



Communicating Science

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A decorative graphic of a feather, rendered in a light beige color, is positioned on the left side of the slide. It has a central rachis with numerous barbs extending outwards, creating a fan-like shape. The feather is oriented vertically, pointing downwards.

Today we see an overview

- Philosophy of communication
- Types of communication
- Fundamentals of each communication venue
- Ample time for discussion and questions and ideas



These folks are not
communicating like
scientists


"I dominate the ball / game"











CONTENT, COMMUNICATION, AND RECEPTION. Those are the three elements that go into a performance; but unless they are in total alignment, there will be no magic.

The first part, content, is what you think of as the voice of the composer, the reason why the music was written, why it's meaningful. In the second part, communication, the content is translated for the listener, and to do that, you have to be able to use your brain, your body, and your technique, because there must be no impediment between content and communication. The third part, reception, is often forgotten but it's perhaps the most important, for there will be no magic unless what you think of as the content is actually received by the listener. If it isn't, then something went awry, something was not clear, there was an impediment in the communication.

-- Yo-Yo Ma



The purpose of scientific communication is to enable your data to steal the show.





Avenues for communication

- Written communication
 - Scientific proposal (e.g., NSF, candidacy, funding agency)
 - Journal article
 - Research poster
- Oral communication
 - Short conference presentation
 - Job talk
 - Teaching



Written communication: rules

- Every paragraph focuses on one coherent idea
- Each paragraph begins with a topic sentence about that idea
- Grammar, spelling and punctuation are important
- Avoid unnecessary meta-discourse
- Transitions between paragraphs are not necessary
- Logical flow between paragraphs is necessary

“my library books are due tomorrow”

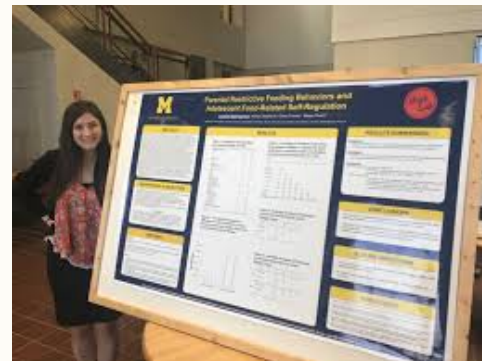


Written communication: the proposal / journal article

- A format exists already
- Be creative in your interpretations, not your presentation
- Each figure really is worth 1000 words
 - Learn to describe data in words and visually
 - Readers are all from Missouri
- Contextualize your work

Professional meeting presentations

- It's all about you
 - Nervous (self-doubt, pressure for job, hate your science)
 - Overwhelmed (so many people, so many presentations)
 - Exhausted (jet lag, nerves, overload, late nights out)





