s/mtfs/special.htm](http://www.psych.umn.edu/psylab/s/mtfs/special.htm) This is the University of Minnesota’s site for twin studies which includes the page: “What’s special about twins to science”.
- [http://www.niaaa.nih.gov/publications/aa18.htm](http://www.niaaa.nih.gov/publications/aa18.htm) The National Institute on Alcohol Abuse and Alcoholism presents a discussion of the genetics of alcoholism. This discussion will be too technical for most students but may be helpful to teachers and more advanced students.
- [http://faculty.washington.edu/chudler/alco.html](http://faculty.washington.edu/chudler/alco.html) This page has information about the effects of alcohol on the body and links to pages on fetal alcohol syndrome.

### Total Weight for Goal 3
19%