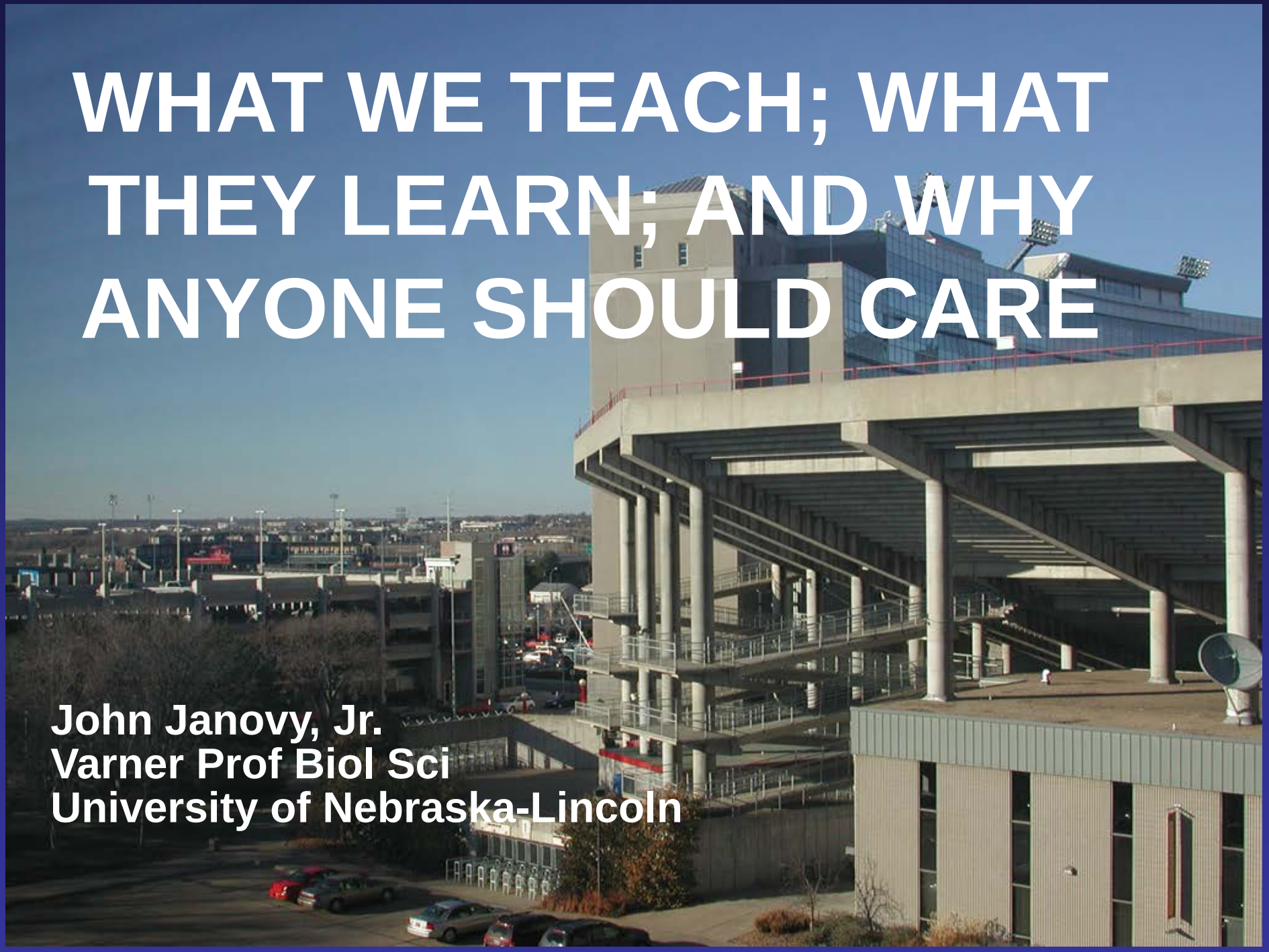
WHAT WE TEACH; WHAT THEY LEARN; AND WHY ANYONE SHOULD CARE



John Janovy, Jr.
Varner Prof Biol Sci
University of Nebraska-Lincoln

How do we turn this group of truly wonderful people into skilled writers, critical thinkers, and habitually analytical citizens with a true understanding of the arts, humanities, social sciences, and sciences?

