



Shifting from a Competitive to a Collaborative Environment

APEX Access Workshop

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APEX Access Program



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<https://albertaprecisionexchange.ca/access-program>
apex.access@albertaprecisionexchange.ca

Workshop Agenda & Outcomes

Activity	Format	Timeframe
Teamwork challenge	Group activity	15 min.
Collaborative research - background	Presentation & discussions	30 min.
Teamwork challenge	Group activity	15 min.
What are the benefits and challenges of collaborative research?	Discussion in groups	30 min.
Closing exercise	Group activity	20 min.
Final remarks	Group discussion	10 min.

Outcomes:

- Different perspectives on work styles of people from different backgrounds
- Roadmap of barriers to achieving a collaborative environment & potential solutions
- List of goals you would like to achieve in your own work environment



Marshmallow challenge

Marshmallow challenge

Goal

- Build the tallest free-standing structure.
- The team that builds the tallest structure measured from the table's surface to the top of the marshmallow wins the challenge.

Rules

- The Structure Must Stand on Its Own. The structure shouldn't hang or lean on any other objects
- The Whole Marshmallow Must Be on Top. Teams need to place whole marshmallows at the top of their structure. They must not break it into smaller pieces. Any team that intentionally destroys, hides or eats its marshmallow is disqualified.
- No Need to Use All The Ingredients. There's no restriction on how much materials the teams use.



Reflection activity

- What worked? (reasons for success)
- What did not? (reasons for failure)
- How did the team dynamic feel to you?
- How did you behave in the team?

**What does collaborative
or team science mean
to you?**

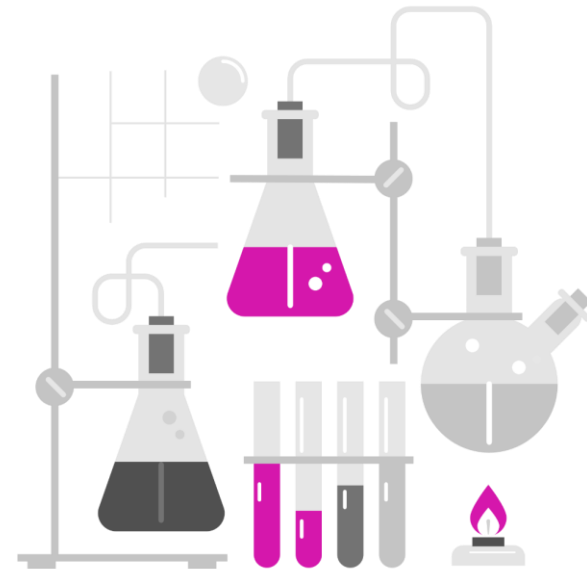
Why does diversity in teams matter?

- Clear benefits to having teams with interdisciplinary expertise
- Benefits of social diversity
 - Greater creativity
 - Each member brings unique information and knowledge
 - Team members are more open to different ideas
 - Team prepares ideas and arguments more thoroughly



Other benefits of diversity

- Different perspectives enable better and more thorough science
 - Sex and gender differences
 - Social relationships & cultural practices
- Public involvement in science
 - Citizen science
- Personally relevant research
 - Tackling social problems



Collaborative science

- Certain groups tend to be more collaborative
 - A 2017 study of a Brazilian researcher database (> 270,000 scientists) showed that men collaborate more with men while women collaborate more equally and with different fields
 - Certain cultures tend to encourage collaboration more (e.g., Europe)
- Less wasted resources
 - Publishing negative findings
 - Disseminating information effectively



Research culture in North America

- Tends to encourage competition over collaboration
- Publication record (primary authorship) has the most weight in decisions

Comments from grant applications:

- “To be more competitive [the applicant should] continue to focus on publishing high quality first author research papers.”
- “This leads one to the impression that [the applicant’s] research contributions are largely of a collaborative nature, rather than that of an independent [investigator].”

Thoughts and comments?

Is competition always a bad thing?



- Competition can lead to increased productivity and efficiency
- Focus resources on select problems
- Can lead to new and better ways of doing things

When does healthy competition become unhealthy?

