

# Develop Undergraduate Major Committee



BSPM Department Retreat

15 August 2018

CoBank Center

Agricultural Research, Development, and  
Education Center

Fort Collins, CO

# Mission of the Major

To understand the biology and ecology of pests and beneficial species

# Desired Features of the Major

Students want flexibility and to keep their options open

- Minimum credits to allow students to pursue additional interests and not close doors by choosing this major
- Self-designed concentration to allow flexibility

# Underlying Assumptions about the Major

- The major will train students broadly, not in specific areas such as entomology, plant pathology, or weed science.
- This broad training will provide the foundation for graduate or workplace training.
- Methods taught and information conveyed will be up-to-date and cutting edge
- \*Diverse groups and audiences include, but are not limited to, persons of different ages, educational, cultural, and experiential backgrounds, races, ethnicities, and sexual orientations.
- \*\* Sustainable means considering social, economic and biophysical aspects

# Student Learning Outcomes

# Technical Competencies

Students will:

- Be able to identify key pests and beneficial species in agricultural, horticultural, and natural systems through laboratory and field methods
- Explain the biology and ecology of pests and beneficial species
- Explain the benefits and risks of management practices in agricultural, horticultural, and natural systems
- Implement cost effective, socially acceptable, and environmentally sound pest management solutions

# Technical Competencies – Single SLO

- Integrate skills and knowledge to solve problems related to pests and beneficial organisms in agricultural, horticultural, and natural systems

# Agricultural Literacy

- Explain and assess pest management policy, including regulatory frameworks
- Demonstrate knowledge of the important participants in agriculture and natural resource management
- Describe the similarities and differences among management of biological problems in agricultural, horticultural, and rangeland settings
- Develop coherent, objective, balanced arguments regarding contemporary problems in agricultural, horticultural, and natural systems

# Agricultural Literacy – Single SLO

- Formulate coherent, objective, balanced arguments regarding management of biological problems in agricultural, horticultural, and natural systems



# Critical thinking

- Demonstrate ability to acquire knowledge about agricultural, horticultural, and natural systems and identify gaps and critical problems
- Integrate knowledge from across the curriculum
- Analyze qualitative and quantitative information and derive conclusions
- Synthesize knowledge to create novel ideas and solutions to complex problems

# Critical thinking – Single SLO

Describe, assess, analyze, and synthesize knowledge from across the curriculum to create solutions for pests and beneficial species in agricultural, horticultural, and natural systems.

# Leadership

- Function effectively within diverse teams to solve complex problems and achieve desired management outcomes in agricultural, horticultural, and natural systems
- Work to create and facilitate inclusive and diverse teams
- Promote and practice inclusion everywhere

# Leadership – Single SLO

Promote and practice inclusion to form effective teams that solve complex problems in agricultural, horticultural, and natural systems

