Expected Outcome 1: Communication

Communicate horticultural information or knowledge effectively in written and oral formats.

Assessment Method 1: Scoring Rubric

Assessment Method Description

Scoring rubrics (attached) were developed that could be used to evaluate written assignments or oral presentation regardless of course. Faculty members were asked if any of their classes contained written assignments or oral presentations. If so, faculty members were asked if they would be willing to use these common rubrics and when they would use them. This was to identify those courses and facilitate collection of these rubrics as used throughout the year in different courses. Rubrics are to be completed by the instructor for that course. The current format of the rubric is a hard copy that requires the instructor to select by hand a score value for each attribute on the rubric. The rubric also asks the instructor to indicate the course and the type of assignment. Copies of the rubrics are then provided to the departmental SACS Assessment Committee who tallies the scores. The scoring rubric for written assignments was used for two assignments (resume and cover letter) in HORT 3950 Careers in Horticulture, a cover letter in HORT 1010 Intro to Horticulture, a business plan in HORT 5230 Nursery Management, and a research paper in HORT 2050 Food for Thought in Fall 2013. The scoring rubric for oral assignments was used in HORT 5120 Small Fruit Pecan Culture. The Departmental Scoring Rubrics are in Appendix A. The Scoring Rubric Use Schedule is in Appendix B.

Findings

A scoring rubric use schedule (attached) was prepared based on faculty responses for those courses that have a written assignment or oral presentation. Ten courses were identified in which the instructor was willing to utilize one or both of the scoring rubrics for either a written assignment or an oral presentation. Three of these courses are offered more than one semester per year. Four are offered in the spring, three in summer, and six in fall. This should allow for the collection of data for different types of assignments and different course levels. The rubrics developed are easy to use by the instructor and appear to be a thorough way to standardize assessment of student performance across multiple courses and
assignment types. Tallying the scores from the rubrics by hand is a bit tedious and time consuming but not prohibitively so. Results from data collected indicate that most improvement is needed in the areas of format and grammar (Table 1).

**Table 1. Rubric scores for written assignments in Fall 2013.**

<table>
<thead>
<tr>
<th>Written Assignments</th>
<th>HORT 3950</th>
<th>HORT 3950</th>
<th>HORT 1010</th>
<th>HORT 5230</th>
<th>HORT 2050</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resume</td>
<td>4.1</td>
<td>3.7</td>
<td>4.3</td>
<td>4</td>
<td>4.3</td>
<td>4.1</td>
</tr>
<tr>
<td>Letter</td>
<td>4.3</td>
<td>3.9</td>
<td>4.1</td>
<td>3.3</td>
<td>4.3</td>
<td>4.0</td>
</tr>
<tr>
<td>Organization</td>
<td>4.6</td>
<td>4</td>
<td>4.1</td>
<td>4.3</td>
<td>4.2</td>
<td>4.2</td>
</tr>
<tr>
<td>Format</td>
<td>3.8</td>
<td>3.3</td>
<td>3.6</td>
<td>4</td>
<td>4</td>
<td>3.7</td>
</tr>
<tr>
<td>Grammar</td>
<td>3.9</td>
<td>3.4</td>
<td>3.5</td>
<td>3.5</td>
<td>4.4</td>
<td>3.7</td>
</tr>
<tr>
<td>Spelling</td>
<td>5</td>
<td>5</td>
<td>4.6</td>
<td>4.5</td>
<td>4.6</td>
<td>4.7</td>
</tr>
<tr>
<td>Overall</td>
<td>4</td>
<td>3.3</td>
<td>4.8</td>
<td>3.6</td>
<td>4.3</td>
<td>4.0</td>
</tr>
<tr>
<td>N</td>
<td>23</td>
<td>20</td>
<td>65</td>
<td>10</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

**Oral Assignments**

| Organization        | 3.8       |
| Complete            | 4.0       |
| Accurate            | 4.3       |
| Vis. Aids           | 4.2       |
| Spelling            | 4.7       |
| Audible             | 4.2       |
| Professional        | 4.0       |
| Answers             | 4.5       |
| Overall             | 4.2       |
| N                   | 18        |

**How did you use findings for improvement?**

More data evaluating different types of written assignments and oral presentations are needed. We will continue to collect scoring rubrics throughout the year. In addition to evaluating the overall scores of our students, we will also examine whether there are particular types of assignments in which our students show strengths/weaknesses. Although we may be able to draw some conclusions after one year of data, it may also necessary to evaluate multiple years of data to get a better representation of student performance on written assignments and oral presentations. Data will also be used to identify areas (content, format, grammar)
that may need improvement so we can target our efforts at improving those aspects of communication. As data collected expands over time, it may be necessary to identify a way to collect rubric scores electronically.