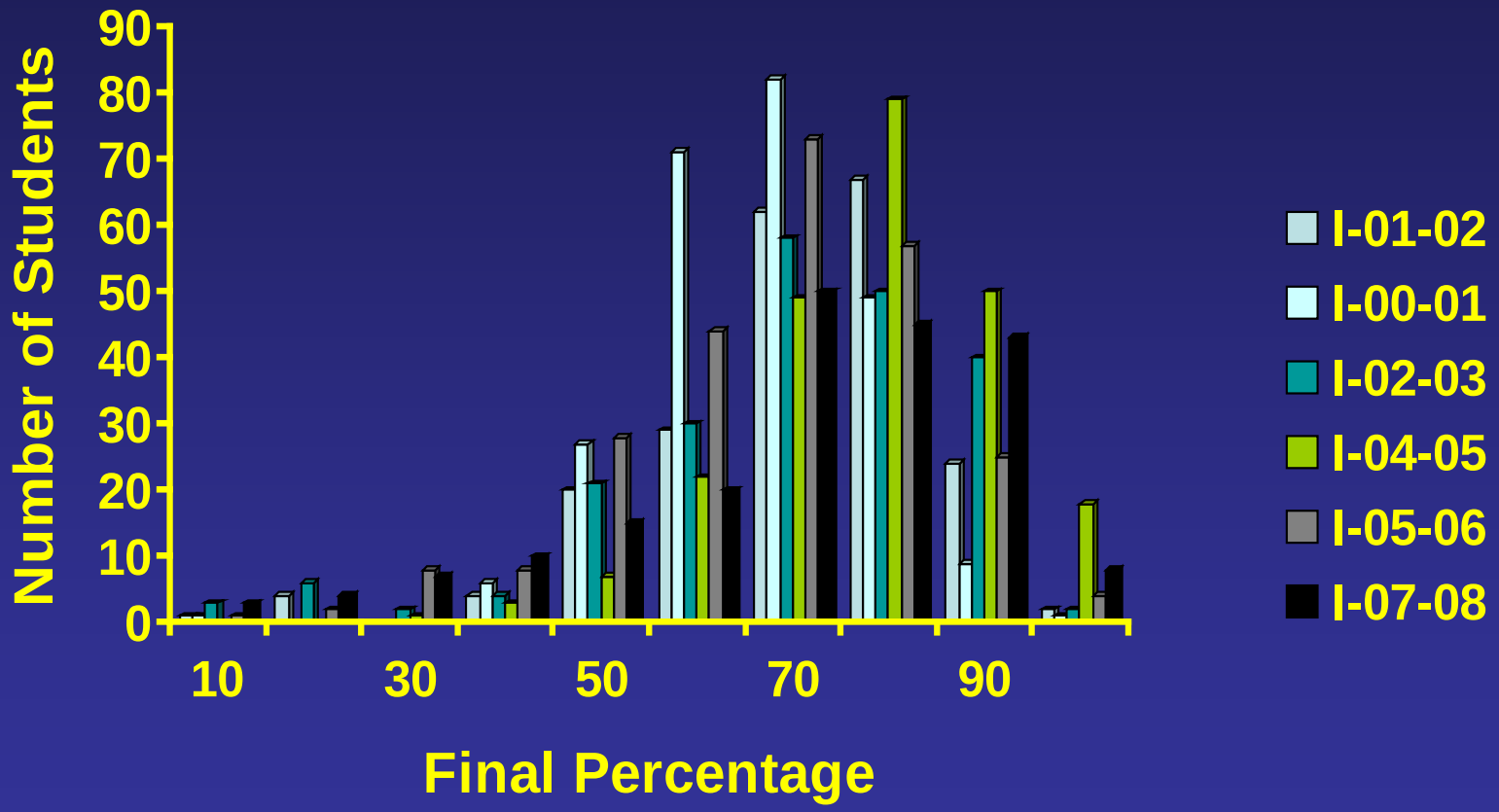
What you see from the front of a large freshman classroom over a 40-year period.

- Success
- Failure
- Romance
- 10,000+ future citizens
- Kids who will be doctors that operate on your own children
- A microcosm of our evolving nation


Romance:
Mary Ann McDowell (from Kearney), PhD, Prof Biol at Notre Dame, UNL alum
Mike Ferdig (from Bennington), PhD, Prof Biol at Notre Dame, UNL alum
Sam and Georgia, their kids, getting taken to where Mike and Mary Ann did their research at UNL's Cedar Point Biological Station