Barriers to collaboration

- Research contributions from underrepresented groups often less credited and cited (e.g., women)
 - They often have to work harder to get authorship credit
- Systemic issues (sexism, racism) may discourage mentorship from individuals of underrepresented groups
 - Example – a now retracted paper stated that female-female mentorships could hinder the careers of female scientists
- Interpersonal conflict
 - Examples – poor communication, unclear expectations, no clear leader



Teamwork challenge

Goal: To make longest paper chain # part1

- Make teams
- Simple instruction (Use provided supplies)
- Each team gets 2 minutes to make a paper chain
- Team with the longest chain will win

Instructions to the leader

- Can talk while doing the task
- Use both hands
- No assigned leader

Supplies

- Pair of scissors
- Construction paper
- Tape (with the dispenser)

Goal: To make longest paper chain # part2

- Make teams, Choose a leader
- Leader gets instructions
- Leaders communicate with team ONLY FOR 30 SECONDS
- Each team gets 2 minutes to make a paper chain
- Team with the longest chain will win

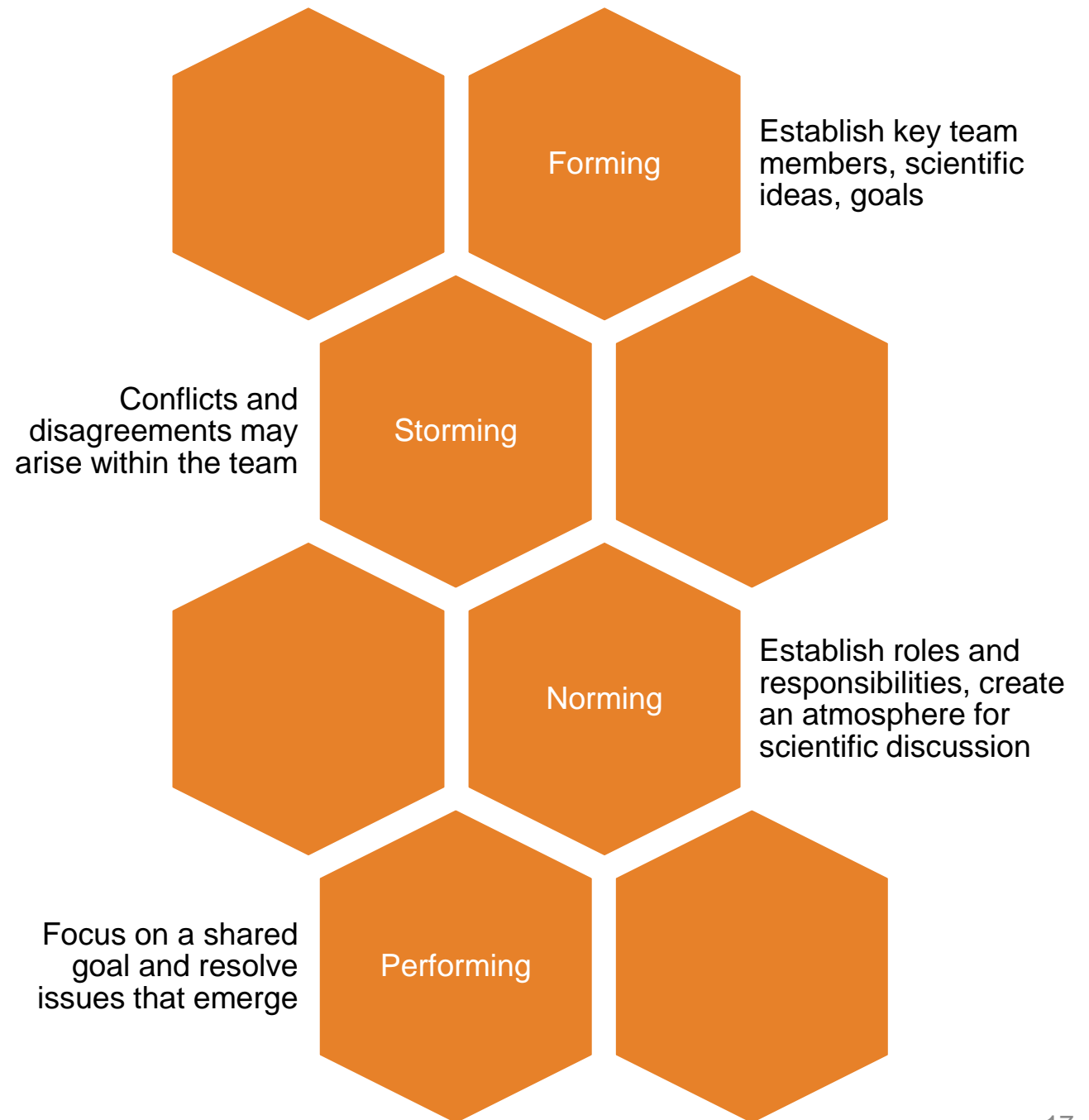
Instructions to the leader

- Communicate rules to the team (30 sec)
- Absolutely no talking while doing the task
- Use only one hand (left or right)

