


Engaging non-scientists in science general education classes



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Workshop overview

- Introductions
- Why GE???
- Why include science in GE?
- Science GE vs. science in major
- The opportunities that come with teaching science GE
- Questions and discussion

Why have general education programmes?



One minute

Share with your neighbours

Five outcomes for general education

- ❖ strong analytical, communication, quantitative, and information skills
- ❖ deep understanding of and hands-on experience with the inquiry practices of disciplines that explore the natural, social, and cultural realms
- ❖ intercultural knowledge and collaborative problem-solving skills
- ❖ a proactive sense of responsibility for individual, civic, and social choices
- ❖ habits of mind that foster integrative thinking and the ability to transfer skills and knowledge from one setting to another

AAC&U Essential Learning Outcomes

- ***Knowledge of Human Cultures and the Physical and Natural World***

Focused on engagement with big questions, enduring and contemporary

- ***Intellectual and Practical Skills***

Practiced extensively across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance

- ***Personal and Social Responsibility***

Anchored through active involvement with diverse communities and real-world challenges

- ***Integrative and Applied Learning***

Demonstrated through the application of knowledge, skills, and responsibilities to new settings and complex problems

GE courses

- Have to deliver these outcomes
- There are virtually unlimited ways of doing this
- Enormous flexibility in what we teach
- Great potential for doing what interests us

GE is not

- ❑ Something to be gotten out of the way
- ❑ Easy
- ❑ Boring
- ❑ Secondary to the major

Why should science be a part of GE?

- More than breadth
- What is important about your discipline?
- What are the benefits of science literacy?
- What are the appropriate learning outcomes for science GE courses?

Differentiating between General Education and Major Subjects

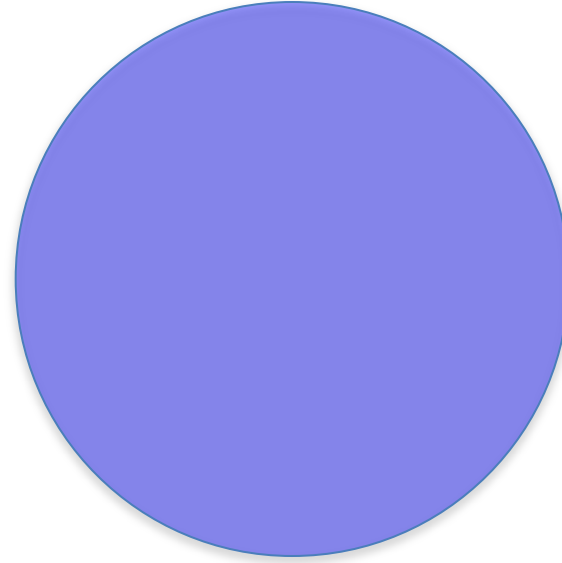
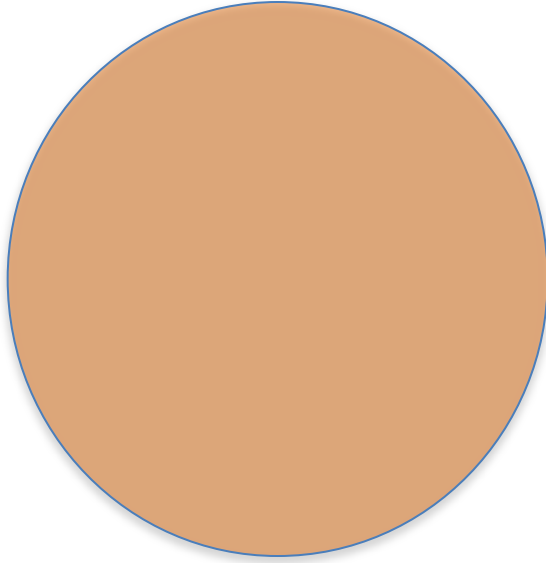
Does this course represent

- the last science course a student ever takes
- the beginning of a lifetime of study in this discipline

How does that affect what is taught?