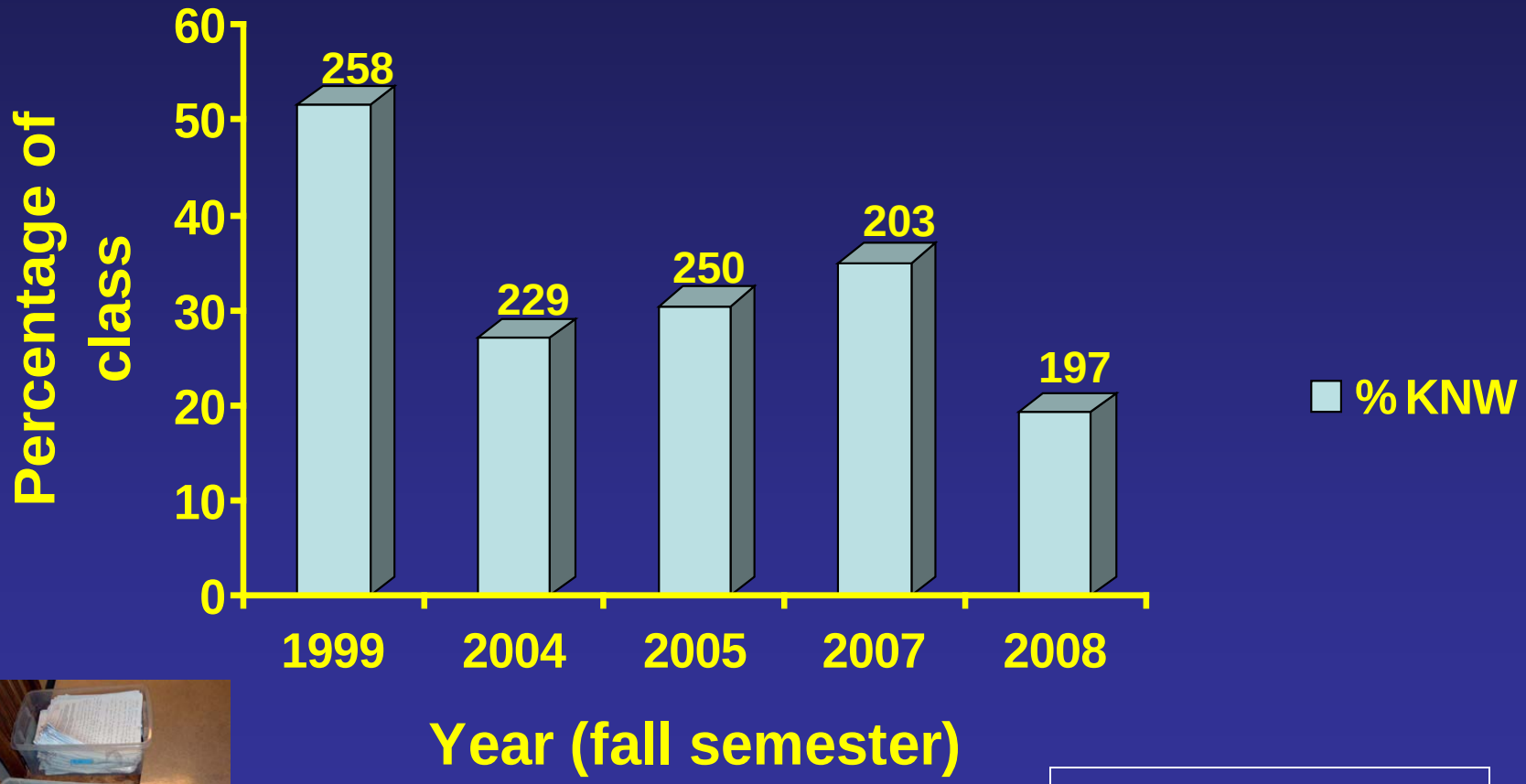
A portrait of my evolving nation as seen from the podium:

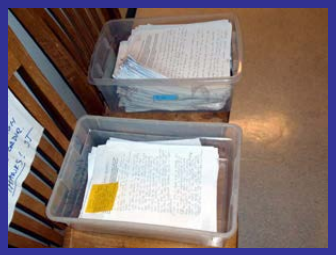
Frequency distribution of grades in a sample of JJ's BS101 classes:



A portrait of my evolving nation as seen from the podium (cont'd):

Percentage of students recognized outside of class by the end of October:





Syllabus info sheet

Message from the podium:

- They're not their parents' freshmen.
- Even if you give them all the questions in advance, their (collective) grades don't change.
- Something's going on in this large auditorium setting that we don't really understand.
- My colleagues blame the information age culture.

The factors at work:

- Heterogeneity in the student population
- Complexity of the institution
- Information age culture

Heterogeneity in the student population:

- Economic diversity
- Religious diversity
- Family history
- Employment
- Military service
- Major; career goals
- Co-curricular activities
- Ethnic background
- Gender
- Advice from high school
- Appearance
- Talents
- Drug and alcohol use
- Significant others
- Sexual orientation
- Age and maturity
- Reading skills
- Attention span

Complexity of the institution:

- Eight undergraduate colleges
- Eight different cultures
- Eight different governance practices
- Eight different budgets
- Eight different alumni engagements
- Eight different . . . (this list goes on for a while).

Information age culture (hourly lives of students):

- iPods*
- Podcasting*
- Cell phones*
- Text messages
- Ring tones
- WWW*
- Blackboard*
- Free downloads*
- E-mail*
- Digital images*
- YouTube/MySpace
- Electronic library access*
- Sound bite reporting
- Political stridency
- PowerPoint*
- Tsunami*
- Video games
- Classroom Response Systems*

* = JJ uses regularly

Globalization in a freshman biology class

(languages spoken or studied for more than a year by my 2007 BIOS 101 students):

- Spanish*
- French*
- German*
- Tamil
- Persian
- Arabic
- Norwegian
- Chinese
- Japanese
- Lakota
- ASL
- Hindi
- Gujarati