**Additional Comments**

**Assessment Method 2:** Senior / Alumni Survey

**Assessment Method Description**
This will be a self-assessment survey that will contain questions that ask seniors and alumni to describe how well they think their degree in Horticulture prepared them in this area. In addition to identifying their attitudes regarding their preparation, we will also use data to compare how attitudes change over time by comparing senior responses to alumni responses. The survey will be on-line, and seniors and alumni will be contacted via email and asked to complete the survey. Survey is currently being developed, and seniors and alumni will be asked to complete this survey beginning Fall 2014.

**Findings**
N/A

**How did you use findings for improvement?**

We anticipate that survey responses will allow us to identify strengths and weaknesses in our program, particularly when compiled over multiple semesters and years.

**Additional Comments**

**Assessment Method 3:** Industry / Employer Survey

**Assessment Method Description**
This will be a survey completed by industry professionals who interact with our students (trade shows, conferences, student activities) or employ or interview our students. Respondents will be asked to evaluate how well prepared they think our students and graduates are for careers relating to Horticulture. Survey is currently being developed, and industry / employers will be asked to complete this survey beginning Fall 2014.

**Findings**
N/A

**How did you use the findings for improvement?**
We anticipate that survey responses will allow us to identify strengths and weaknesses in our program, particularly when compiled over multiple semesters and years.

**Additional Comments**

**Expected Outcome 2: Horticultural Knowledge**
Demonstrate knowledge of horticultural plant biology, identification, and culture.

**Assessment Method 1: Pre-test / Post-test**

**Assessment Method Description**
A multiple choice test (attached) was created to test general knowledge of horticulture plant propagation, physiology, identification, and culture. The test will be administered during fall semesters at the beginning of the semester in Introduction to Horticulture HORT 1010 (pre-test) and at the end of the semester in Careers in Horticulture HORT 3950 (post-test). Respondents are asked to indicate classification (FR, SO, JR, SR), area of emphasis in major (if Horticulture major), and number of horticulture classes completed. The pre-test and post-test were administered in Fall 2013. Both pre- and post- test will be administered each subsequent Fall semester. Currently, students complete the multiple-choice test by actually circling their answer on the test, and the tests are graded by hand by the departmental SACS Assessment Committee. The Pre Post Test is in Appendix C.

**Findings**
Based on the topics covered, it is appropriate to give the pre-test at the beginning of the semester and the post-test at the end of the semester. Being able to sort responses based on year and Horticulture major/emphasis was helpful for analyzing responses. The test did not provide a way to distinguish between horticulture courses completed at Auburn or elsewhere. Calculating scores and information about the respondents by hand was a bit tedious and time consuming but not prohibitively so. While not statistically analyzed, it appeared as though student knowledge increased with increasing classification and number of Horticulture classes completed (Table 2).
Table 2. Results from pre-test and post-test of horticulture knowledge (scores out of 100).

<table>
<thead>
<tr>
<th>Classification</th>
<th>Score</th>
<th>N</th>
<th>Hort. Courses</th>
<th>Score</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR</td>
<td>59</td>
<td>18</td>
<td>0</td>
<td>61</td>
<td>26</td>
</tr>
<tr>
<td>SO</td>
<td>61</td>
<td>10</td>
<td>1-2</td>
<td>58</td>
<td>6</td>
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<tr>
<td>JR</td>
<td>70</td>
<td>8</td>
<td>3-4</td>
<td>73</td>
<td>2</td>
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<tr>
<td>SR</td>
<td>78</td>
<td>2</td>
<td>More than 4</td>
<td>76</td>
<td>4</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Classification</th>
<th>Score</th>
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<th>Hort. Courses</th>
<th>Score</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR</td>
<td>--</td>
<td>--</td>
<td>0</td>
<td>--</td>
<td>--</td>
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<tr>
<td>SO</td>
<td>--</td>
<td>--</td>
<td>1-2</td>
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<tr>
<td>JR</td>
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<td>5</td>
<td>3-4</td>
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<tr>
<td>SR</td>
<td>71</td>
<td>10</td>
<td>More than 4</td>
<td>75</td>
<td>14</td>
</tr>
</tbody>
</table>

How did you use findings for improvement?
Future versions of the test will ask the respondent to indicate the number of Horticulture courses completed at AU. In the future the test should be administered using scan-tron to allow electronic compilation and more thorough assessment of the data. Once the results from the post-test are available, it will be possible to more thoroughly evaluate the success of our program for increasing students' general horticulture knowledge. Additionally, it will allow us to identify horticulture topics in which our students show strengths and weaknesses.

