Welcome to the introductory workshop for the MIT Research Slam / 3MT!

While we’re getting set up, review the rules for the 3-Minute Thesis* competition. To ask questions, raise your hand/use the chat.

- A single static PowerPoint slide is permitted. No slide transitions, animations or ‘movement’ of any description are allowed. The slide is to be presented from the beginning of the oration.
- No additional electronic media (e.g., sound and video files) are permitted.
- No additional props (e.g., costumes, musical instruments, laboratory equipment) are permitted.
- Presentations are limited to 3 minutes maximum. Competitors exceeding 3 minutes are disqualified.
- Presentations are to be spoken word (e.g., no poems, raps, or songs).
- Presentations must be submitted as pre-recorded videos (with slide embedded as an image in top right corner) through a Dropbox link by March 15.
  - Finalists’ videos will be played during the April 11 Showcase, with commentary by judges.
  - Detailed video creation guide: bit.ly/3mt-guide-2021
  - Example judging rubric: bit.ly/3mt-mit-rubric

* We’re calling it a Research Slam because we’re including postdocs, too.
Crafting a Compelling 3-Minute Talk

2021 MIT Research Slam / 3-Minute Thesis

Dr. Jacqueline Goldstein, Communication Lab Instructional Designer
Dr. Diana Chien, Communication Lab Senior Program Manager

Development Credit: Dr. Jesse Dunietz
The Research Slam Event:

MIT's 2nd Annual Research Slam!

Featuring 3MT® Three Minute Thesis

Founded by the University of Queensland

WCC at MIT

MIT School of Engineering Communication Lab

CAPD

Graduate Student Council of the Massachusetts Institute of Technology

External Affairs Board
The Communication Lab is a discipline-specific peer coaching service for technical communication.

Find a Comm Lab + free guides to technical & professional communication, in a discipline close to yours:

mitcommlab.mit.edu/find
Let’s analyze a winning 3MT video together.

- How would you summarize the main message of the presenter’s research in one sentence?
- What did the presenter do to get that message across?
- What could they have done better?
By the end of this workshop, you will be able to...

1. Distill a central message from complex ideas about a research topic.

2. Plan an engaging story that is memorable.

3. Craft a visually appealing slide that supports your message & story.

Attend the workshop on March 2, 1-2:30pm to work on your presentation delivery!
1. Distill a central message

2. Plan a memorable, exciting story

3. Craft a visually appealing slide
Gold wires can improve the sensitivity of tiny devices, called nanocantilevers, that can measure single molecules and may allow doctors to diagnose disease through the breath.
Activity: use the worksheet

Half-Life Your Message

Let’s experiment with rapidly distilling a central message!

You’ll be paired with a partner. Be ready to time each other. Partner 1 will practice saying their message in...

- 60 sec
- 30 sec
- 15 sec
- 8 sec

Then it’s Partner 2’s turn!

Activity: use the worksheet

Half-Life Your Message

- What your audience should take away from your 3-minute talk.
- Write down your central messages.
- You can keep iterating!

1. Distill a central message

2. Plan an engaging story

3. Craft a visually appealing slide
The Hourglass is an outline for your talk.

There’s a problem that’s worthwhile to work on!

Your work is addressing the problem!

Based on work by Scott Olesen (BE Communication Lab) & Carnegie Mellon U.’s Global Communication Center
Based on work by Scott Olesen (BE Communication Lab) & Carnegie Mellon U.'s Global Communication Center

Medical tests at the doctor can be painful, like through needles.

Devices can test for molecules through breath, but are large and expensive.

Nanocantilevers could measure molecules in breath, but we need more sensitive measurements.

To enable more sensitive measurements, she figured out a way to attach gold wires to nanocantilevers.

Bend in gold wires can be measured electrically, and allows for more sensitive measurements of molecules.

Technology is still new, but more sensitive measurements could lead to painless medical tests through breath.
Activity: Use the worksheet

The Hourglass for you: 1 bullet point per box.

- **Establish significance:**
  A problem your audience cares about.

- **Describe the status quo:**
  What we currently know/do...

- **Identify a gap:**
  We need to know/do...

- **What did you do?**
  In order to know/do...

- **Fill the gap:**
  You found (or could find)...
  We now (or could) know/do...

- **Re-establish significance**
  The problem is (or could be) improved.
The Hourglass is an outline for your story.

- **Establish significance:**
  A problem your audience cares about.

- **Describe the status quo:**
  What we currently know/do...

