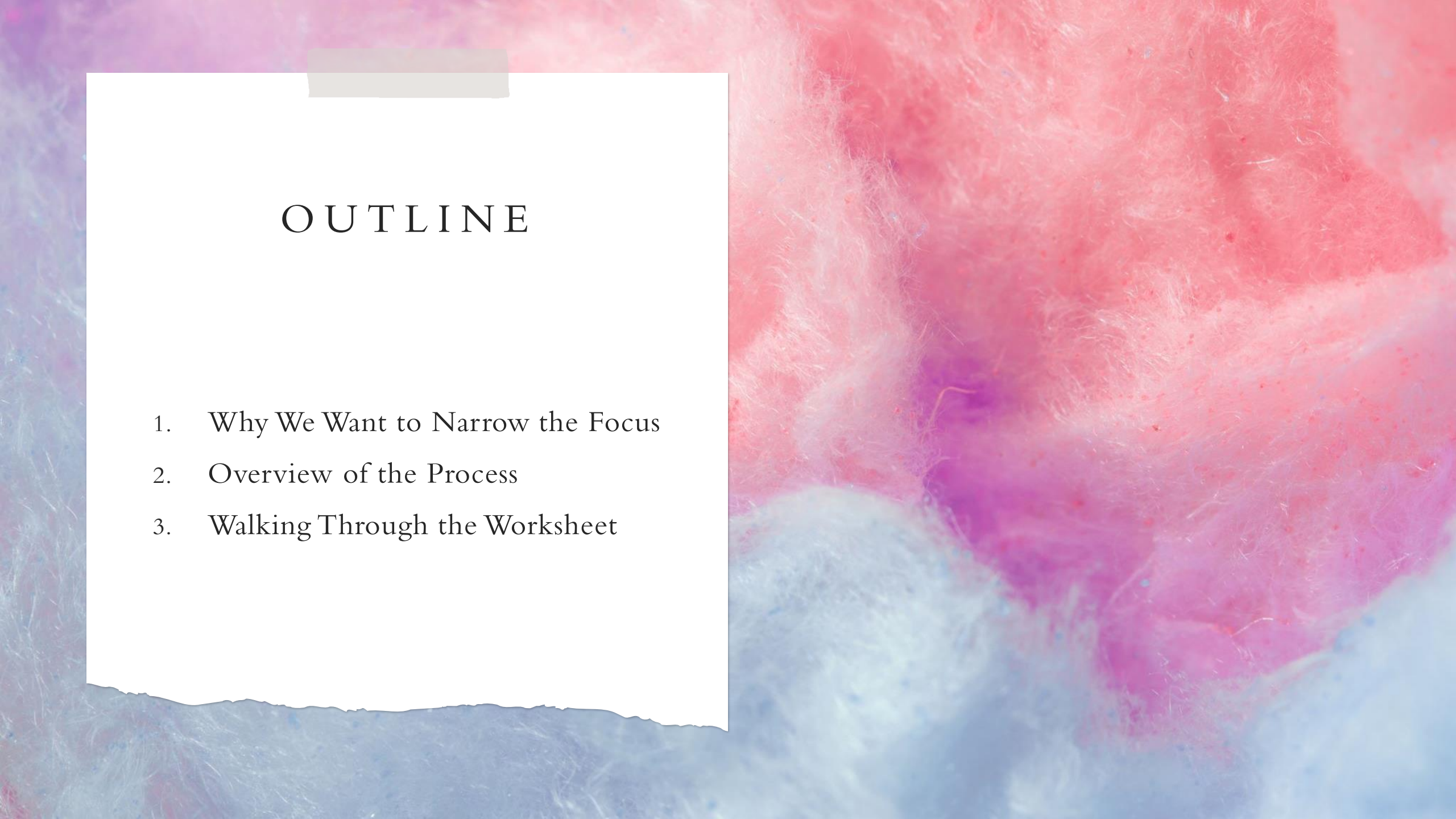


NARROWING DOWN A RESEARCH IDEA

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OUTLINE

1. Why We Want to Narrow the Focus
2. Overview of the Process
3. Walking Through the Worksheet

WHY NARROW THE FOCUS?