Professional meeting presentations

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- It's not at all about you

- Nervous (self-doubt, pressure for job, hate their science)
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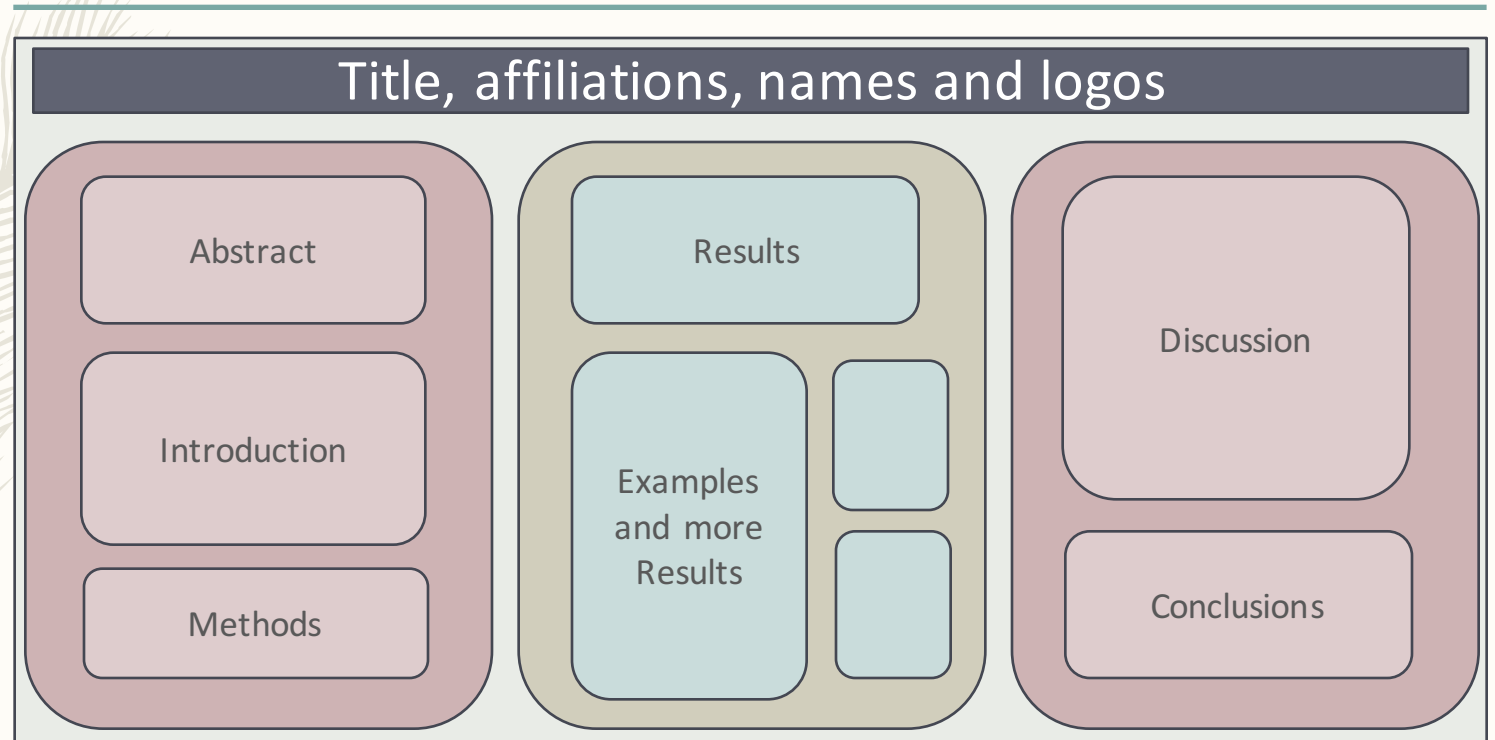




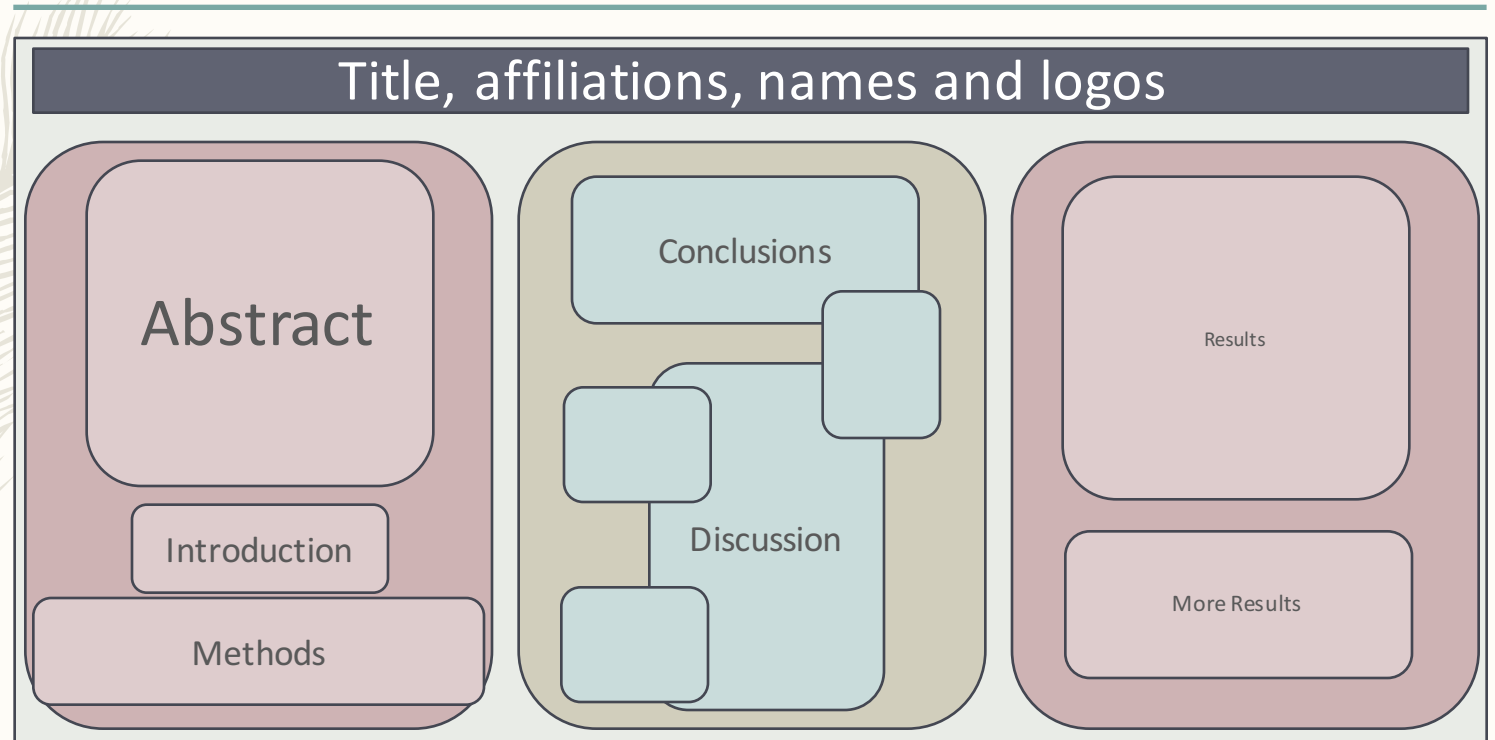
Oral Communication: posters (advice from GSA)