- **Identify a gap:**
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- **What did you do?**
  In order to know/do...

- **Fill the gap:**
  You found (or could find)...
  We now (or could) know/do...

- **Re-establish significance**
  The problem is (or could be) improved.
A story has elements:

1. Involving character(s) the audience is interested in...

2. with tension...

3. through a coherent sequence of events...

4. to a resolution.
Story elements align with the Hourglass

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Tension</th>
<th>Events</th>
<th>Resolution</th>
</tr>
</thead>
</table>

**Establish significance:**
A problem your audience cares about.

**Describe the status quo:**
What we currently know/do...

**Identify a gap:**
We need to know/do...

**What did you do?**
In order to know/do...

**Fill the gap:**
You found (or could find)...
We now (or could) know/do...

**Re-establish significance**
The problem is (or could be) improved.
A research story can be about your process of discovery...

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>You, the researcher(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension</td>
<td>How will you solve the problem?</td>
</tr>
<tr>
<td>Events</td>
<td>Things you do, or that happen to you, as you solve the problem.</td>
</tr>
<tr>
<td>Resolution</td>
<td>Your research solves the problem!</td>
</tr>
</tbody>
</table>
...or a research story can be about your impact on humanity...

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Humanity (or a specific representative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension</td>
<td>A challenge that could lead to a suboptimal future.</td>
</tr>
<tr>
<td>Events</td>
<td>How the world will evolve with/without your work.</td>
</tr>
<tr>
<td>Resolution</td>
<td>Your research leads to a better future!</td>
</tr>
</tbody>
</table>
...or a research story can be about your object of study.

<table>
<thead>
<tr>
<th>Character(s)</th>
<th>Object(s) of study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension</td>
<td>The object can’t do what it wants to / what we want it to</td>
</tr>
<tr>
<td>Events</td>
<td>What happens to that object (+ how your work changes it)</td>
</tr>
<tr>
<td>Resolution</td>
<td>Your research helps the object!</td>
</tr>
</tbody>
</table>
Stories follow a few common narrative arcs.

Rise-fall-rise

Life is terrible
Something wonderful happens!
But it’s not enough. Challenges arise.
Our heroes save the day!
A better equilibrium is reached

Medical tests at the doctor can be painful, like through needles.
Devices can test for molecules through breath, but are large and expensive.
Nanocantilevers could measure molecules in breath, but we need more sensitive measurements.
To enable more sensitive measurements, she figured out a way to attach gold wires to nanocantilevers.
Bend in gold wires can be measured electrically, and allows for more sensitive measurements.
More sensitive measurements could lead to painless medical tests through breath.

GOOD FORTUNE

ILL FORTUNE

TIME
Power electronics have been getting smaller and more efficient thanks to better switches. But size/efficiency are now limited not by switches, but by magnetic components. Designing small, efficient magnetic components is hard! We developed a new magnetic structure that has excellent performance. Power electronics have a new way forward.
Stories follow a few common narrative arcs.

“We all know that if you drop your cell phone, bad things happen.”

“But why? What if we could toss our phones around with impunity?”

“Unbreakable phones! Flexible solar panels! The possibilities are endless!”

“Normal” is questioned;

Our hero saves the day!

Life is amazing

Life is normal

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Activity: use the worksheet

1. Decide who the character(s) for your story will be.

2. Keeping your selected character(s) in mind, and elements of story, choose + fill out a narrative arc using your Hourglass outline.
A story has a **beginning**, a **middle**, & an **end**.

- **Beginning:**
  - Grab attention!

- **Middle**

- **End**
  - Create satisfaction
  - Create optimism
  - Create curiosity
You can grab the audience’s attention with a set of standard **beginnings** (hooks).

<table>
<thead>
<tr>
<th><strong>Grabber (startling/surprising)</strong></th>
<th><strong>Immersive scene or image</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quote</strong></td>
<td><strong>Anecdote</strong></td>
</tr>
<tr>
<td><strong>Invite audience to do something</strong></td>
<td><strong>Point out something on your slide</strong></td>
</tr>
</tbody>
</table>
You can grab the audience’s attention with a set of standard beginnings (hooks).

**Grabber (startling/surprising)**

“Why is it so hard to kill a zombie? If you’ve ever watched a zombie movie, you’ve noticed that they’re pretty tenacious. Well, unfortunately for us, some cancer cells act just like zombies.”

*Inspired by Trinh Hua*

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**Immersive scene or image**

“Imagine a crystal clear lake, the water as still as glass. You can see fish, birds, and beautiful, vibrant colors. You just know that life in and around this lake thrives. Unfortunately, every day this image gets further and further away from reality.”