TIME CONSTRAINTS



FIND RELEVANT
SOURCES FASTER

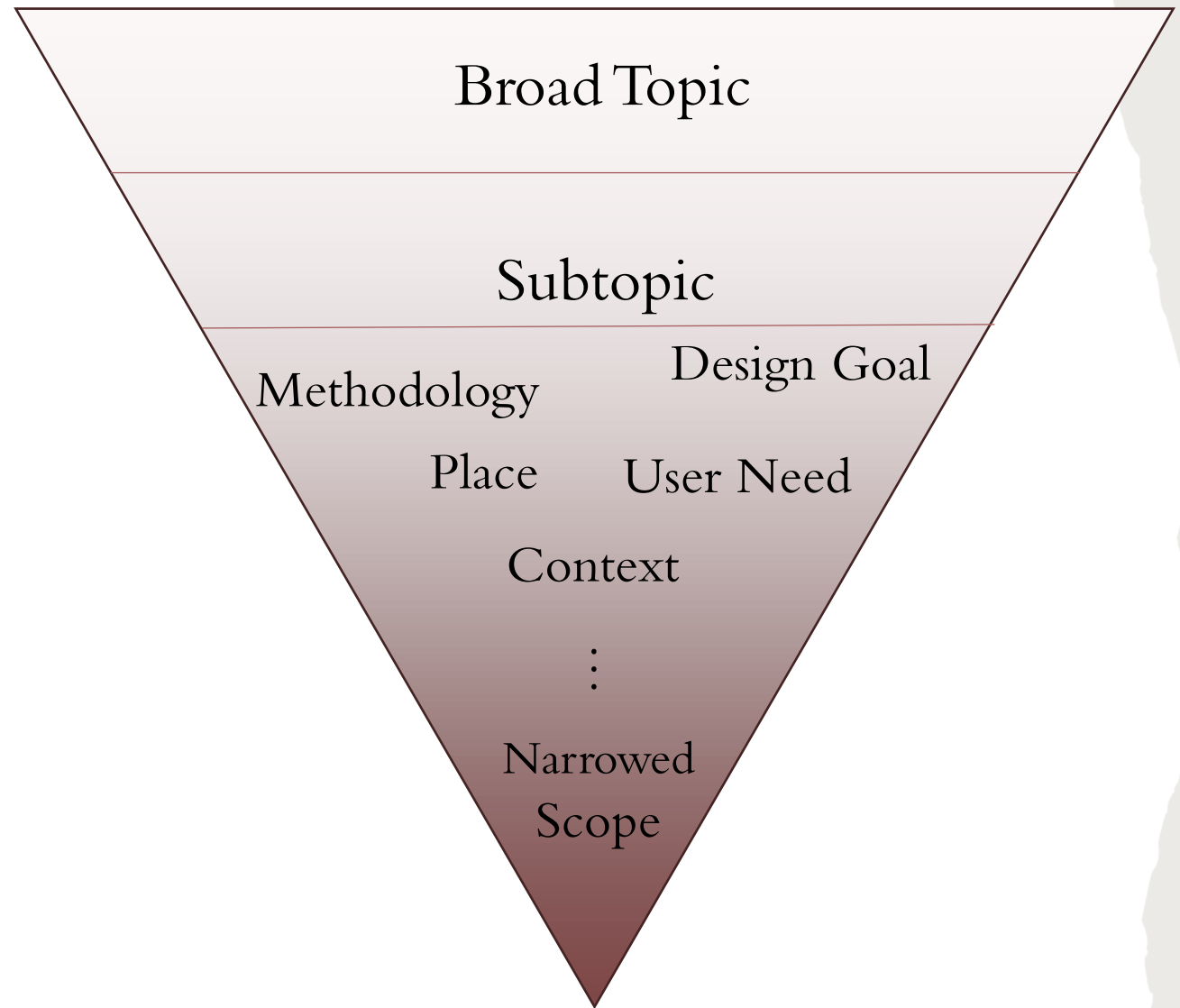


STRONGER AND MORE
PERSUASIVE RESULTS

BEFORE
STARTING TO
NARROW, IT
CAN BE
HELPFUL TO
DO A BRIEF
LIT SEARCH

- You don't know what you don't know!
- This is not necessary for today, but I highly recommend you explore a little bit

START
BROAD AND
NARROW
DOWN
THROUGH
SPECIFIC
QUESTIONS



TAKE OUT YOUR WORKSHEET

BROAD TOPICS ARE AREAS THAT INTEREST YOU OR A PROBLEM STATEMENT

Examples:

- Sports medicine
- Climate change
- Robotics
- Plastic Waste

What makes this interesting or important to you? What solution do you wish existed?

- I got injured, and I want to help others recover more quickly
- I love to go birdwatching and want to help save them
- I wish I had a robot that can sort my trash and recycling

In your worksheet, answer questions 1 and 2

NARROWING THE FOCUS FOR SCIENTIFIC QUESTIONS

Questions that can help you narrow down a research question:

- What population/place/time am I looking at?
- What facet of the problem am I interested in?
- If there are many causes, can I focus on just one?
- What can I actually reliably measure?

Broad idea: Mental health

Subtopic: Stress management in teenagers

Context: High school students during exam season

Facet of interest: meditation

Measurement: perceived stress levels, hours of sleep

Research question:

“How does daily mindfulness meditation for 10 minutes affect perceived stress levels and sleep quality among high school students over four weeks?”

ENGINEERING-SPECIFIC NARROWING QUESTIONS

- **What is the context:** people, time, place
- **Design Goal:** What does the product need to be able to do? Under what conditions?
- **User Need:** What do users want, or what gap in their lives are you filling?

Broad idea: Renewable energy

Subtopic: Solar power

Context: Off-grid rural areas

Design goal: Build a portable solar-powered water purifier

Research/Design question:

“How can we design a low-cost, solar-powered water purification unit that produces at least 5 liters of clean water per hour?”

EXAMPLES OF SUFFICIENTLY NARROW QUESTIONS/DESIGN GOALS

- “How does changing the dosage of chemical X change plant growth over 2 months?”
- “How can we design a machine learning algorithm that can predict bird migration endpoints in the PNW with at least 80% accuracy?”
- “Is there a statistically significant difference in injury rates between people who wear shoe X vs shoe Y?”

Finish part 3 of the worksheet

THIS IS AN ITERATIVE PROCESS!

- You might start your literature search, then realize that someone answered your question, or it's not possible to answer the question → that's ok!
- Modify slightly:
Ex. maybe a different study population, or context, or design feature

WOULD ANYONE LIKE TO
SHARE THEIR
RESEARCH/ENGINEERING
QUESTION?

ANY QUESTIONS?

Thanks for listening