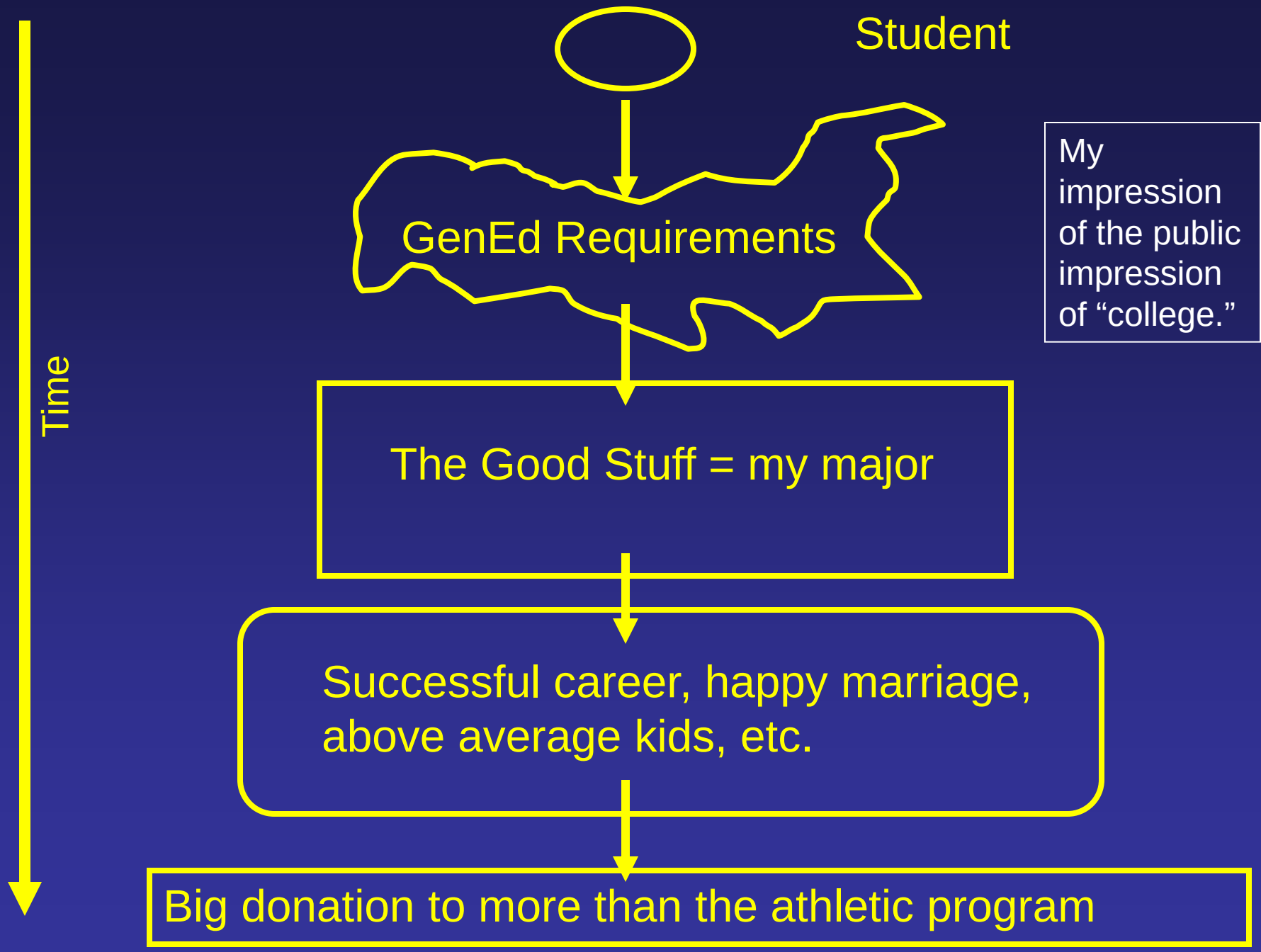
* - JJ has studied for more than a year.

Globalization in a freshman biology class (countries visited by my 2007 BIOS 101 students):

- Australia
- Austria
- Belgium
- Belize
- Bosnia
- Brazil
- Canada
- Caribbean (several)
- China
- Costa Rica
- Croatia
- Czech Republic
- Denmark
- France
- Germany
- Greece
- Guatemala
- Honduras
- Hungary
- Iceland
- India
- Iran

