

Deploying SRE Training Best Practices to Production

How to “SRE” an SRE Training Program



Jennifer Petoff (aka Dr. J)

Twitter: @jenski

Senior Program Manager and Global Lead, SRE EDU

JC van Winkel

Site Reliability Engineer and Lead Educator, SRE EDU

Hello
my name is

Jennifer Petoff
(aka Dr. J)
Google Ireland

- Ph.D. in Chemistry
- 12 years at Google
- Co-editor of the SRE Book
- Part-time Travel Blogger at Sidewalk Safari



Hello
my name is

JC van Winkel

Google Switzerland

- 8 years at Google
- Was oncall for production monitoring at Google for 6 years
- 30 years experience in teaching



**Why is training
important?**

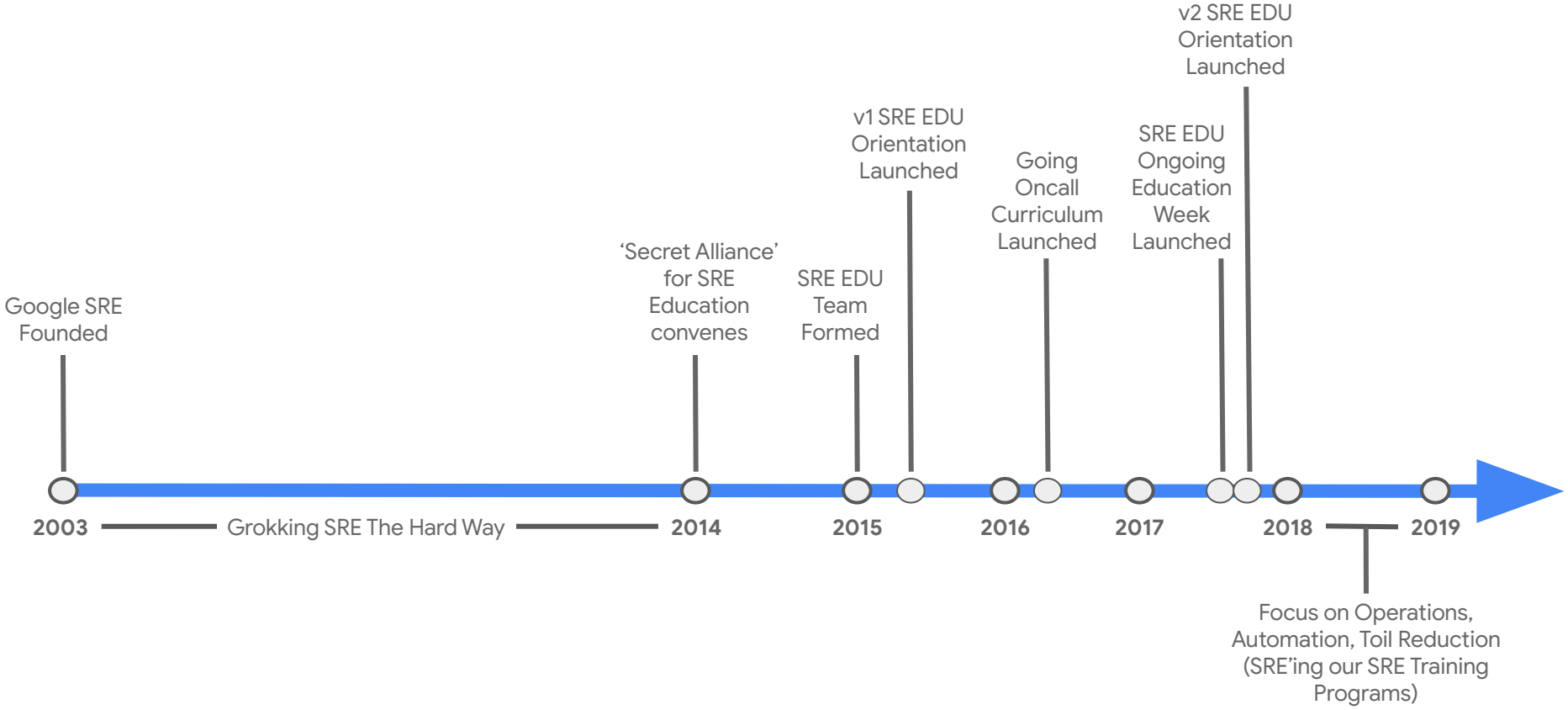