# Communication

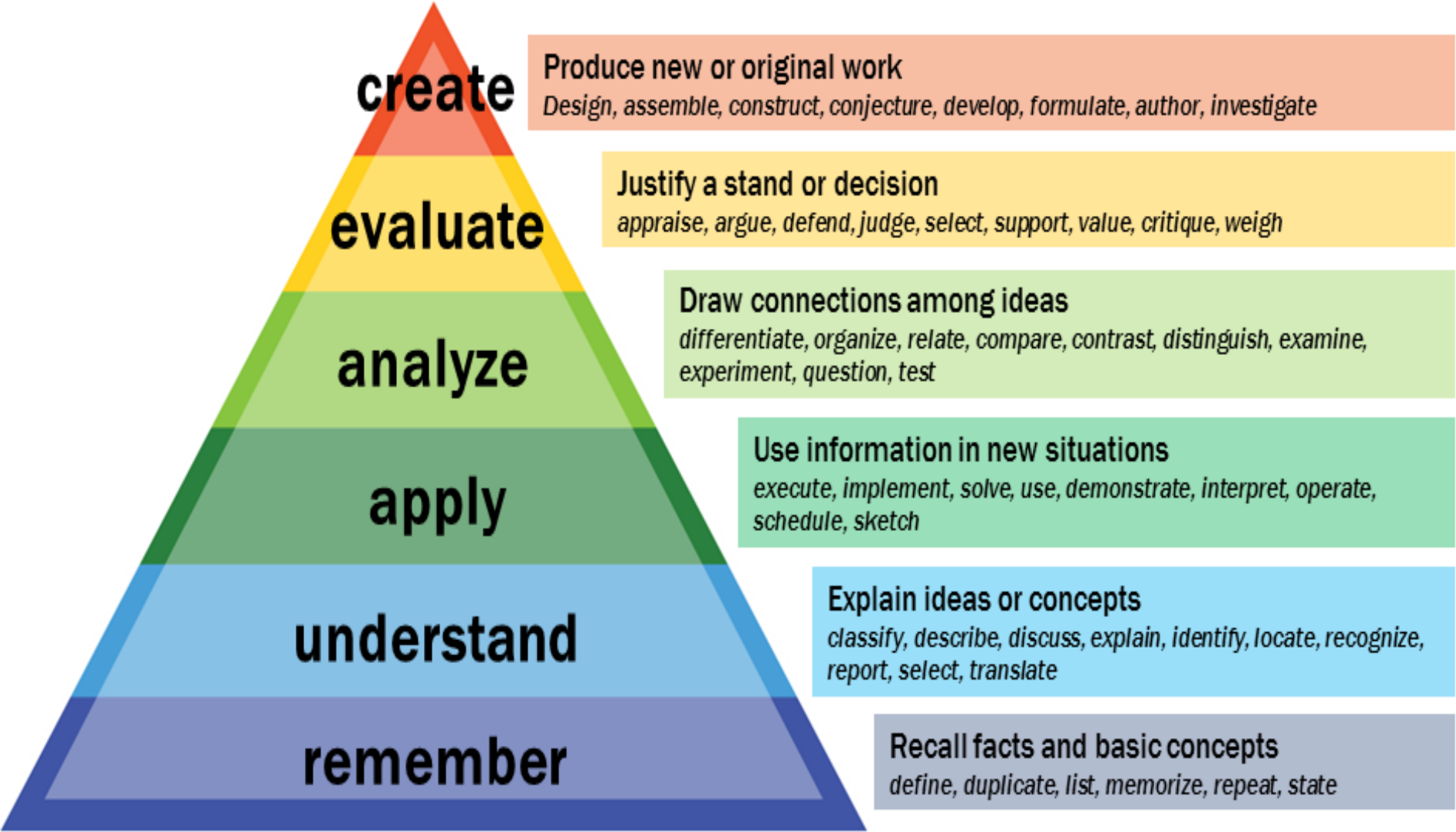
- Effectively communicate with broad and diverse\* audiences including peers, stakeholders, and the public.
- Demonstrate the ability to effectively engage stakeholders to identify management needs
- Provide information related to sustainable\*\* management in agricultural, horticultural and natural systems
- Excel in written and verbal communication of scientific results and analyses to diverse audiences\*

# Communication – Single SLO

Communicate effectively with broad and diverse audiences regarding sustainable management in agricultural, horticultural and natural systems



# Bloom's Taxonomy





## Action Verbs based on Bloom's Taxonomy

### Knowledge

define  
identify  
describe  
label  
list  
name  
state  
match  
recognize  
select  
examine  
locate  
memorize  
quote

### Understand

explain  
describe  
interpret  
paraphrase  
summarize  
classify  
compare  
differentiate  
discuss  
distinguish  
extend  
predict  
associate  
contrast

### Apply

solve  
apply  
illustrate  
modify  
use  
calculate  
change  
choose  
demonstrate  
discover  
experiment  
relate  
show  
sketch

### Analyze

analyze  
compare  
classify  
contrast  
distinguish  
infer  
separate  
explain  
select  
categorize  
connect  
differentiate  
discriminate  
divide

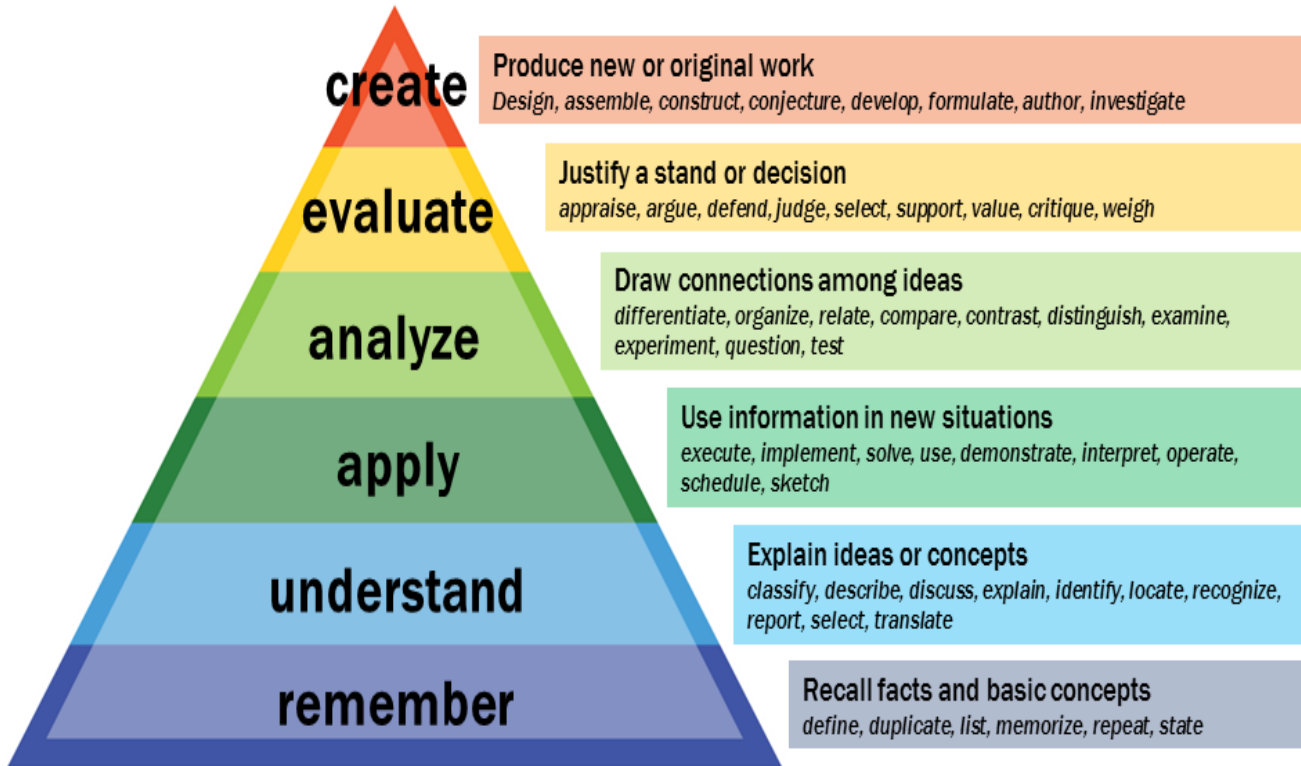
### Evaluate

reframe  
criticize  
evaluate  
order  
appraise  
judge  
support  
compare  
decide  
discriminate  
recommend  
summarize  
assess  
choose

### Create

design  
compose  
create  
plan  
combine  
formulate  
invent  
hypothesize  
substitute  
write  
compile  
construct  
develop  
generalize