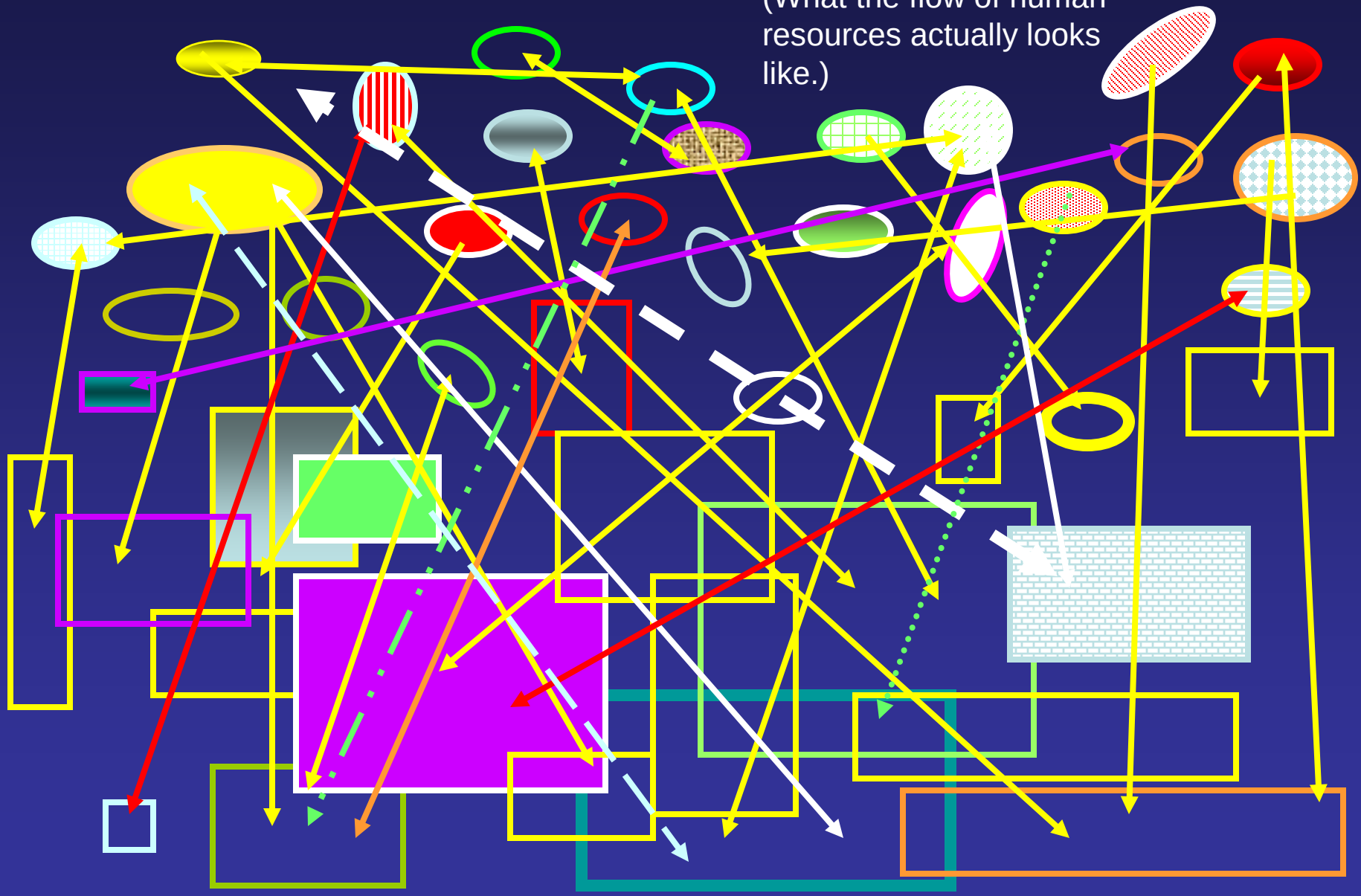
Globalization in a freshman biology class (countries visited – cont'd):

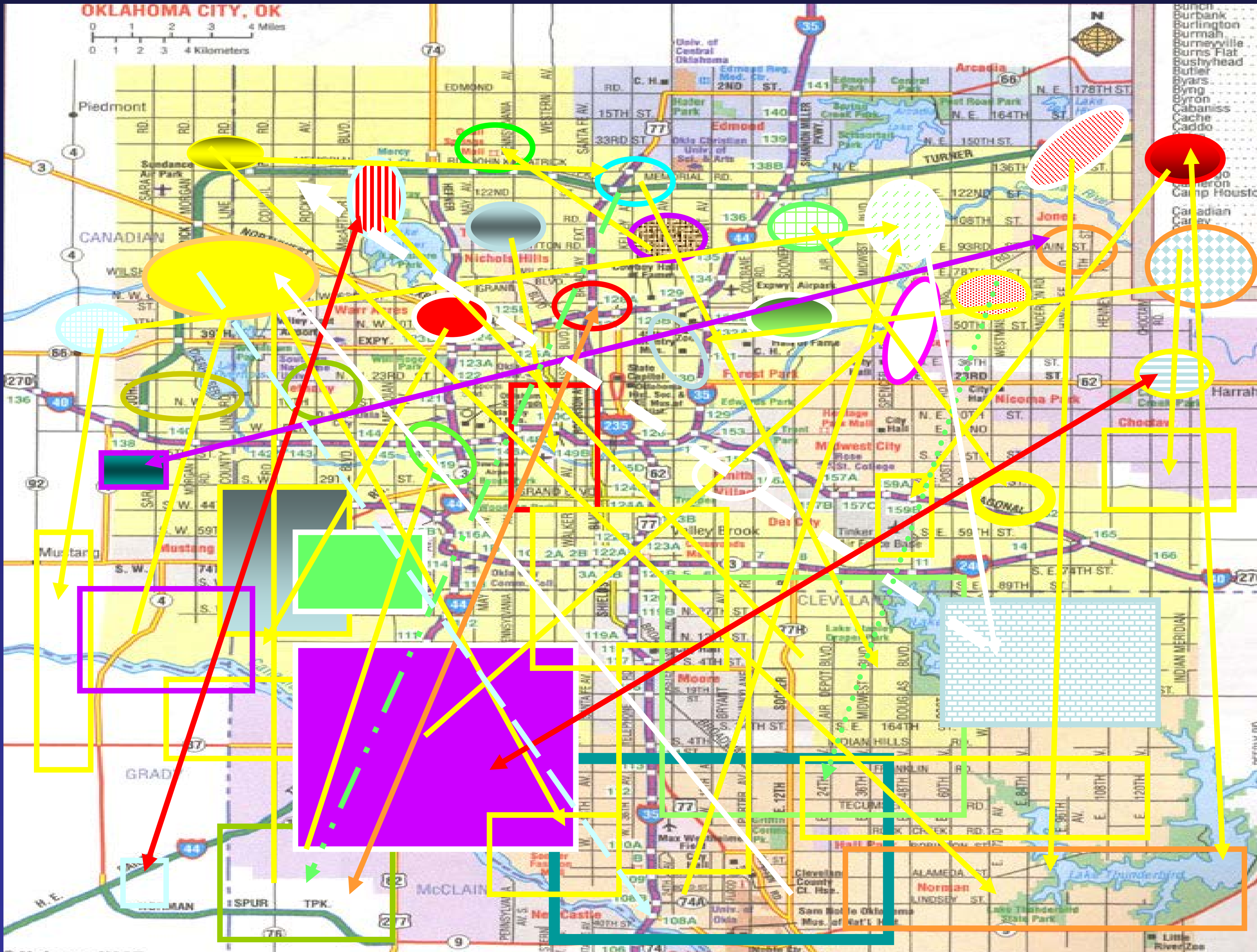
- Ireland
- Italy
- Japan
- Kenya
- Lithuania
- Lichtenstein
- Luxemberg
- Malta
- Mexico
- Monaco
- Netherlands
- Pakistan
- Philipines
- Poland
- Portugal
- Puerto Rico
- Russia
- Saudi Arabia
- Spain
- Sudan
- Switzerland
- Taiwan
- Thailand
- Turkey
- UK
- Venezuela


