

**Footholds question**

**What does it take to get  
along in a profession  
(as a researcher)?**

**Where does one learn?**

## **Exposition**

*For example:*

What is an argument?  
Where is elaboration needed?  
How are definitions written?  
Who are the possible audiences?

## **Research**

*For example:*

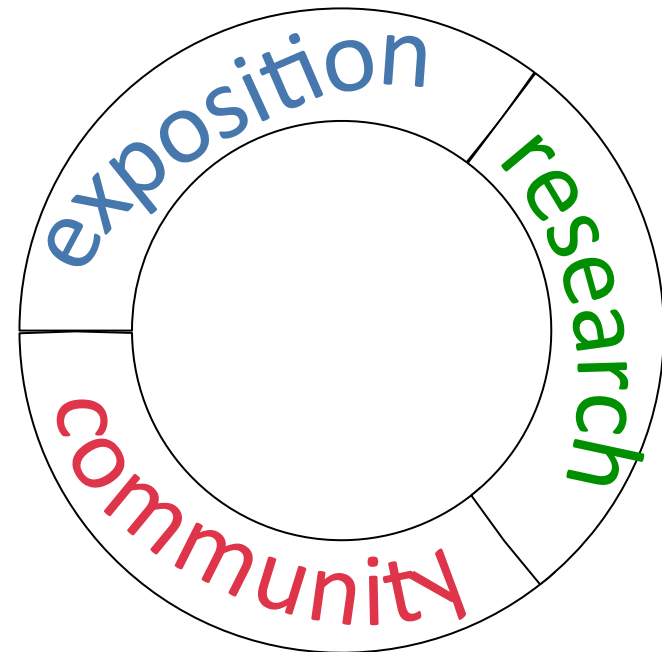
What are the big problems?  
What does it mean for a research question to be well-defined?  
What is the literature?

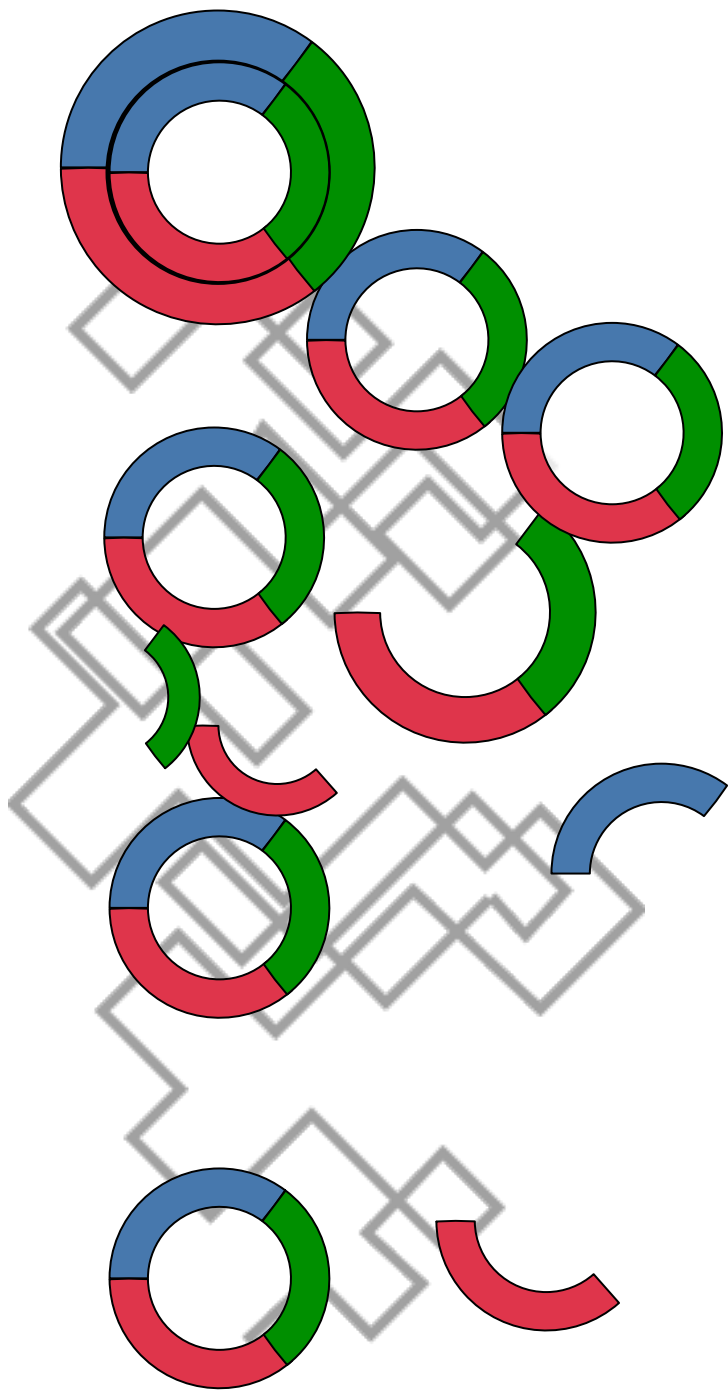
## **Community**

*For example:*

Who can I turn to?  
Who's done this before?  
Who's doing this right now?  
What are resources?