Additional Comments

Assessment Method 2: Senior / Alumni Survey

Assessment Method Description
This will be a self-assessment survey that will contain questions that ask seniors and alumni to describe how well they think their degree in Horticulture prepared them in this area. In addition to identifying their attitudes regarding their preparation, we will also use data to compare how attitudes change over time by comparing senior responses to alumni responses. The survey will be on-line, and seniors and alumni will be contacted via email and asked to complete the
survey. Survey is currently being developed, and seniors and alumni will be asked to complete this survey beginning Fall 2014.

Findings
N/A

How did you use findings for improvement?

We anticipate that survey responses will allow us to identify strengths and weaknesses in our program, particularly when compiled over multiple semesters and years.

Additional Comments

Assessment Method 3: Industry / Employer Survey

Assessment Method Description

This will be a survey completed by industry professionals who interact with our students (trade shows, conferences, student activities) or employ or interview our students. Respondents will be asked to evaluate how well prepared they think our students and graduates are for careers relating to Horticulture. Survey is currently being developed, and industry / employers will be asked to complete this survey beginning Fall 2014.

Findings

N/A

How did you use the findings for improvement?

We anticipate that survey responses will allow us to identify strengths and weaknesses in our program, particularly when compiled over multiple semesters and years.

Additional Comments
**Expected Outcome 3: Networking**

Demonstrate skills for networking with horticulture industry professionals and consumers of horticultural products.

**Assessment Method 1:** Senior / Alumni Survey

**Assessment Method Description**

This will be a self-assessment survey that will contain questions that ask seniors and alumni to describe how well they think their degree in Horticulture prepared them in this area. In addition to identifying their attitudes regarding their preparation, we will also use data to compare how attitudes change over time by comparing senior responses to alumni responses. The survey will be on-line, and seniors and alumni will be contacted via email and asked to complete the survey.

**Findings**

Survey is currently being developed, and seniors and alumni will be asked to complete this survey beginning Spring 2014.

**How did you use findings for improvement?**

We anticipate that survey responses will allow us to identify strengths and weaknesses in our program, particularly when compiled over multiple semesters and years.

**Additional Comments**

**Assessment Method 2:** Industry / Employer Survey

**Assessment Method Description**

This will be a survey completed by industry professionals who interact with our students (trade shows, conferences, student activities) or employ or interview our students. Respondents will be asked to evaluate how well prepared they think our students and graduates are for careers relating to Horticulture.

**Findings**

Survey is currently being developed, and industry / employers will be asked to complete this survey beginning Spring 2014.

**How did you use findings for improvement?**

We anticipate that survey responses will allow us to identify strengths and
weaknesses in our program, particularly when compiled over multiple semesters and years.

Additional Comments

Expected Outcome 4: Practical Skills
Demonstrate practical skills commonly used for horticultural practices.

Assessment Method 1: Laboratory Assignments

Assessment Method Description
Courses that contain a laboratory portion will be identified. From these courses the instructor will be asked to identify one laboratory exercise that demonstrates a practical skill that students should have mastery of upon completing that course. Instructors will then be asked to submit scores for that assignment to the committee. The courses, exercises, semester, and month will then be compiled into a schedule similar to the one created for “Communication” learning outcome.

Findings
Scores will be used to assess student learning as it relates to a broad range of practical skills that horticulture students would be expected to know. Additionally, we will have list of some key practical skills and when they are taught in our program.

How did you use findings for improvement?
Findings will indicate strengths and weaknesses of our students in demonstrating practical skills.

Additional Comments

Assessment Method 2: Senior / Alumni Survey

Assessment Method Description
This will be a self-assessment survey that will contain questions that ask seniors and alumni to describe how well they think their degree in Horticulture prepared them in this area. In addition to identifying their attitudes regarding their preparation, we will also use data to compare how attitudes change over time by comparing senior responses to alumni responses. The survey will be on-line, and seniors and alumni will be contacted via email and asked to complete the survey. Survey is currently being developed, and seniors and alumni will be asked to complete this survey beginning Fall 2014.