Student
GenEd Requirements
My impression of the public impression of “college.”
Time
The Good Stuff = my major
Successful career, happy marriage, above average kids, etc.
Big donation to more than the athletic program

= Students = opportunities = interactions

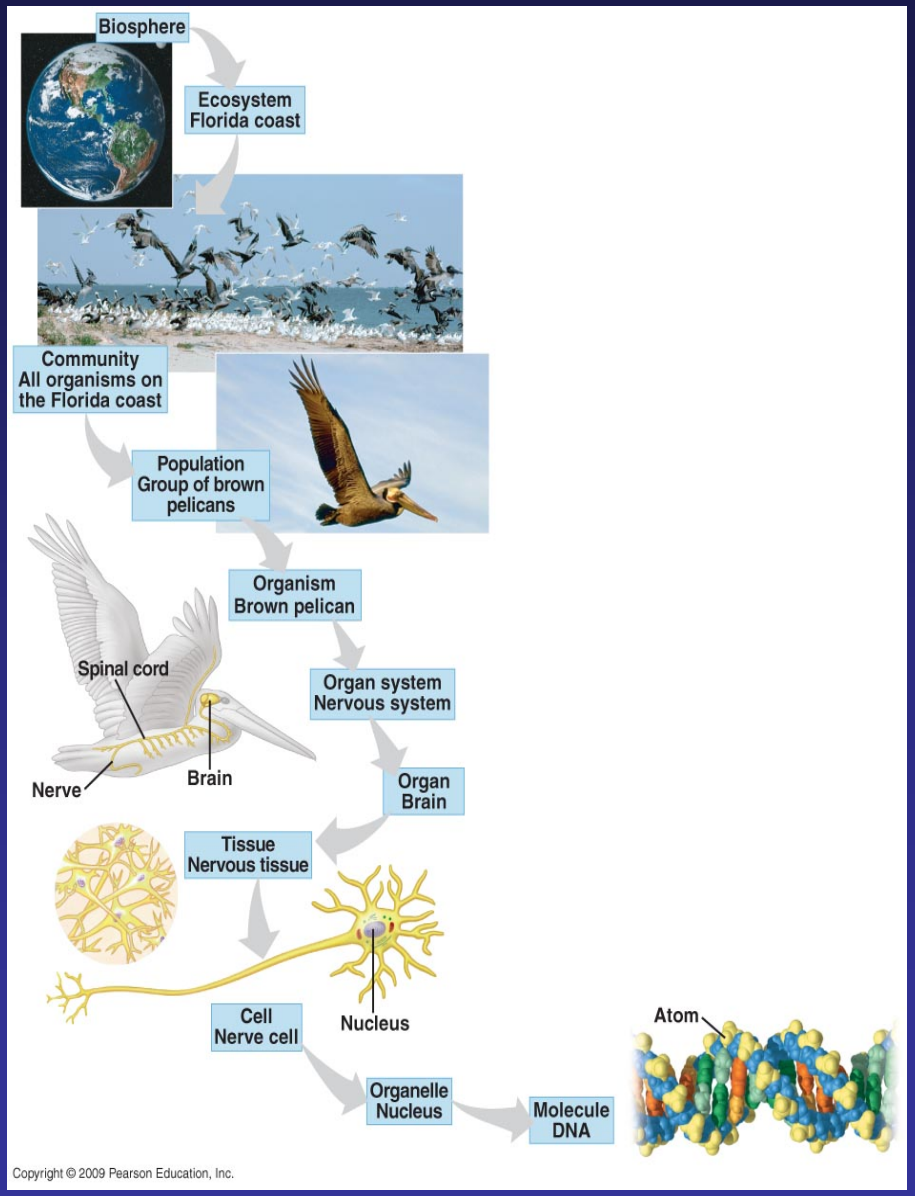
(What the flow of human resources actually looks like.)