**Footholds question**  
**What does it take to get along in a profession (as a researcher)?**  
**Where does one learn?**





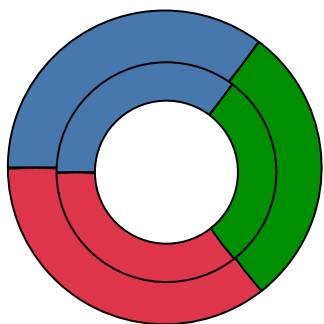
## Route taken

Learned to

- Communicate mathematics and mathematics education
- ... to mathematicians and mathematics educators
- Construct problems and arguments in both fields

Found communities for

- Teaching, research, service

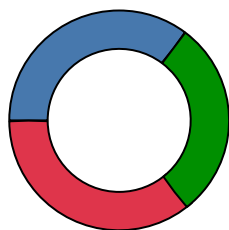


# Route taken: Mathematics

## The Standard Model:

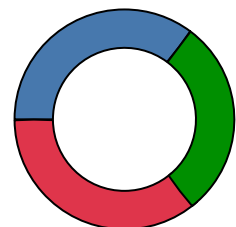
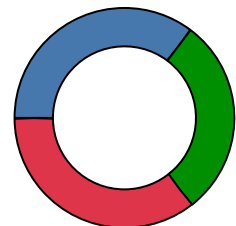
Pursuing one discipline.

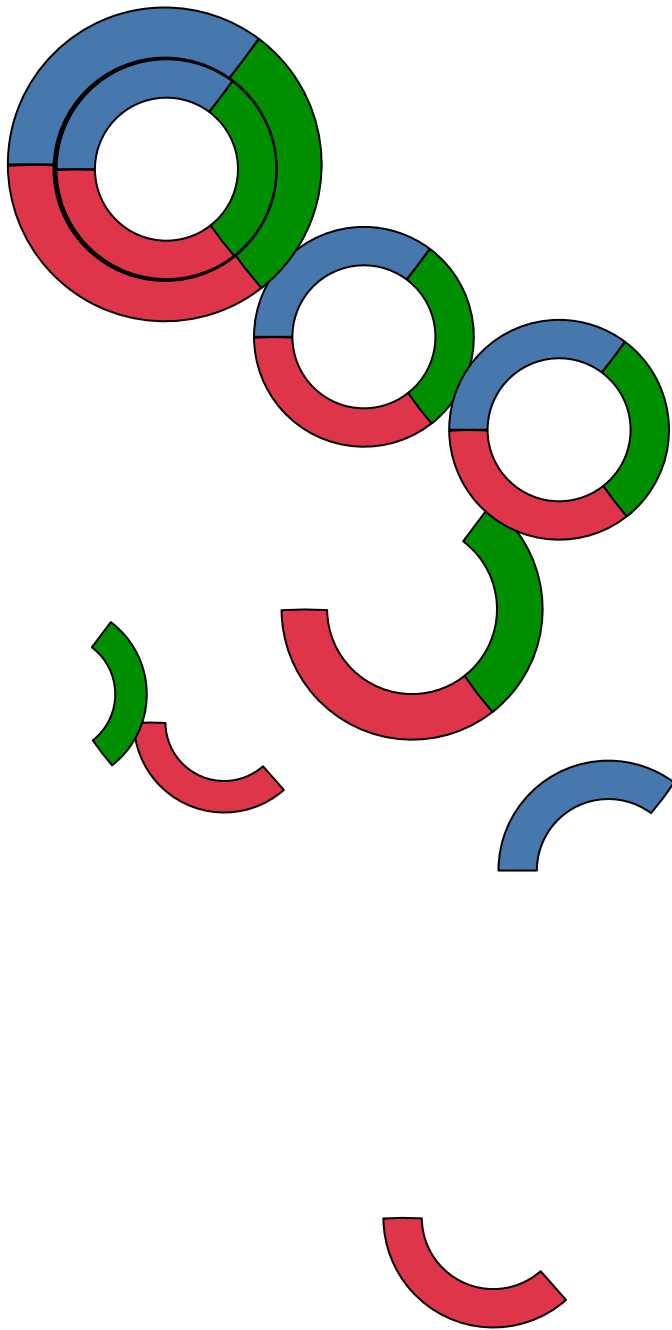
Academic infrastructure is designed to teach professional skills for particular disciplines.



## “Footholds”:

- built in to the infrastructure, **meant to be visible**;
- Infrastructure is the safety net.
- **relatively standard order** for cultivating knowledge of the discipline.





# Route taken: Math Education

## The need to:

Move between disciplines.

Infrastructure is designed to cultivate one discipline at a time.

## “Footholds”:

- Outside standard view of infrastructure;
- Ad-hoc; feel scattered if not on “standard” foothold

## Rely on humans within

infrastructure rather than infrastructure itself.

# Addressing the problem

In the current infrastructure, working successfully in mathematics education seems to depend on:

- Being pointed toward high professional standards held by both mathematics and mathematics education. To sight them; work toward them; listen; become “bilingual”.
- Experiences that support learning exposition and research, and entry into the community.
- Finding ways to work autonomously yet under a mentor already in the profession
- Chancing on generosity, open-mindedness, and trust of professionals in the infrastructure – even if they’ve only met you briefly or not yet at all.



# Addressing the problem?

**Problem:** If more mathematicians are to work in mathematics education, **professional opportunities cannot depend only on chance.**

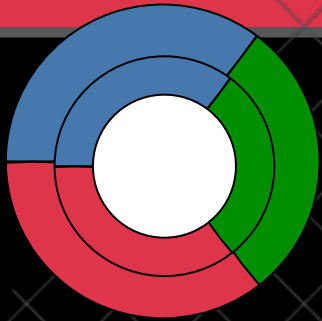
**What opportunities can fit into the infrastructure?**

What models that we've heard about here or elsewhere can be generalized? (*Too many great ones to cite all here*)

What is necessary for generalization? (*Jim Lewis' observations about challenges of collaboration?*)

**Conjecture 1:** This is a human as well as infrastructure problem, not strictly an infrastructure problem.

**Conjecture 2:** This is a solvable problem though it may take **a while.** (*cf. transitions from mathematical academia to industry, other STEM fields, ...*)



**Thank you!**

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