- Be organized
- Avoid clutter
- Be direct and concise (most people spend between 3-5 min.)
- Choose appropriate fonts at an appropriate size
- Keep the color scheme simple
- Balance the text with the images
- Stand to the side and face into the room
- Be there to promote your work
- Be prepared for questions

The flow of a poster (English)



The flow of a poster (English)



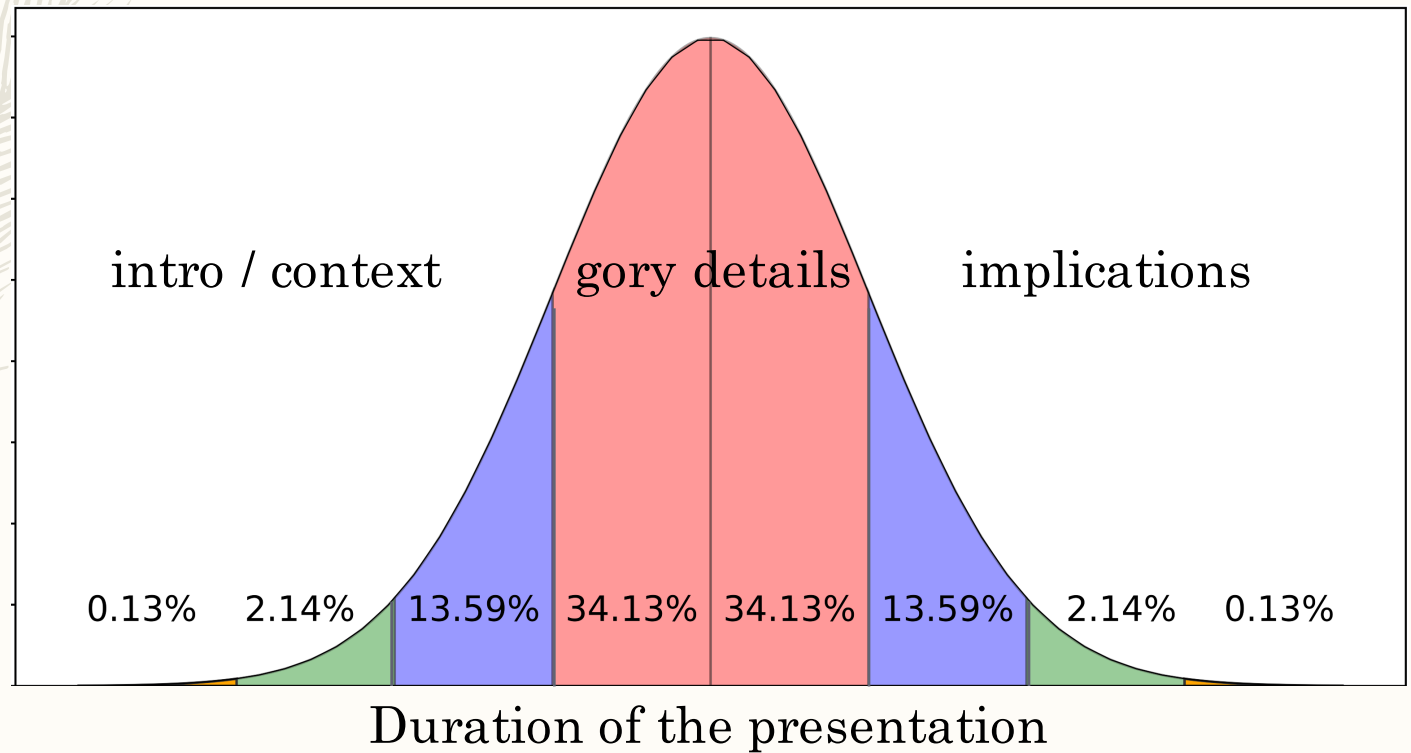


Oral Communication: talks

- The 10-minute talk is the currency of your job
- Time slots are 15 minutes
- Allow 1-2 minutes for change-over
- Allow 3 minutes for questions
- Be respectful and successful...