OKLAHOMA CITY, OK
0 1 2 3 4 Miles
0 1 2 3 4 Kilometers
Piedmont
CANADIAN
Sundance Air Park
EDMOND
Edmond
Univ. of Central Oklahoma
Edmond Reg. Med. Ctr.
Arcadia
Jones
Harrah
Choctaw
Nichols Hills
Warr Acres
Bethany
Forest Park
Nicoma Park
Midwest City
Del City
Spencer
Valley Brook
CLEVELAND
Moore
Mustang
GRADY
McCLAIN
Norman
Lake Thunderbird
Lake Thunderbird State Park
Newcastle
Max Westheimer Field
Tinker Air Force Base
State Capitol
Heritage Park Mall
TURNER
TPK.
Oklahoma City Comm. Coll.
Cleveland County Ct. Hse.
Univ. of Okla.
Sam Noble Oklahoma Mus. of Nat'l. Hist.
Little River Zoo
INDIAN MERIDIAN
Burbank
Burlington
Burmah
Burneyville
Burns Flat
Bushyhead
Butler
Byars
Byng
Byron
Cabaniss
Cache
Caddo
Cameron
Camp Houston
Canadian
Carney
© UniversalMAP

What we teach:

- The nature of science
- Baby biochemistry
- Cell structure and function
- Mendelian genetics
- Evolution
- Ecology (nutrient cycling)



What they learn:

- Time management
- Time management
- Time management
- CMS use
- Laundry techniques
- Local establishment characteristics
- Where the quiet places are
- How to get certified for something

100889	87.5	69.1	4.0
233422	75.0	35.8	0.0
XS2910	52.5	51.2	4.0
234561	87.5	79.4	3.0

What does my evolving nation need?

- Transferable skills
- Ability to work with diverse individuals
- An ability to produce something
- Flexibility, adaptability, global awareness
- Analytical habits of mind
- Reduced fear of the unknown (arts, science)
- A vital interest in life-long learning

(These attributes are independent of content or subject matter, although the content is the vehicle by which the attributes are “taught.”)

How do you make this group of wonderful young people behave in a scholarly way?

Treat ‘em like they’d get treated over in the athletic department?

Grading in BIOS 101 I-08-09:

- Hour exams; 3 @ 100 pts each 300
- Final exam; 1 @ 160 points 160
- Friday writings; 14 @ 10 points 140
- Attendance 100

TOTAL **700**

Portfolio bonus 50

Grading in BIOS 101 I-08-09:

• Hour exams; 3 @ 100 pts each	300
• Final exam; 1 @ 160 points	160
• Friday writings; 14 @ 10 points	140
• Attendance	100
TOTAL	**700**
Portfolio bonus	50

= Behavior modification “opportunities”

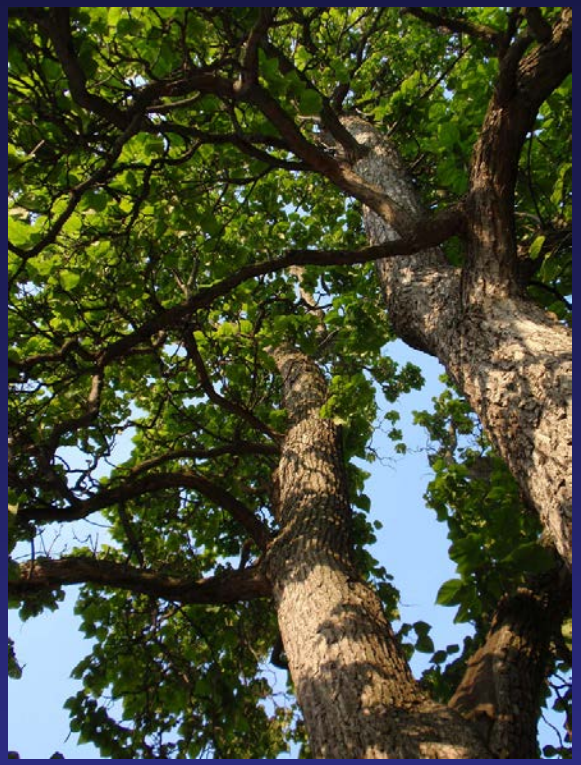
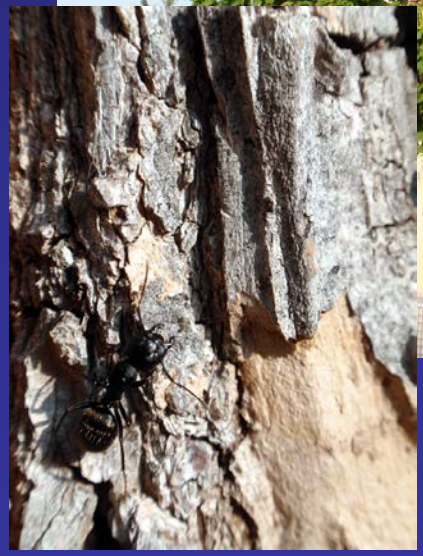
Move your chosen tree to a new location on campus, telling:

(1) Why you chose the new location;

(2) What you hope to accomplish by this move; and,

(3) What the long-term effect of this move will be.