Supplies

- Pair of scissors
- Construction paper
- Tape (with the dispenser)

Effective team development



Strategies for Collaboration

- 1. Posing Questions** – Questions may be posed to clarify, explore perceptions, assumptions, and interpretations, and to invite others to inquire into their thinking.
 - For example: “What might be some conjectures you are exploring?”, “Which [data], specifically?” or “What might be an example of that?”
- 2. Paraphrasing** – Using a paraphrase starter that is comfortable for you and following the starter with an efficient paraphrase assists members of the group in hearing and understanding one another as they converse.
 - For example: “So...”, “As you are...” or “You’re thinking...”

Strategies for Collaboration

3. **Pausing** – Pausing before responding or asking a question allows time for thinking and enhances dialogue, discussion, and decision-making.
4. **Putting Ideas on the Table**
 - For example: “Here is one idea...” or “One thought I have is...” or “Here is a possible approach...” or “Another consideration might be...”.
5. **Providing Data** – Providing data, both qualitative and quantitative, in a variety of forms supports group members in constructing shared understanding from their work.

Strategies for Collaboration

- 6. Paying Attention to Self and Others** – Meaningful discussion are facilitated when each group member is:
 - Conscious of self and of others
 - Aware of what they are saying and how it is
 - Aware of how others are responding
- 7. Presuming Positive Intentions** – Assuming that others' intentions are always positive promotes and facilitates meaningful discussion, and prevents unintentional put-downs.

Group discussion

How do we incorporate collaborative practices into research and education?

What are the current barriers to collaboration?

- How can we overcome these?

How would your work benefit from a collaborative approach?

How do you approach a collaborator that isn't actually collaborating?

- What are the negative aspects of losing a competitive approach?

- How do you avoid bad collaborations in the first place?

Ideas from group discussion

- Barriers to collaboration:
 - Difficult to get multi-disciplinary grants (and manage those grants if they are obtained)
 - No time!
 - Lack of roles to facilitate collaboration (difficult to fund those positions so only possible in large groups, many scientists don't have this skill set)
 - Some may see collaboration as a sign of weakness or that they lack knowledge
 - Competition for resources and fears about lack of credit for work
 - Ego
 - Competing ideas/interests – for example some groups may be trying to prove other groups wrong
 - Publication system – first authorship most important

Ideas from group discussion

- Some solutions/things to consider:
 - There are more multi-disciplinary grants available, but researchers need to make sure the team is diverse and well balanced
 - Consider collaborations with non-scientists (e.g., business people, advocacy groups, the public, scientific administrator, scientific communicator)
 - Make science more accessible (journalism, talking with the media)
 - Train students and managers/leaders in science communication (professional development)
 - Mentors/leaders should also be respectful in communications with trainees
 - Set clear expectations!

Final thoughts

- Write down goals you would like to achieve in the next 1 – 5 years to become a better collaborator
- Some examples:
 - Develop better team communication practices
 - Initiate authorship/contribution discussions
 - Start difficult conversations with collaborators when they aren't collaborating!

Resources

- Katherine W. Phillips and collaborators. “How diversity works”, *Scientific American*, 2014
- Eduardo B. Araújo and collaborators. “Gender differences in scientific collaborations: Women are more egalitarian than men”, *PLOS One*, 2017
- Natalie Matosin and collaborators. “Negativity towards negative results: a discussion of the disconnect between scientific worth and scientific culture”, *Disease Models & Mechanisms*, 2014
- Matthew B. Ross and collaborators. “Women are credited less in science than are men”, *Nature Accelerated Article Preview*, 2022
- Holly Else. “ ‘Ignored and not appreciated’: Women’s research contributions often go unrecognized”, *Nature News*, 2022
- Lindzi Wessel. “After scalding critiques of study on gender and mentorship, journal says it is reviewing the work”, *Science Insider*, 2020
- L. Michelle Bennett and Howard Gadlin. “Collaboration and team science: from theory to practice”, *Journal of Investigative Medicine*, 2012

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