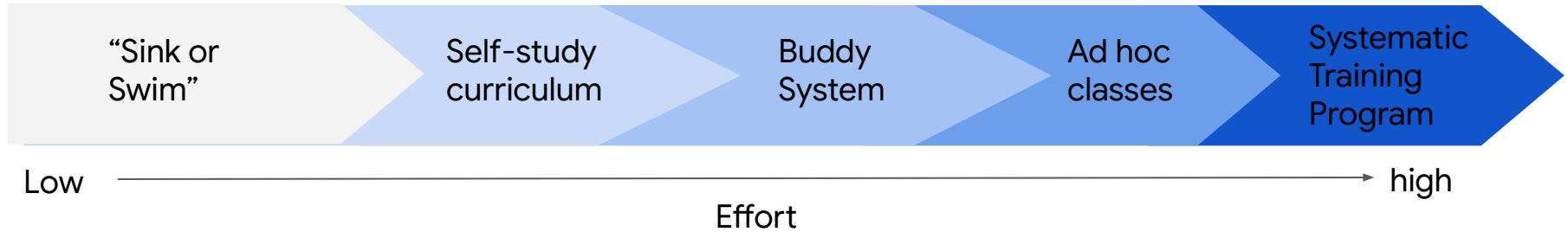
believe in
yourself



SRE EDU: A Brief History



Continuum of Training Options



- Avoid “Sink or Swim” if you value inclusivity.
 - Breeds stress, frustration, attrition
 - Imposter syndrome
- For other options, consider the ROI on the effort invested
 - Are you a small or large organization?
 - Are you growing rapidly?
 - How experienced are the people you are trying to train?

Is More Effort Always Better? No.



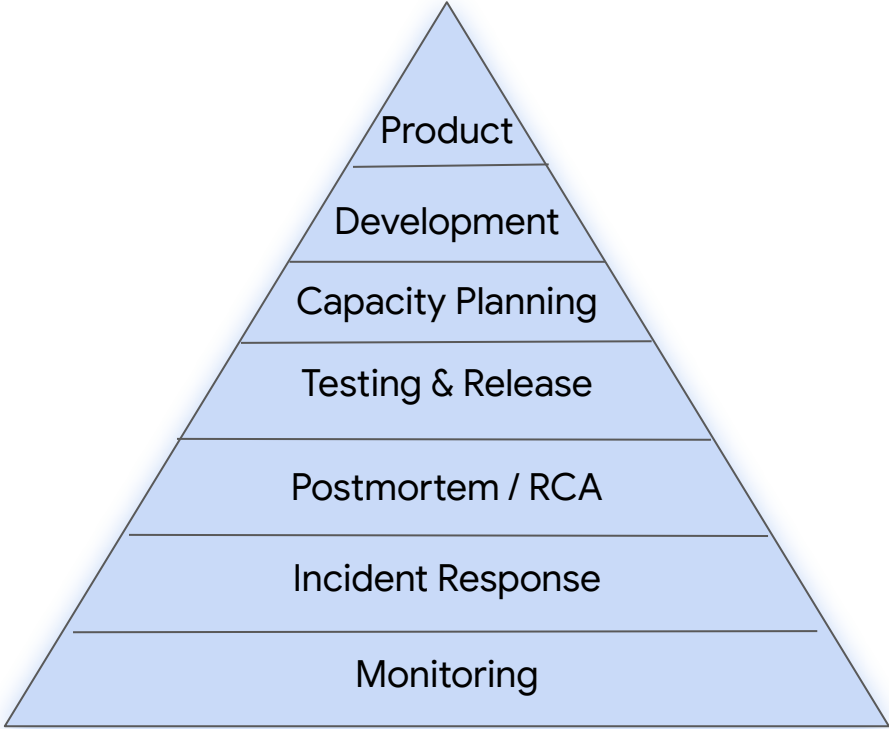
SRE Principle in Practice:

- Do just enough to meet the needs of your students.
- Keep them happy, but not too happy.
- Consider trade-offs and *avoid polishing a diamond.*

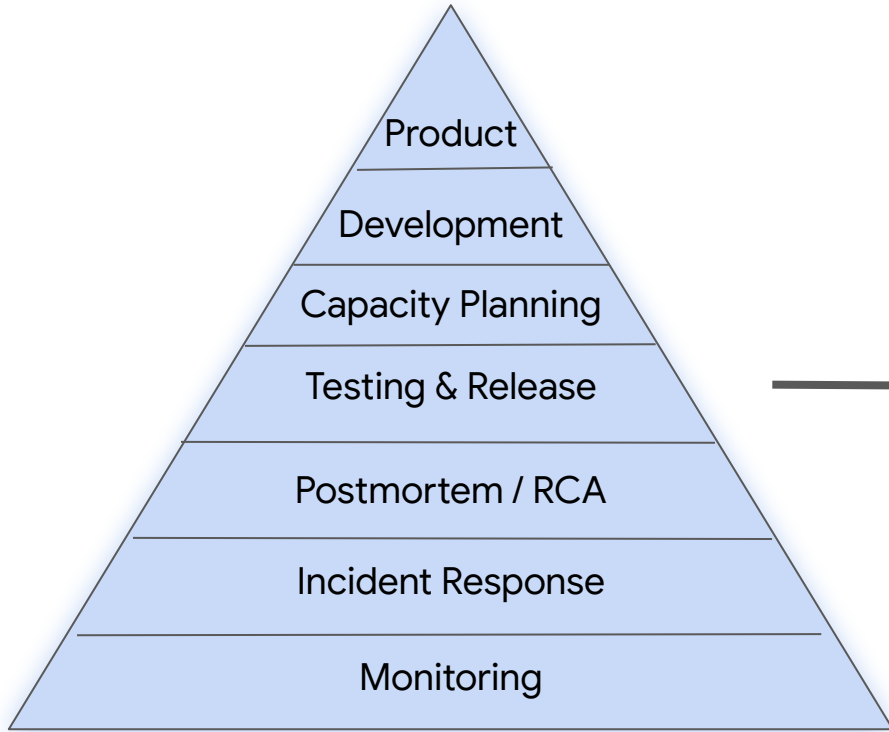
Analogy Between Software Development and Training Programs

	“What”	“How”
Software Development	Product Features	Deploying to production in a reliable way to meet the needs of our users.
Training Program	Training Content	Deploying a consistent and reliable training program that meets the needs of our students.

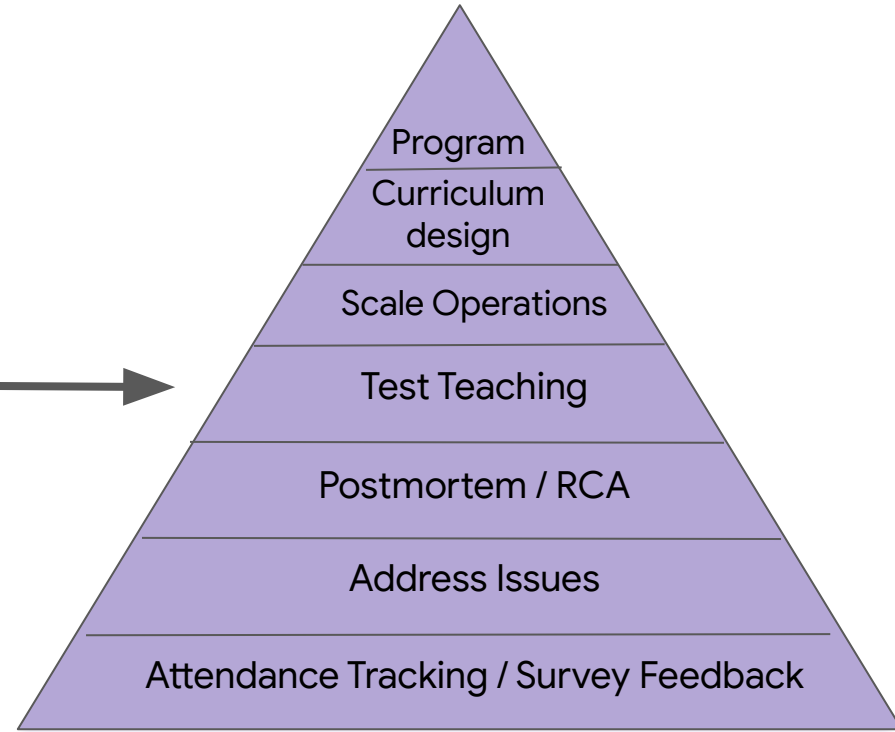
Service Reliability Hierarchy



How to Apply SRE Principles to a Training Program



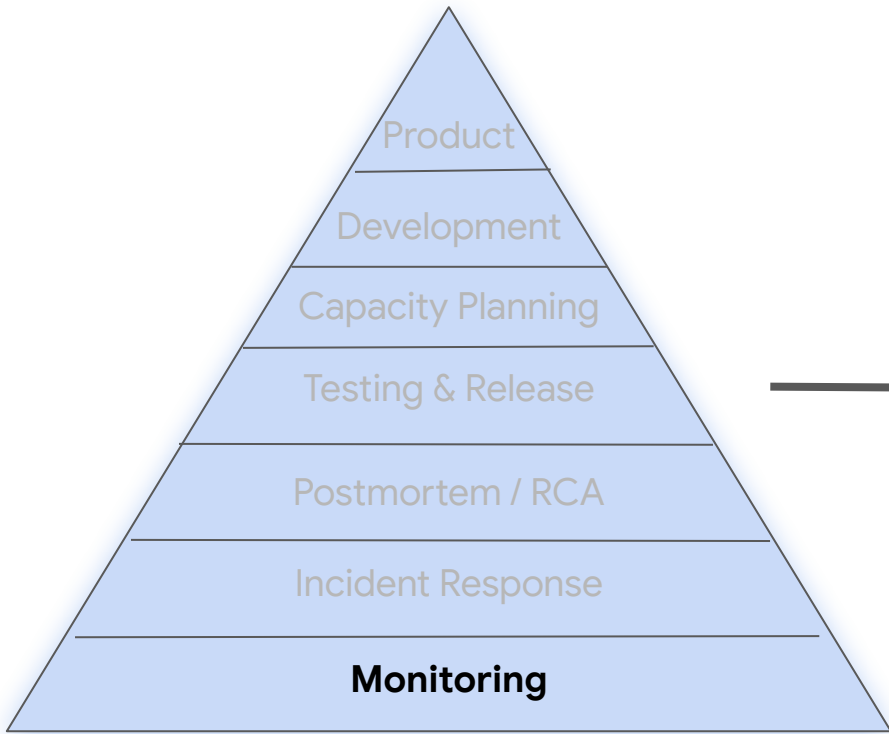
Service Reliability Hierarchy*



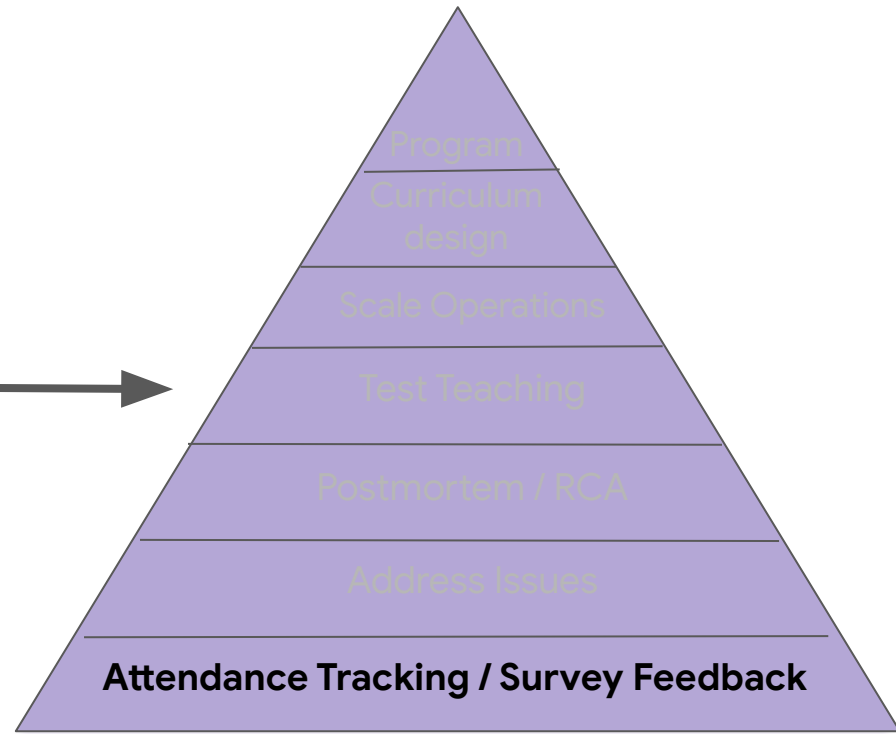
SRE Training Reliability Hierarchy

* <https://landing.google.com/sre/sre-book/chapters/part3/>

How to Apply SRE Principles to a Training Program



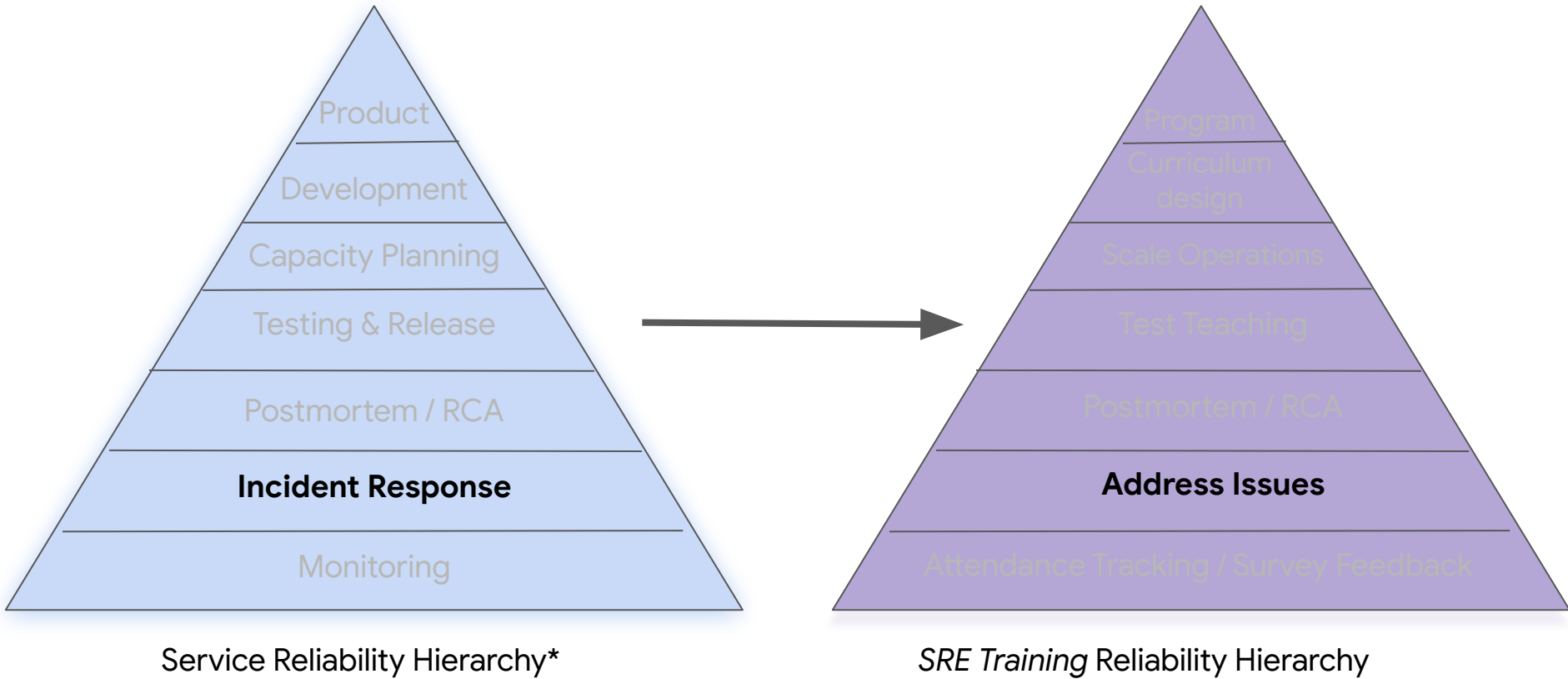
Service Reliability Hierarchy*



SRE Training Reliability Hierarchy

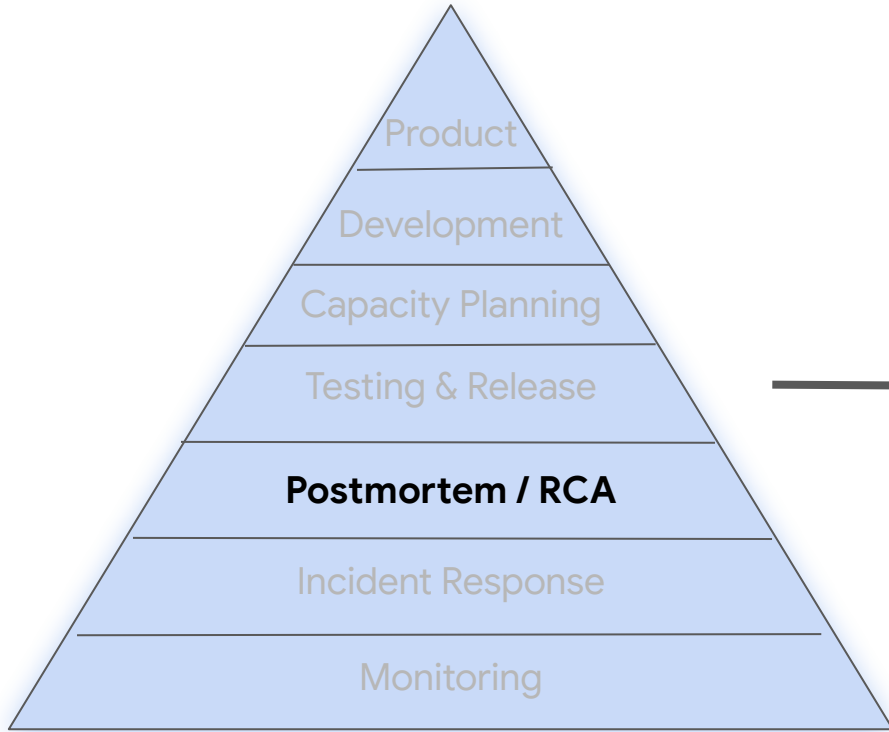
* <https://landing.google.com/sre/sre-book/chapters/part3/>

How to Apply SRE Principles to a Training Program

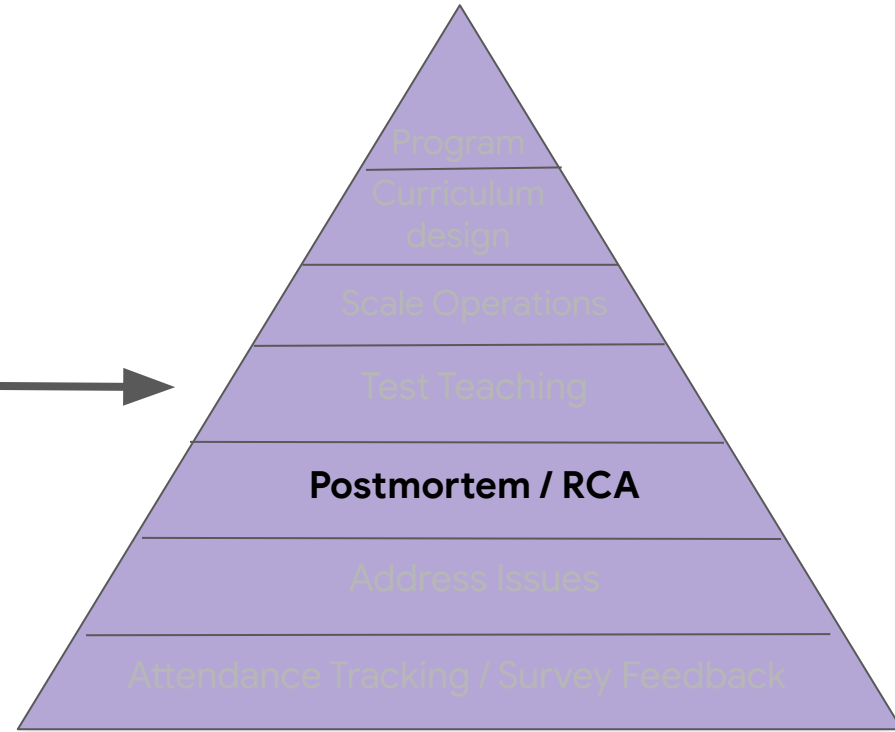


* <https://landing.google.com/sre/sre-book/chapters/part3/>

How to Apply SRE Principles to a Training Program



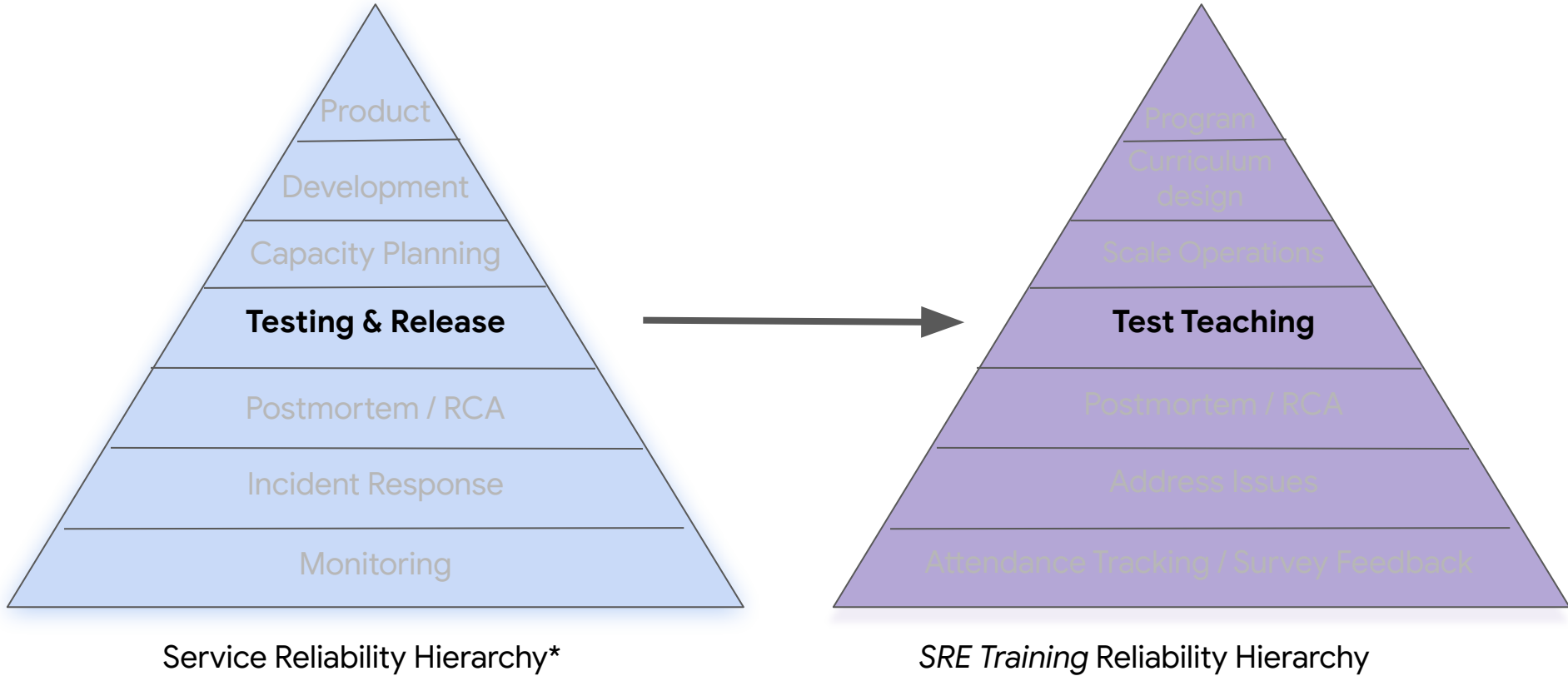
Service Reliability Hierarchy*



SRE Training Reliability Hierarchy