- Meet your audience where they are

Anatomy of communication: perspective of the presenter

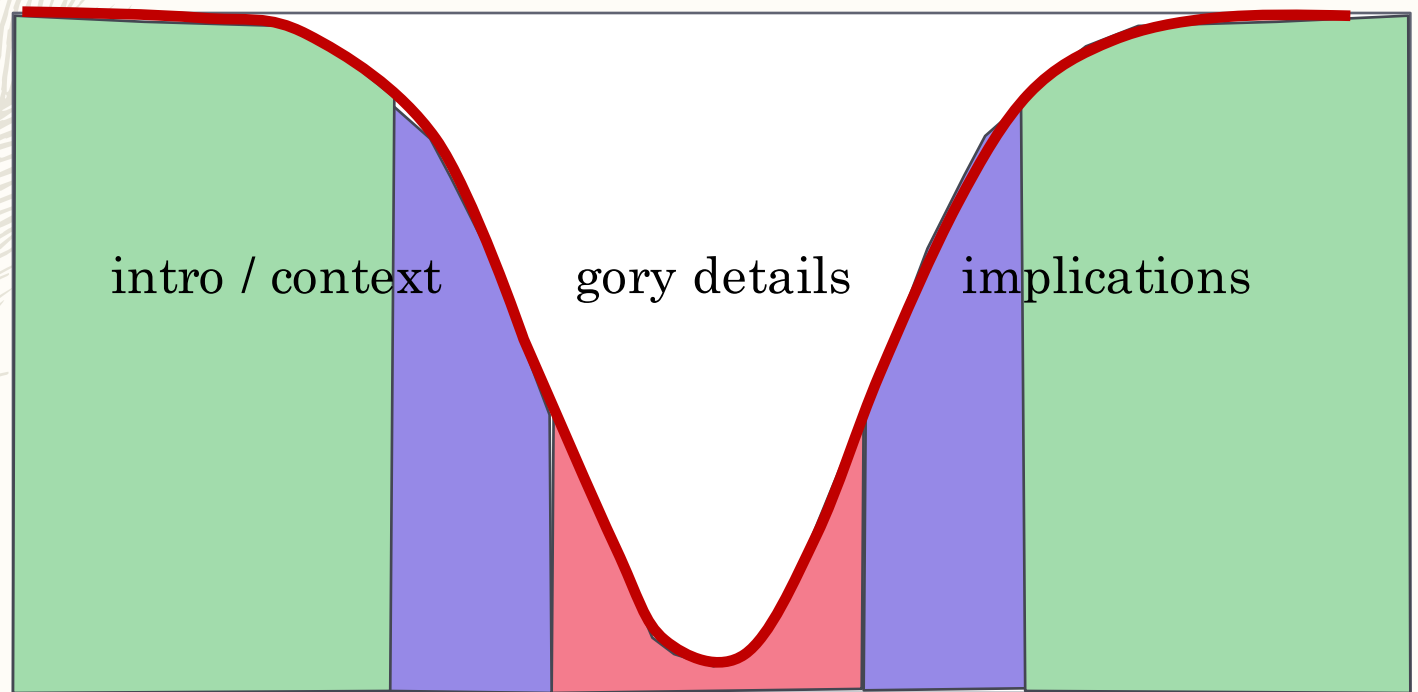
How much you care



Anatomy of communication: perspective of the audience



How much they care



Duration of the presentation



Budget 1 slide per idea / minute

- Be respectful of the audience by...
- **Giving each slide a declarative title**
- Keeping font large enough to see (minimum 24 point)
- Avoiding animations
- Avoiding too many colors
- Avoiding data tables and complicated maps
- Avoiding complex equations

Do you know what makes bad slides?

Use lots of fonts!!!