*— Mariam Elmarsafy*

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**Quote**

“It’s like every time I take a breath, someone’s forcing me to breathe through a straw.’ That’s how Cassie, a patient in western Massachusetts, describes living with cystic fibrosis.”

*Inspired by Amanda Bordin*

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**Anecdote**

“I want to start with a story about Susie. Susie has just finished her shift...feeding meals to the homeless. On her way home, she comes across a wallet...with [fifty dollars] inside. What happens next?”

*— Sophie Cameron*
There are also some common techniques for impactful endings.

- Restate significance
- Quote
- "Bookend" (circle back to start)
- Humor or pun
- Forward-looking prediction
- Call to action
There are also some common techniques for impactful endings.

Restate significance
“Understanding the effects of high temperatures, both on concrete and on concrete structures, is an important step toward ensuring a safer nuclear future for all of us.”
—Based on Alok Deshpande

“Bookend” (circle back to start)
“Ultimately, we can help Cassie here breathe a little easier.”
Inspired by Amanda Bordin

Quote
“This tool will let drug companies find these ‘cancer zombies.’ Because as Sun Tzu famously said, ‘to defeat your enemy, you must know your enemy.’”
Inspired by Trinh Hua

Humor or pun
“I hope you remember that poo does have a purpose.”
—Kate Dutton-Regester

Forward-looking prediction
“And 10 years from now, you might just have one of these in your living room!”

Call to action
“Together, we can help challenge gender assumptions.”
—Ella Kuskoff
Activity: use the worksheet

Draft your opening & closing lines.

Opening Techniques

- Grabber (startling/surprising)
- Quote
- Invite audience to do something
- Immersive scene or image
- Anecdote
- Point out something on your slide

Closing Techniques

- Restate significance
- “Bookend” (circle back to start)
- Forward-looking prediction
- Quote
- Humor or pun
- Call to action
Make abstract concepts concrete: Metaphors help the audience connect what they don’t know to what they do know.

A bacterial bioreactor...

...is like a fancy fish tank.

- Different organisms must be kept in balance
- Different chemicals must be kept in balance
- Tricky to maintain

Images: B. Kartal, Astrobiology Magazine; aqueon.com
Guiding principles for metaphors:

1. Keep them accessible
2. Stick to a small number of consistent metaphors
3. Map the metaphor back to the technical domain
4. Test-drive metaphors on multiple audiences
1. Distill a central message

2. Plan a memorable story

3. Craft a visually appealing slide
Consider two basic approaches for what you put in your slide:

1. Provide attention-grabbing eye candy or memorable props
2. Summarize your story; create a simple graphical abstract

You don’t have to be a graphic design whiz. Be simple; be memorable.
Consider two basic approaches for what you put in your slide:

1. Provide attention-grabbing eye candy or memorable props
2. Summarize your story; create a simple graphical abstract

Edwin Davis, “Drones – Gone With the Wind”

Poanna Tran, “Relieving Pain with Tethered Toxins”
Consider two basic approaches for what you put in your slide:

1. Provide attention-grabbing eye candy or memorable props

2. Summarize your story; create a simple graphical abstract

Kate Dutton-Regester, “A Poo’s Purpose: Understanding the Reproduction of Echidnas”

Stefania Peracchi, “Moon to Mars and Beyond”
Visuals should be simple + memorable. Your audience will be most interested in listening to you!

- <5 images
- Large font (or no text)

Go for photos or simple graphics over technical figures

Kate Dutton-Regester, “A Poo’s Purpose: Understanding the Reproduction of Echidnas”

Stefania Peracchi, “Moon to Mars and Beyond”
Take-home assignment for visual design:

Identify 1-3 figures or images that would make a compelling slide in support of your message & story.
Any questions? Next steps to remember:

- Presentation delivery workshop on **March 2, 1-2:30pm**
- Get 1:1 coaching to develop + practice your talk:
  - Communication Labs
    mitcommlab.mit.edu/find
  - CAPD:
    - Grads → Career Advisors capd.mit.edu/services/appointments
    - Postdocs → Dr. Simona Rosu srosu@mit.edu
  - Writing & Communication Center
    cmsw.mit.edu/writing-and-communication-center
- Deadline for submitting your talk as a video: **March 15**
  - Video creation guide: bit.ly/3mt-guide-2021
  - Example judging rubric: bit.ly/3mt-mit-rubric