Junk food from Richards Hall vending machine

Vocabulary words used regularly in the next two weeks of class.

Explain this label to your grandparents.

Red Grooms *The Unicorn Strikes Back* (detail), 2006, oil on canvas, 96 x 96 in., 243.8 x 243.8 cm

Interpret this picture in terms of all the eco-system energy and carbon skeleton flow we have discussed in the last week, using at least 15 different participants.

Red Grooms *The Unicorn Strikes Back* (detail), 2006, oil on canvas, 96 x 96 in., 243.8 x 243.8 cm

Interpret this picture in terms of all the force topics and equations we have discussed in the last week, using at least 15 different participants.

Red Grooms *The Unicorn Strikes Back* (detail), 2006, oil on canvas, 96 x 96 in., 243.8 x 243.8 cm

Interpret this picture in terms of all the crystal structure and rock formation mechanisms we have discussed in the past two weeks.

Red Grooms *The Unicorn Strikes Back* (detail), 2006, oil on canvas, 96 x 96 in., 243.8 x 243.8 cm

Interpret this picture in terms of all the chemical compounds we have discussed so far this semester.

3+7=10

BIOS 101 I-07-08 101207 Extemporaneous writing Name__
Clicker ID

Interpret this picture in terms of the carbon, nitrogen, and energy flow we have studied for the past two weeks. Include at least 15 participants.

In this picture there is a lot going on. Apart from the obvious abuse of the color yellow, there actually is a lot of biology taking place. First, if you look at the plants, you know that the plants are getting energy from the sun. To this the plants are eaten by the horse & even the angry unicorn. The plants then are providing potential energy & useable energy to the herbivores that are eating it. The plants also have been giving off oxygen to the animals & humans in this picture. The humans then are taking the oxygen from the plants & returning the favor with carbon dioxide. The animals are breaking down the plants & they are using it for energy. The angry unicorn, who may be eating the dog that is on top of it & the humans it is attacking is burning/spending lots of energy as it is violently attacking the rest of the species in the picture. The fairy looking princess in the castle is also burning energy & is using the oxygen from the plants. The ducks/geese in the moat are eating the plants in the water & they are gaining energy, energy that they will then pass to the humans when they have a feast after the angry unicorn is defeated.

Extemporaneous Writing

10/12/07

In this picture there is a lot going on. Apart from the obvious abuse of the color yellow, there actually is a lot of biology taking place. First, if you look at the plants, you know that the plants are getting energy from the sun. To this the plants are eaten by the horse and even the angry unicorn. The plants they are providing potential energy and useable energy to the herbivores that are eating it. The plants also have been giving off oxygen to the plants animals and humans in this picture. The humans then are taking the oxygen from the plants and returning the favor with carbon dioxide. The animals are breaking down the plants and they are using it for energy. The angry unicorn who may be eating the dog that is on top of it, and the humans it is attacking is burning or spending energy as it is violently attacking the rest of the species in the picture. The fairy looking princess in the castle is also burning energy and is using the oxygen from the plants. The ducks/geese in the moat are eating the plants in the water and they are gaining energy – energy that they will then pass to the humans when they have a feast after the angry unicorn is defeated.

Extemporaneous Writing

10/12/07

For this extemporaneous writing I thought that I did a good job of describing what was going on in the picture. The picture was very busy and it was hard to tell what exactly was going on with the animals and the humans. I think that I did a good job of describing the picture the best that I could. I do not know if I did a good job of describing what happened in the picture because there were so many things going on. It was hard to pick out certain things that happened in the picture because there were so many things to choose from.

I decided to put in a lot of information about the unicorn because I felt like he was an extremely important part of the picture. Without the angry unicorn there would be no point in the picture, so I decided to give him the main part of my extemporaneous writing. I think that I did a good job of explaining what the unicorn's body and cells were doing as he was angrily attacking the other participants in the picture. I wanted to make sure that I also included the importance of the plants that are in the picture. The plants are essentially providing the energy for the unicorn as it is giving him energy as a food source and oxygen for him to breathe. Without the plants in the picture or in my extemporaneous writing the humans and the animals would cease to exist. I think that the plants and the unicorn play an integral role in the livelihood of society and the mere existence of the humans.

good

Overall I think that I did a good job of interpreting this picture even though there was so much going on in the picture. It was somewhat fun to be able to look at these pictures and pick out what is going on biologically in the characters and the other participants in the pictures.

Questions, anyone?

Questions??