Findings
N/A

How did you use findings for improvement?
We anticipate that survey responses will allow us to identify strengths and weaknesses in our program, particularly when compiled over multiple semesters and years.

Additional Comments

Assessment Method 3: Industry / Employer Survey

Assessment Method Description
This will be a survey completed by industry professionals who interact with our students (trade shows, conferences, student activities) or employ or interview our students. Respondents will be asked to evaluate how well prepared they think our students and graduates are for careers relating to Horticulture. Survey is currently being developed, and seniors and alumni will be asked to complete this survey beginning Fall 2014.

Findings
N/A

How did you use the findings for improvement?
We anticipate that survey responses will allow us to identify strengths and weaknesses in our program, particularly when compiled over multiple semesters and years.

Additional Comments
Appendix A

Writing Assignment

Horticulture Departmental Scoring Rubric

1 = unacceptable, 2 = poor, 3 = fair, 4 = good, 5 = excellent

Content
Organization 1 2 3 4 5
Complete 1 2 3 4 5
Accuracy 1 2 3 4 5

Format 1 2 3 4 5
Grammar 1 2 3 4 5
Spelling 1 2 3 4 5
Overall 1 2 3 4 5

Course #________

Type of writing assignment (check one)
_____ Professional communication (ex. letter)
_____ Resume
_____ Lab report
_____ Research paper
_____ Design
_____ Popular article
_____ Other (describe): ____________________________________________
### Oral Presentation

**Horticulture Departmental Scoring Rubric**

1 = unacceptable, 2 = poor, 3 = fair, 4 = good, 5 = excellent

<table>
<thead>
<tr>
<th>Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
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<tbody>
<tr>
<td>Content</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Complete</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Accuracy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Visual aids</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Spelling</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Delivery</td>
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<td></td>
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<td>Audible</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Professional</td>
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<td>3</td>
<td>4</td>
<td>5</td>
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<td>Answers to questions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Overall</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Course #________**

**Type of presentation (check one)**

- [ ] Research
- [ ] Demonstration
- [ ] Design
- [ ] Technical
- [ ] Popular
- [ ] Other (describe): ________________________________________________
### Appendix B

**Written Assignment / Oral Presentation Scoring Rubric Use Schedule**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Name</th>
<th>Instructor</th>
<th>Semester</th>
<th>Month</th>
<th>Written/Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>2240</td>
<td>Plant Propagation</td>
<td>Fain</td>
<td>Spring</td>
<td>April</td>
<td>W, O</td>
</tr>
<tr>
<td>5120</td>
<td>Small Fruit and Pecan Culture</td>
<td>Spiers</td>
<td>Spring, even</td>
<td>April</td>
<td>W</td>
</tr>
<tr>
<td>5130</td>
<td>Sustainable Vegetable Production</td>
<td>Foshee</td>
<td>Spring</td>
<td>April</td>
<td>W</td>
</tr>
<tr>
<td>5910</td>
<td>Horticulture Practicum</td>
<td>Williams</td>
<td>Spring</td>
<td>April</td>
<td>W, O</td>
</tr>
<tr>
<td>3000 Growth</td>
<td>Horticultural Plants</td>
<td>Wright</td>
<td>Summer</td>
<td>July</td>
<td>W</td>
</tr>
<tr>
<td>5110</td>
<td>Tree Fruit Culture</td>
<td>Spiers</td>
<td>Summer, odd</td>
<td>July</td>
<td>W, O</td>
</tr>
<tr>
<td>2240</td>
<td>Plant Propagation</td>
<td>Fain</td>
<td>Summer</td>
<td>July</td>
<td>W, O</td>
</tr>
<tr>
<td>3950</td>
<td>Careers in Horticulture</td>
<td>Ponder</td>
<td>Fall</td>
<td>September</td>
<td>W</td>
</tr>
<tr>
<td>3000 Growth</td>
<td>Horticultural Plants</td>
<td>Wright</td>
<td>Fall</td>
<td>December</td>
<td>W</td>
</tr>
<tr>
<td>2020</td>
<td>Horticulture Crop Production</td>
<td>Spiers</td>
<td>Fall</td>
<td>December</td>
<td>O</td>
</tr>
<tr>
<td>2020</td>
<td>Horticulture Crop Production</td>
<td>Beauchamp</td>
<td>Fall</td>
<td>December</td>
<td>W, O</td>
</tr>
<tr>
<td>1010</td>
<td>Introduction to Horticulture</td>
<td>Williams</td>
<td>Fall</td>
<td>December</td>
<td>W</td>
</tr>
<tr>
<td>5203</td>
<td>Nursery Management</td>
<td>Newby</td>
<td>Fall</td>
<td>December</td>
<td>W</td>
</tr>
</tbody>
</table>
Appendix C