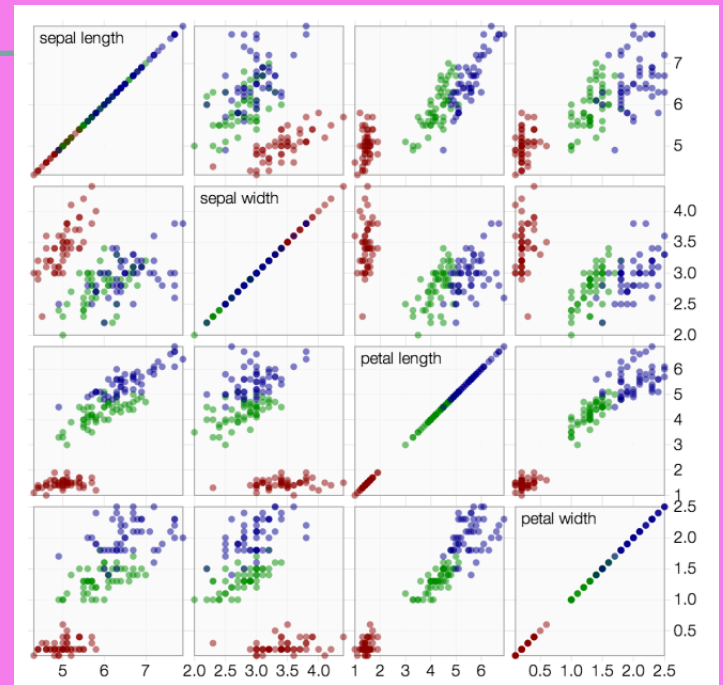
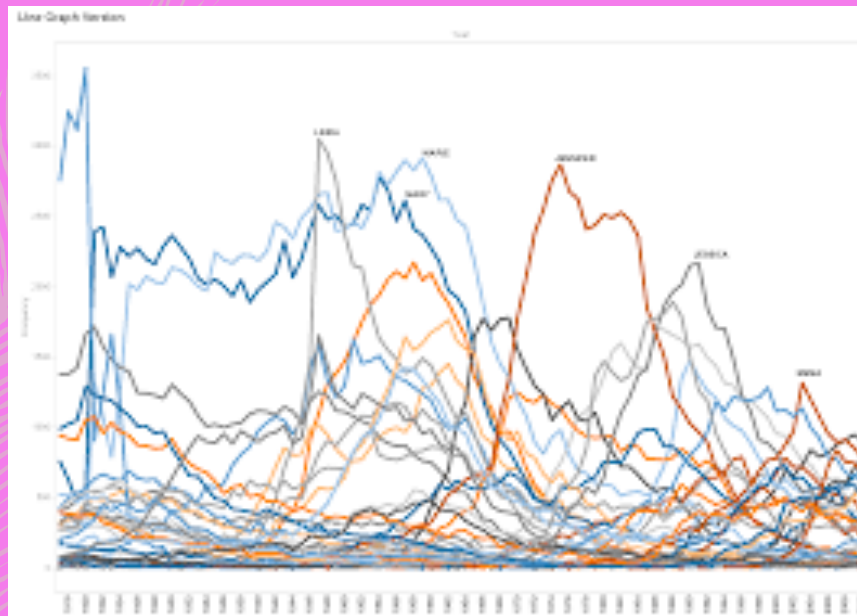
Data Tables ▾

Type to filter (F3) Data Table ID ▾

Sorting: Data Table ID ▾ ↕

Data Table ID	Description	Table No.	Table Col...	Table Rows	Key Value...	Selection ...
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DEL-POCARD	Delivery Posted Order Card	10001216	21	20	1	SelectOne
DEL-POLINE	Delivery Posted Order Lines	99001473	12	10	3	NoSelect
DEL-PORDER	Delivery Posted Orders	10001216	11	10	1	NoSelect
DISCINFO	Show Discount Info	99001454	3	12	0	SelectOne
GETORDER	Get order	36	8	12	3	SelectOne
HOSP_DEL-DRIVER	Delivery Driver List	99001633	6	20	1	SelectOne
HOSPCONFIR	Hosp. Station Printing Confirm	10001207	3	11	0	NoSelect
HOSPHAND_SPLITBILL2	Split Bill Window - No Cover	99008981	5	10	0	MultiSelect
HOSPHAND_STAFFSTORE	Staff List	99001461	4	8	1	NoSelect
HOSPHAND_TRANSLINE2	Transf. Lines Window -No cover	99008981	5	10	0	MultiSelect
HOSPMOSTAT	Hosp. Monitor Station Status	10001215	6	12	0	NoSelect
HOSPPRSTAT	Hosp. Print Station Status	10001215	3	12	0	NoSelect
HOTELGUEST	Hotel Guests Demo Only	80000	3	16	1	NoSelect
INFOCODE	Infocode List	0	0	0	0	NoSelect
INV_LU	Inventory Lookup	99001608	5	12	0	NoSelect
ITEM	Item List	27	5	16	1	MultiSelect

Do you know what makes bad slides?





Presenting has its own challenges

- Make sure you understand the AV equipment
- Upload your talk on time (prepare in advance)
- Rehearse your presentation
- Prepare to succeed – do not apologize for failure
- Help yourself succeed (note cards, sentences)
- Face the audience and talk clearly
- Keep the pointer under control at all times



Rules for behavior are unwritten

- Dry humor wins over racist or ribald humor
- Humor cannot save you – be good first, funny second
- Geologists use slides to guide their talk
- Attire can vary widely but...
 - Suits are not necessary (we put the casual in business casual)
 - Underwear is presumed necessary but should not be seen
 - Ripped and dirty clothes are bad (unless you just got out of the field or narrowly escaped a pyroclastic flow)

Economists



Teaching and learning are united

- It is not all about you
- It is about the material and the ideas
- It is about students becoming one with the ideas
- It is about helping students grow

Teaching *is* student-centered

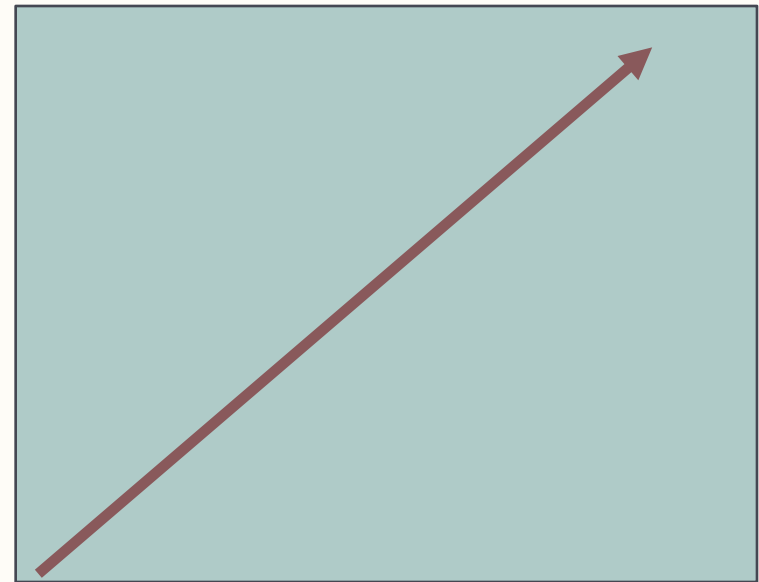


Let me help you learn how to master this challenge

Teaching requires a range of skills

- Tutoring
- Discussions
- Laboratories
- Lectures
- Large lectures

Amount of persona



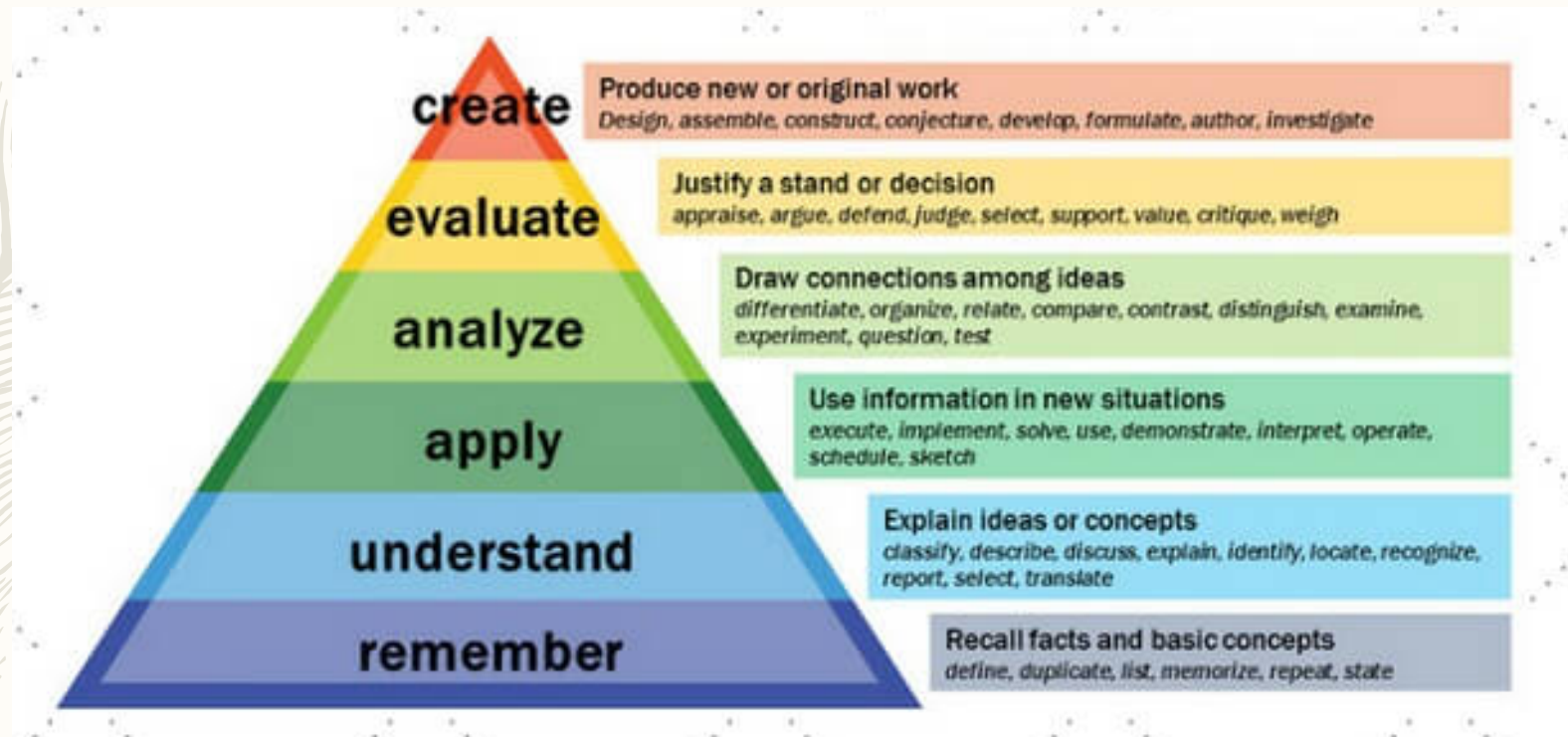
Size of group

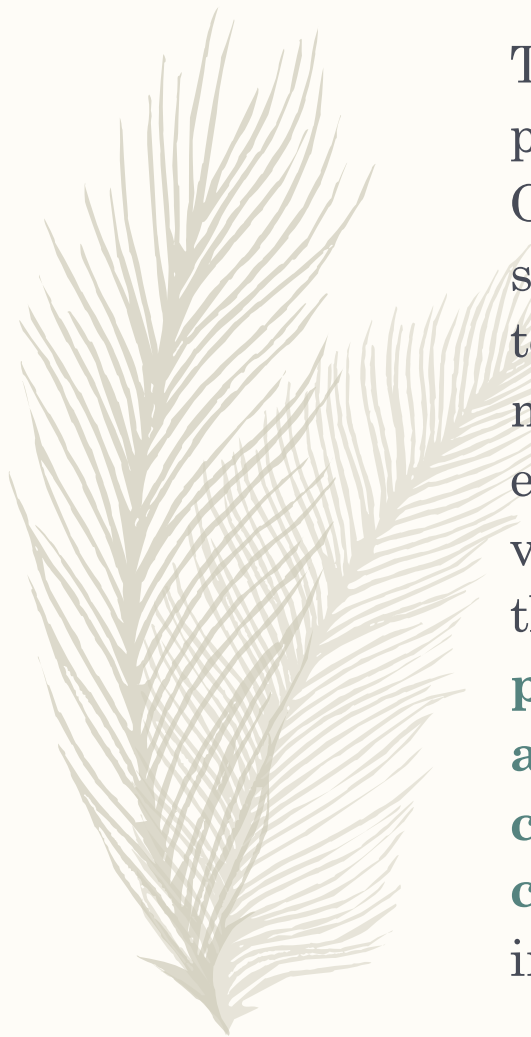


Meaningful assessment is hard

- Learning objectives / outcomes
 - Something the student should be able to do
- Measuring learning
 - Tasks overlap the learning outcomes
 - Tasks explore the limits of intellectual engagement
- Opportunity to show improvement
 - Multiple assignments of increasing difficulty
 - Repeated editorial passes before submission of a document

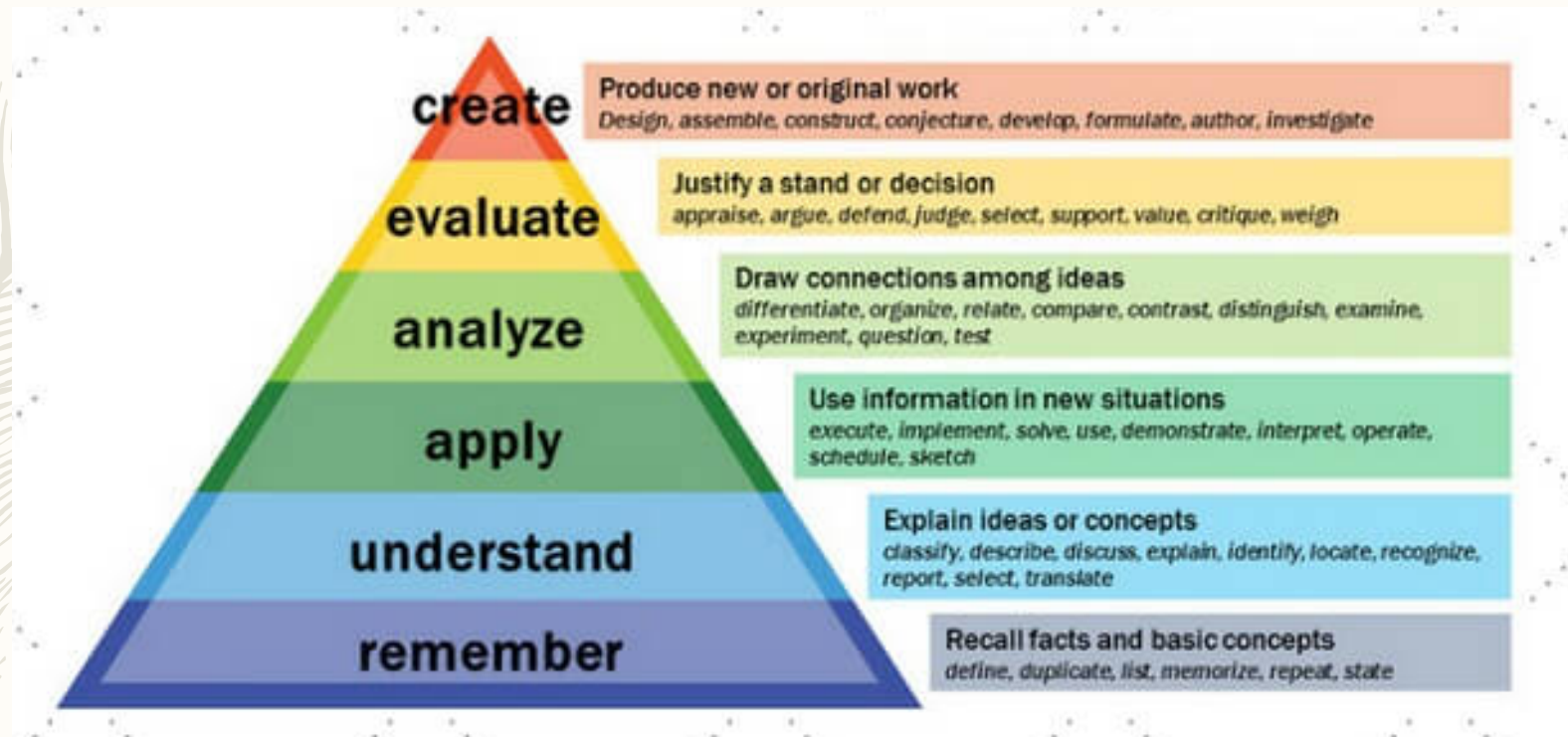
Bloom's taxonomy for assessment





The geosciences are concerned with understanding Earth processes and the evolutionary history of the Earth. Geoscientists work to discover and develop natural resources such as groundwater, metals, and energy sources; to solve technology-generated environmental problems such as acid mine drainage and waste disposal; to predict geological events, such as the occurrence of earthquakes and volcanism; and to solve fundamental questions concerning the origin and evolution of Earth and life. **Our degree programs stress data collection; investigation, analysis, and synthesis of information related to complex natural problems; and rigor of thought and clarity of oral and written expression.** A senior thesis involving independent research is required of all students.

Bloom's taxonomy for assessment





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