Discussion Leader Activity: Compare and Contrast Vocabulary

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Created for: Bio 93 Fall 2010

Activity Type: Group worksheet and class discussion

Time Needed in Discussion: 35 minutes

Learning goals: By the end of this activity, students will be able to:
• Describe biological terms to their peers
• Articulate the differences between commonly confused biological terms
• Demonstrate how to translate definitions from lecture and textbook into a study technique

Abstract

<table>
<thead>
<tr>
<th>Pre-class prep</th>
<th>30 min</th>
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<tbody>
<tr>
<td>Teacher describes activity, assign individual words and groups</td>
<td>5 min</td>
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<tr>
<td>Students work on formulating their sentences</td>
<td>10 min</td>
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<tr>
<td>Students share their sentences within their group</td>
<td>10 min</td>
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<tr>
<td>Groups present best answers</td>
<td>10 min</td>
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Supplies

• Worksheet, word pair index cards

Pre-class prep

• Create and post worksheet (see attached example)
• Write out index cards with word pairs, clip into group stacks
• Assign groups (if desired – can create groups with both confused and capable students)

In Class

1. (5 min) Introduce the activity, explain that there are many terms the students must learn, remember and understand. As their biological education continues they will not only need to know these for the Bio 93 final, but for the rest of their courses. Break the students up into groups of 4-5 (the number of students in the group will match the number of word pair sets you have prepared). Give a word pair card to each student of the group.

2. (10 min) Allow the students to formulate their sentences. They should use their lecture notes and textbooks. Walk around and assist any students that may be having trouble. Lead them to possible answers, but avoid directly giving answers to them.

3. (10 min) Announce that everyone should have finished their assigned sentences, and now they are to share it within their group. Continue walking around and listening in on the groups. Encourage students to pick out the best examples from each group as you listen.
4. (10 min) Call the attention of the class. Have each group present to the class their best examples. As the students present, add to their definitions, ask questions about examples of each (pink snapdragons for co-dominance, Bruce Willis for epistasis, etc.). Show how developing the sentences can help the students decipher one example from the other.

5. If time, direct students to a lecture and tell them to find their own word pair. Or give a quiz that requires them to utilize the vocabulary they have just learned.

You can collect the best sentences and post online for the students as a student guide.

**Things to Ask or Emphasize**

- Continue to drive home that simple memorization of glossary definitions will not be enough to do well on exams. This is a study technique that will help them throughout their biology education.
- It is easier and more useful to learn differences then to memorize definitions, and these terms are commonly confused by past students.
- Those students who are auditory learners should practice explaining these terms to their group mates. Those students who are read/write learners should write out their sentences multiple times.

**Comments**

- Chose pairs that are commonly confused and include a prompt that addresses their similarities and differences, i.e. chromosome number or protein expression.
- This will not take the entire discussion time. Including a quiz at the beginning or end that incorporates the terms discussed will enforce how this exercise may be beneficial. For example, this question below should be easily answerable after comparing and contrasting incomplete dominance and co-dominance:

  **Question:** Pink snapdragon flowers, the result of a cross between red and white flowers, are an example of incomplete dominance because:
  a. the red allele is the wild-type
  b. red pigment protein is expressed at low levels
  c. heterozygotes express a pink protein
  d. 50% of the progeny are heterozygotes
  e. both red and white pigments are produced

- Or this one after comparing and contrasting Mitosis, Meiosis I or Meiosis II:

  **Question:** Which of the following is TRUE at the conclusion of Meiosis I in humans?
  a. Homologous chromosomes are separated.
  b. The chromosome number per cell is conserved.
  c. Sister chromatids are separated
  d. Chromosome number falls from 92 to 46
  e. The daughter cells are diploid

Special thanks to Diane O’Dowd for the suggestion of the compare/contrast sentence structure.
Sample Worksheet:

Bio 93 Discussion – Compare and Contrast Vocabulary

Directions: For the word pair you have been given, formulate 3-4 statements:
1. A “compare” statement that indicates what the biology of the terms have in common. This will usually have the compare word “like” or “similar” in it.
2. A “contrast” statement that indicates how the biology of the terms differs. This will usually have a contrast word like “in contrast” or “however” in it.
3. An “example” statement (or two) that explains the biology of the examples of the word pair given in class that uses the key word given.

Example: Epistasis and polygenic inheritance. Key word = protein expression

Sample Answer:
1. Epistasis, like polygenic inheritance, has multiple genes affecting a single phenotype.
2. Epistasis alters the phenotypic expression of a gene at a second locus in contrast to polygenic inheritance that is an additive effect of multiple genes affecting a single phenotype.
3. In class, we saw that if the epistatic gene that allows for the coat color in mice to be present is homozygous recessive, there will be no protein expression of the pigment genes. In polygenic inheritance, the protein expression by many genes will cause there to be a large variation in the resulting phenotype.

Write the statements for the word pair you are given below:

Word Pair:

Key word:

Statements: