

Develop Undergraduate Major Committee



Mugs Underground Lounge set up for DUMC retreat

Working Retreat

24 May 2018

Mugs Underground Lounge

Fort Collins, CO

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Frank Peairs, Jane Stewart

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

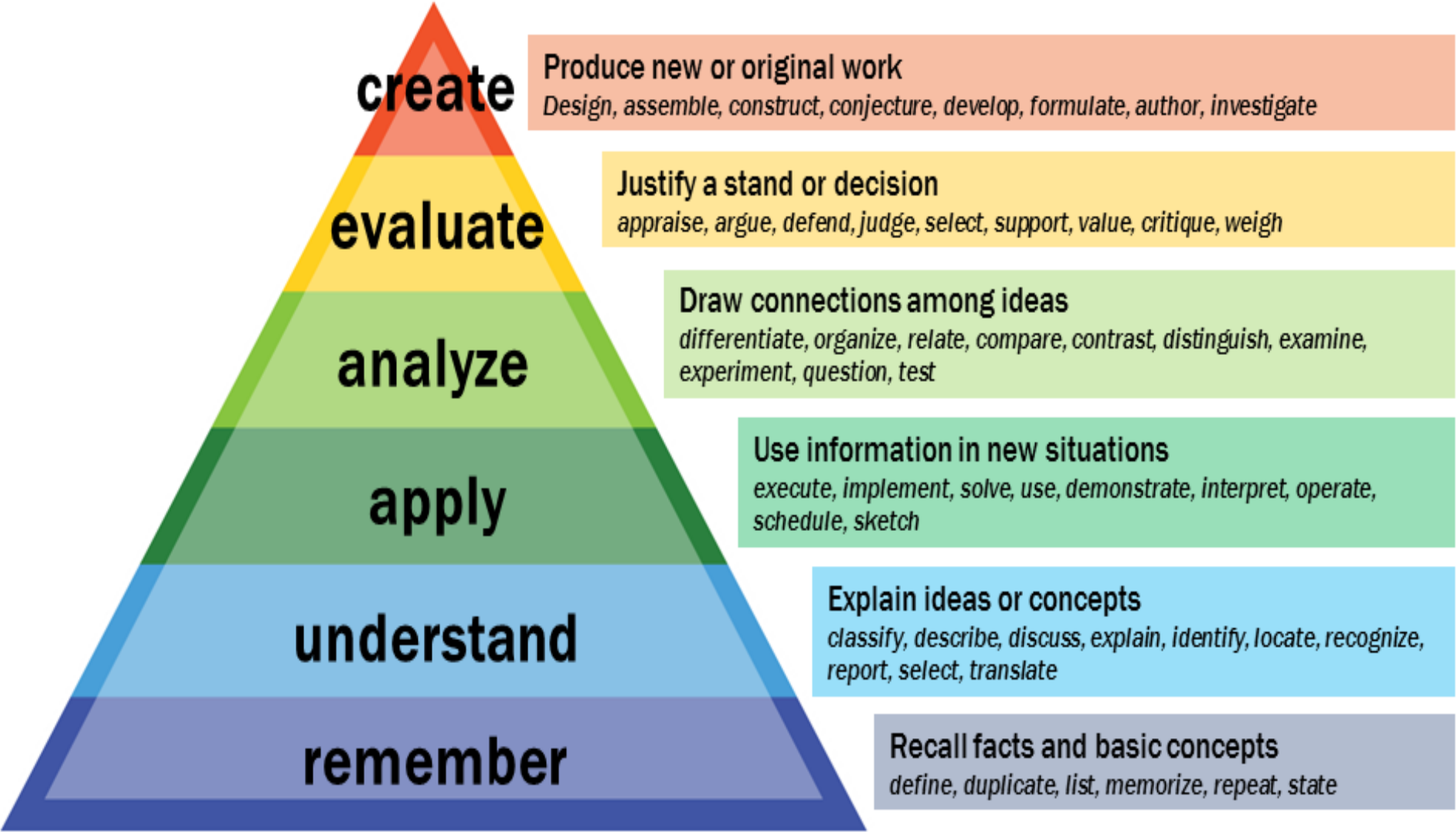
Communication

- 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

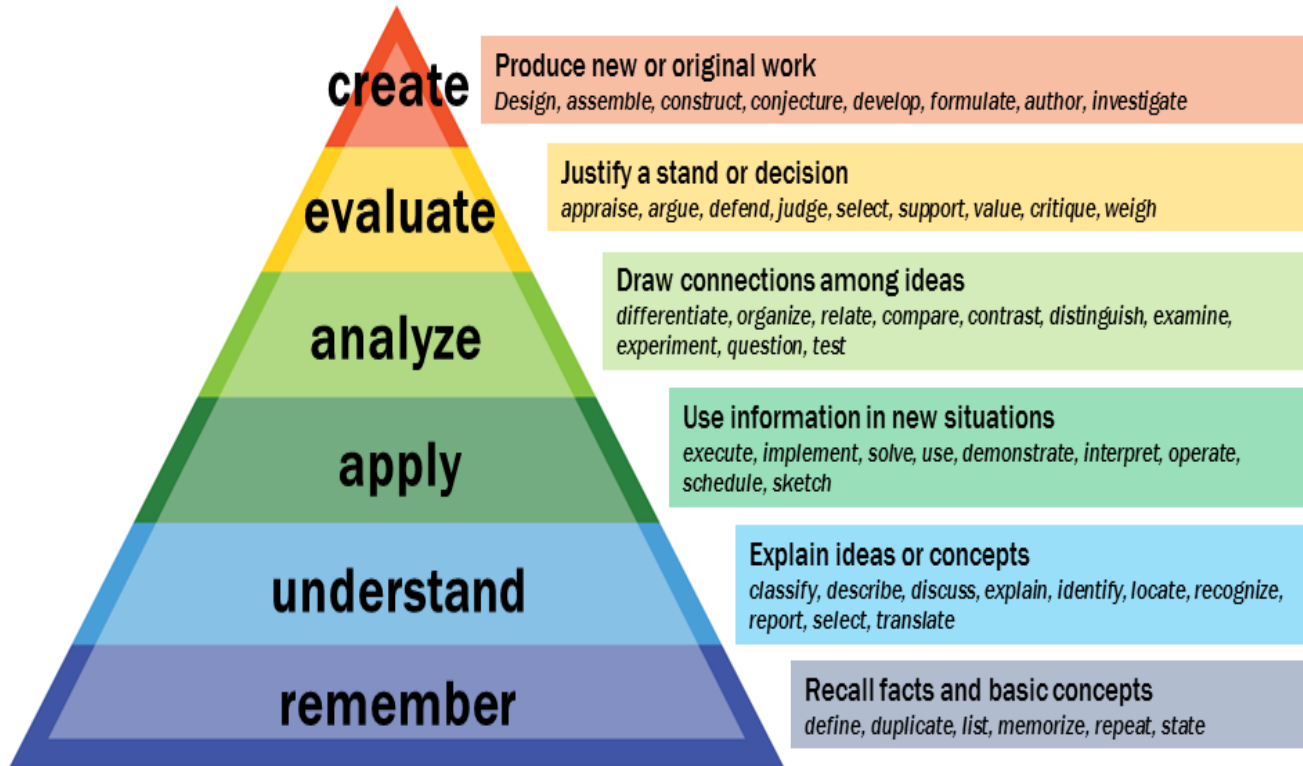
Evaluate

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 4th bullet point

Leadership

- 2nd and 3rd bullets are redundant
- Change 2nd: Create and facilitate inclusive and diverse teams
- 1st 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