# Bloom's Taxonomy



Vanderbilt University Center for Teaching

## Action Verbs based on Bloom's Taxonomy

| <u>Knowledge</u> | <u>Understand</u> | <u>Apply</u> | <u>Analyze</u> | <u>Evaluate</u> | <u>Create</u> |
|------------------|-------------------|--------------|----------------|-----------------|---------------|
| define           | explain           | solve        | analyze        | reframe         | design        |
| identify         | describe          | apply        | compare        | criticize       | compose       |
| describe         | interpret         | illustrate   | classify       | evaluate        | create        |
| label            | paraphrase        | modify       | contrast       | order           | plan          |
| list             | summarize         | use          | distinguish    | appraise        | combine       |
| name             | classify          | calculate    | infer          | judge           | formulate     |
| state            | compare           | change       | separate       | support         | invent        |
| match            | differentiate     | choose       | explain        | compare         | hypothesize   |
| recognize        | discuss           | demonstrate  | select         | decide          | substitute    |
| select           | distinguish       | discover     | categorize     | discriminate    | write         |
| examine          | extend            | experiment   | connect        | recommend       | compile       |
| locate           | predict           | relate       | differentiate  | summarize       | construct     |
| memorize         | associate         | show         | discriminate   | assess          | develop       |
| quote            | contrast          | sketch       | divide         | choose          | generalize    |



Retreat Input

# Mission

- To integrate and translate knowledge of the biology, ecology, and management of plants insects and microbes in agricultural and natural systems (Red Rage)
- To train leaders in the biology and ecology of pests and beneficial species in agricultural and natural ecosystems (Blue Thunder)
- Too broad (Green Tree Whisperers)
- Liked as is, but needs to be turned into something actionable such as to train students to solve problems (Green)
- Does this apply to urban systems, too?

# Features

- Blue Thunder
  - Generally good
  - Literacy is important
  - Better coordination among our own teaching to reinforce foundational lessons in later classes
- Green Tree Whisperers
  - Meet UCC requirements
  - Timing of courses must be complementary
  - Advising will be essential
  - Consider transfer student needs
  - Students will be able to complete the major in 4 years
  - Employability and preparation for graduate school
  - Practical, internship, real-world learning
  - Balance requirements with flexibility
- Red Rage
  - Core classes-Entomology, plant Path, microbiology, plant science
  - Change to allow to “to encourage”

# Assumptions

- Green Tree Whisperers
  - Practical training captured here
  - Soft skills, analytical and critical thinking are included in broad training
- Blue Thunder
  - How do students market themselves with this major?
  - Stay up to date
- Red Rage
  - The major will educate students broadly through training in entomology, plant pathology, and weed science and how they interact in agricultural and natural systems.

# Technical Competencies

- Improvements

- Natural and managed systems (houses, yards, etc. must be included)
- In horticultural, agricultural, and natural systems, Students what ... at top
- “Key pests” should be “important pests”
- Apply knowledge to integrate multiple methods to identify key pests... may not be able to identify to species, but know where to go to identify the organism.
- Remember we are training bachelors students
- Be able to apply current technologies to identify important pests. Delete through laboratory and field methods
- Current technologies as separate bullet: use current technologies to solve problems...
- Upgrade “explain” to “analyze” or “create”. Explain is rather low level on Bloom’s
- Move risk analysis to literacy
- Explain experimental design and hypothesis testing and interpretation to solve problems. Examples presented in class



# Agricultural Literacy

- Add Risk analysis
- Identify participants and demonstrate the importance of their roles in managed and natural systems.
- Combine first two bullet points into one
- Revise single SLO to address all Detailed SLOs
- Change coherent to logical or coherent AND logical

# Critical Thinking

- Remove Novel from the 4<sup>th</sup> bullet point

# Leadership

- 2<sup>nd</sup> and 3<sup>rd</sup> bullets are redundant
- Change 2<sup>nd</sup>: Create and facilitate inclusive and diverse teams
- 1<sup>st</sup> bullet: remove management
- Missing: Program will leadership opportunities
- Students who demonstrate leadership (learn by leading)
- Emphasize leadership at local and global levels

# Communication

- Broad and diverse redundant. Use diverse
- Include peers, stakeholders, the public, and the media
- Combine bullet 4 and 1



# Revised Undergraduate Major