A. General Information
1) What is your current classification?
a) FR  
 b) SO  
c) JR  
d) SR

2) Are you currently majoring in Horticulture
 a) Yes  
b) No

3) If you are a Horticulture major, please indicate your current curriculum track:
 a) Landscape Horticulture  
b) Pre-Landscape Architecture  
c) Nursery / Greenhouse Production  
d) Fruit / Vegetable Production

4) How many Horticulture classes have you completed?
 a) 0  
 b) 1-2  
c) 3-4  
d) >4

B. Please answer each the following questions to the best of your ability. There are no negative consequences for a wrong answer, so please select an answer for every question.
1) What is horticulture?
 a) The orderly classification of plants useful to mankind.  
b) The branch of agriculture concerned with intensely cultivated plants, directly and indirectly used by people for food, medicine, and aesthetics.  
c) The science art and business of cultivating the soil, producing crops and raising livestock useful to man.  
d) Growing cotton, soybeans and peanuts.

2) The subdivision of horticulture involved with growing vegetable crops is known as:
 a) Pomology  
b) Floriculture  
c) Arboriculture  
d) Olericulture

3) Research, Instruction, and __________________ are the three principle components of the land-grant university.
 a) Athletics  
b) Extension  
c) Exploration  
d) Engineering
4) Botanically speaking, a tomato is a
a) Fruit
b) Leaf
c) Stem
d) Vegetable

5) Soil pH is the measurement of the concentration of _____.
a) Potassium (K+)
b) Hydrogen (H+)
c) Nitrogen
d) Phosphorus

6) “Alternate bearing” is used to describe trees that ______.
a) Produce fruit every other year
b) Are perennial
c) Produce fruit on alternate branches
d) Produce a heavy crop one year, followed by a light crop the next year

7) When male and female flowers are produced on separate plants, this is known as:
a) Deciduous
b) Parthenocarpic
c) Perfect
d) Dioecious

8) Why is the accumulation of chilling hours required in order for temperate trees to flower?
a) To allow plants to recover from hot summers
b) To delay growth/bloom until after cold weather
c) To prevent tropical areas from producing certain fruit crops
d) To aid in color development

9) Which naturally occurring plant hormone is responsible for inducing apical dominance?
a) Ethylene
b) Cytokinin
c) Gibberellic acid
d) Auxin

10) The development of pesticide resistance in a pest or pathogen is accelerated if
a) Biological control tactics are utilized
b) Several chemicals are alternately used to control a given pest or pathogen
c) Only one chemical is repeatedly used to control the pest or pathogen
d) An integrated management strategy is used

11) What which of the following are provided by a propagation substrate?
a) Support
b) Water holding capacity
c) Air space
12) Which of the following propagation techniques are NOT asexual/clonal?
   a) Grafting
   b) Cutting
   c) Layering
   d) Seed

13) What does it mean when a nutrient is immobile within the plant?
   a) It has difficulty moving through the root
   b) It does not move up the stem
   c) It cannot be remobilized from old tissue
   d) It doesn’t move in the soil

14) A high humidity environment is important for propagation because:
   a) It provides more sunlight
   b) It provides more nutrients
   c) It decreases plant water loss
   d) It keeps the leaves dry

15) Plant cells are _____ which means they have the necessary genes to produce all the characteristics of plant.
   a) Differentiated
   b) Totipotent
   c) Replicated
   d) Divided

16) Which of the following is a list of plants that are classified as monocots?
   a) Elms, boxwood, oaks
   b) English ivy, roses, hollies
   c) Ginkgos, junipers, cedars
   d) Grasses, lilies, palm trees

17) Which part of the flower develops into the fruit?
   a) Anther
   b) Ovary
   c) Organelle
   d) Petiole

18) The process of breaking down molecules for plant maintenance and growth is known as_____.
   a) Photosynthesis
   b) Respiration
   c) Transpiration
   d) Evaporation
19) The process of harnessing the energy in light and converting carbon dioxide into sugar is known as_____.
   a) Photosynthesis
   b) Respiration
   c) Transpiration
   d) Evaporation

20) Which of the following characteristics of light can plants detect?
   a) Duration
   b) Quality
   c) Intensity
   d) All of the above