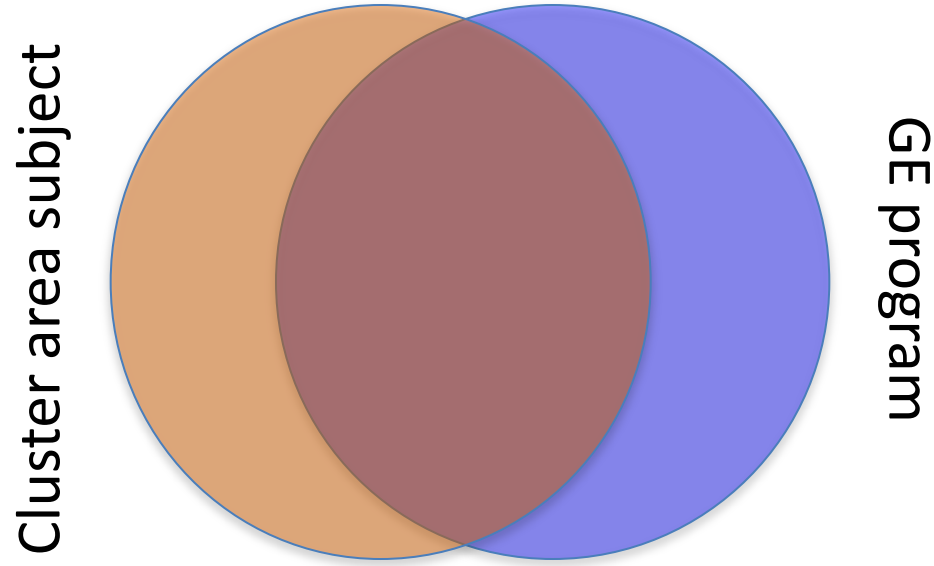
General education learning outcomes

Cluster area subject



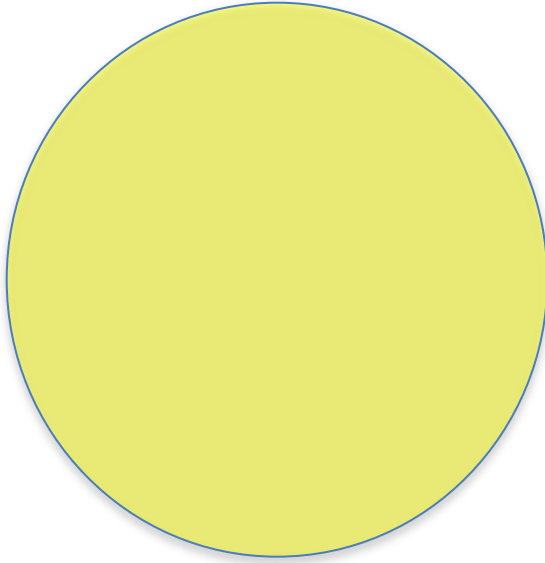
GE program

General education learning outcomes

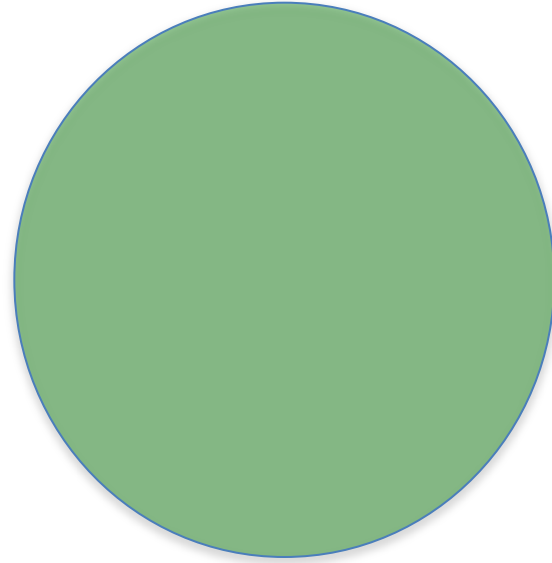


Learning outcomes within the major

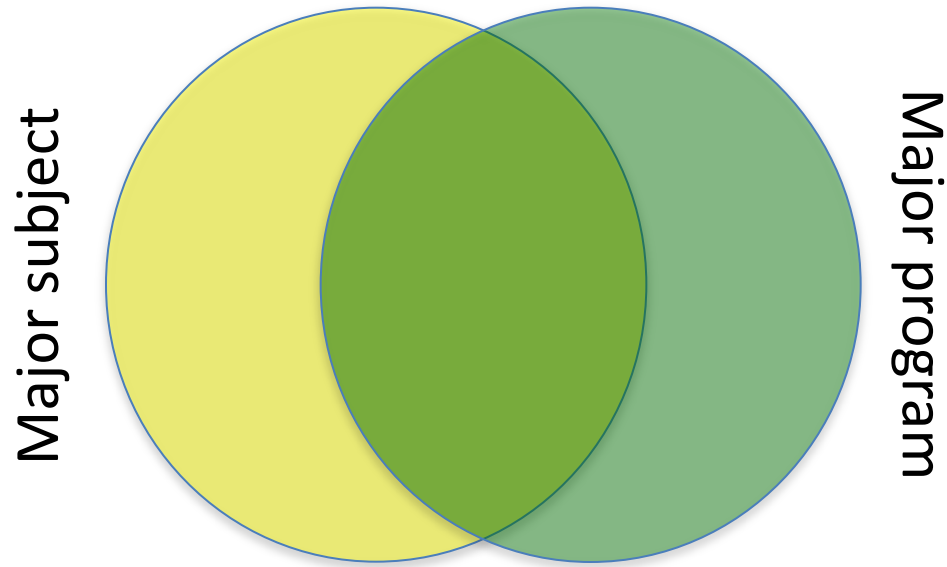
Major subject



Major program

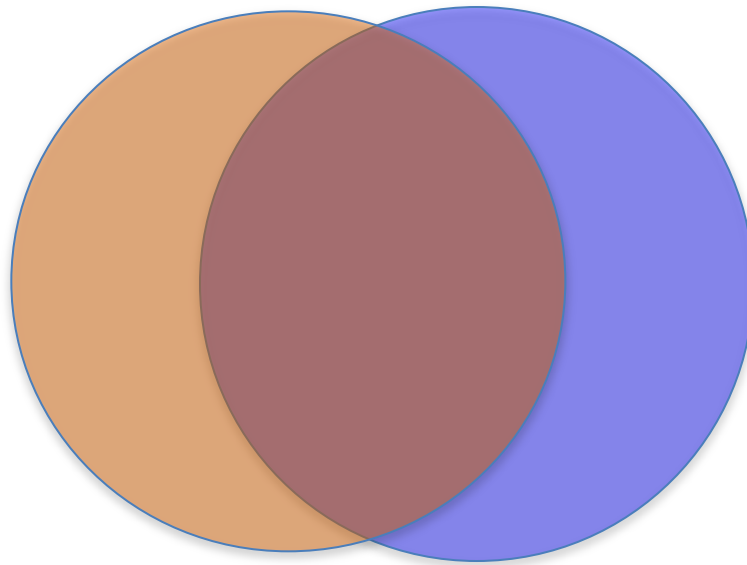


Learning outcomes within the major

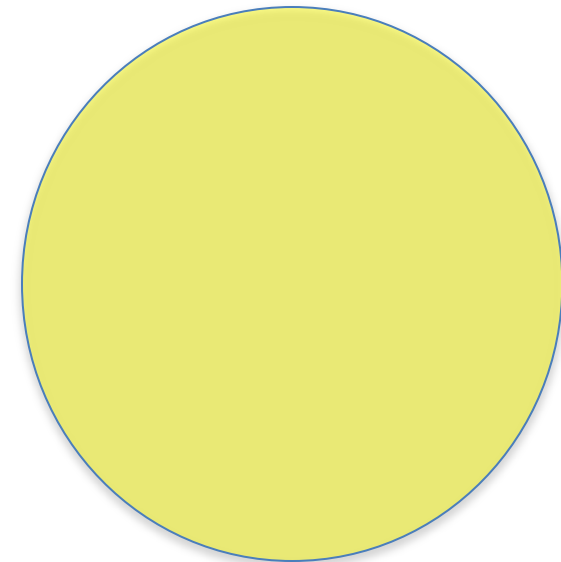


Differentiating between General Education and Major Subjects

Cluster area subject

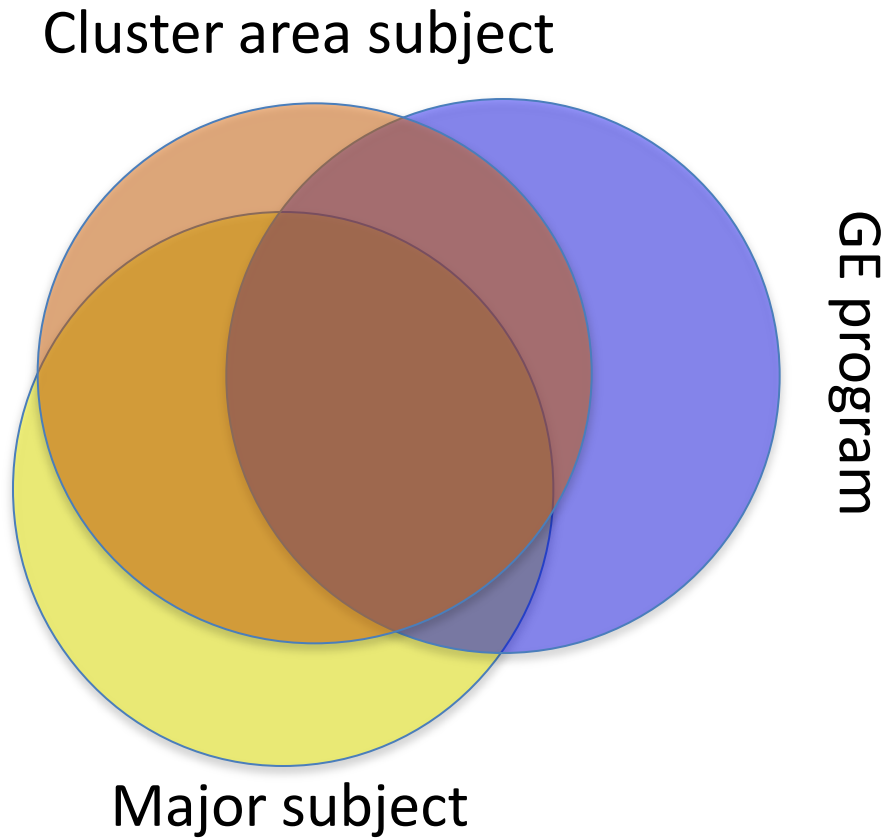


GE program

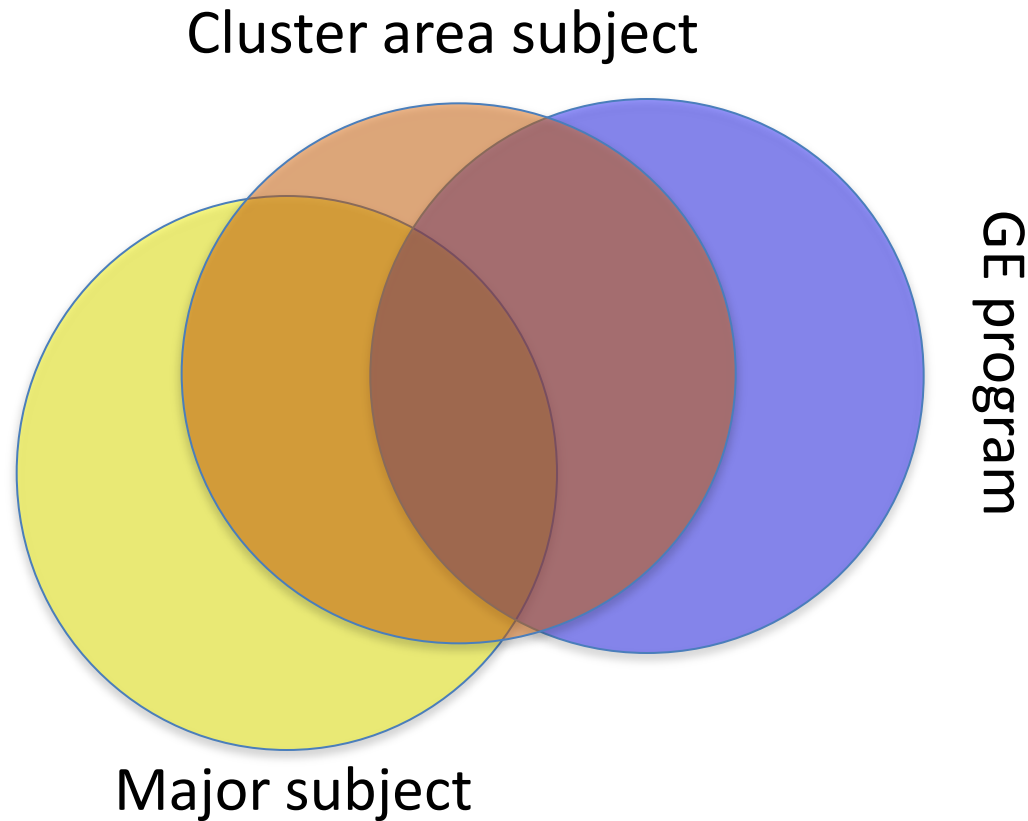


Major subject

Differentiating between General Education and Major Subjects



Differentiating between General Education and Major Subjects



Differentiating General Education and Major Subjects

- ❑ Major subjects and general education subjects represent overlapping rather than dichotomous worlds
- ❑ The degree of difference depends on how both programs are defined

What are the appropriate learning outcomes for science GE courses?



GE Scientific Reasoning Outcomes

- ❑ Explain the methods of scientific inquiry that lead to the acquisition of knowledge. Such methods include observations, testable hypotheses, logical inferences, experimental design, data acquisition, interpretation, and reproducible outcomes.
- ❑ Apply scientific methods to investigate real-world phenomena, and routine and novel problems. This includes data acquisition and evaluation, and prediction.
- ❑ Represent scientific data symbolically, graphically, numerically, and verbally.
- ❑ Interpret scientific information and draw logical references from representations such as formulas, equations, graphs, tables and schematics.
- ❑ Evaluate the results obtained from scientific methods for accuracy and/or reasonableness.

Differentiating General Education and Major Subjects

- ❑ The last science course
- ❑ A prerequisite for life and engaged citizenship
- ❑ Need to connect to other disciplines
- ❑ There are enormous problems associated with teaching foundational science subjects
- ❑ Good teaching is good teaching


Requisites for good science teaching

- ❑ Need to connect to students' own lives
- ❑ Need to connect to important issues
- ❑ Need to go beyond the facts
- ❑ Start with problems/questions

Teaching what excites you

- ❑ General education is a great opportunity for teachers
- ❑ Freedom from disciplinary and major program constraints
- ❑ Opportunities for interdisciplinary approaches and team teaching
- ❑ You can take the initiative
- ❑ Clear benefits for administrators and students

What got you excited about science?



One minute

Share it with your group in one sentence

Maybe what excites you will excite

your students

What is your dream course?

One minute

Share with your group

Choose one course

Remember, it must be

- ❑ Aligned with GE goals
- ❑ Aligned with cluster area goals

- ❑ Select a learning outcome
- ❑ List the learning activities
- ❑ Be innovative

Innovative science GE courses

Questions and discussion