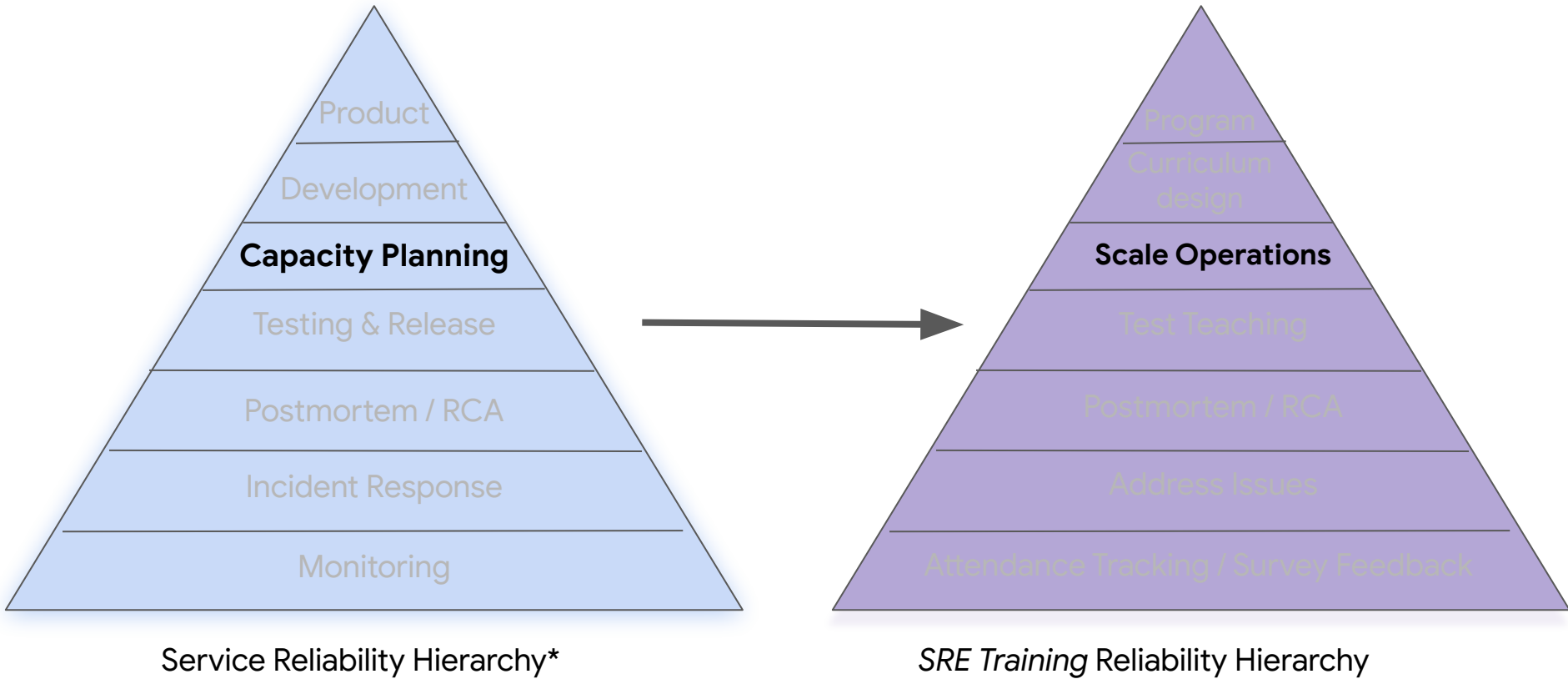
* <https://landing.google.com/sre/sre-book/chapters/part3/>

How to Apply SRE Principles to a Training Program



* <https://landing.google.com/sre/sre-book/chapters/part3/>

How to Apply SRE Principles to a Training Program

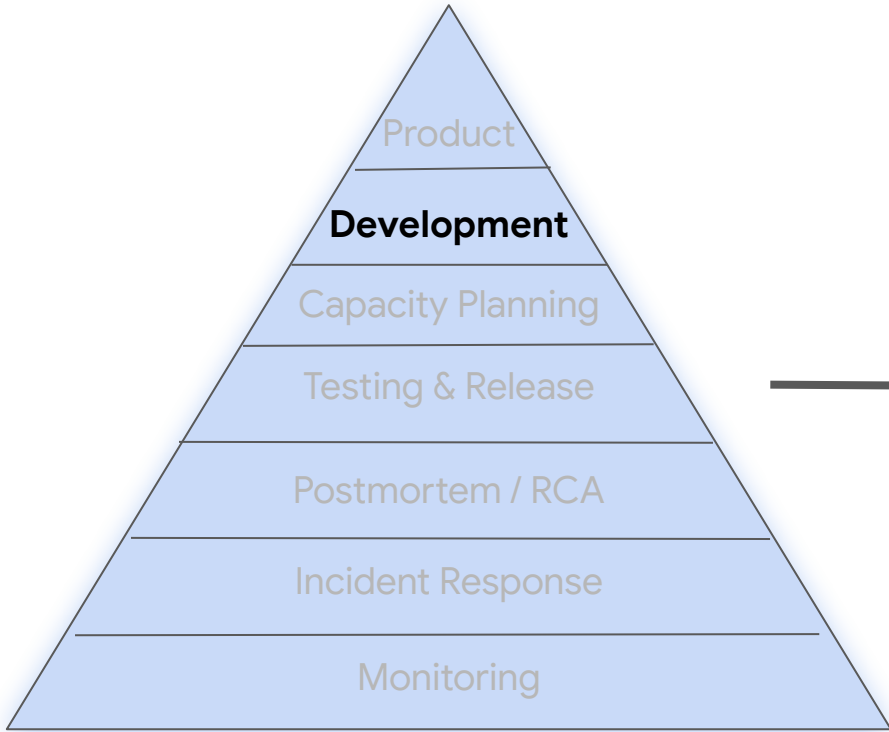


Service Reliability Hierarchy*

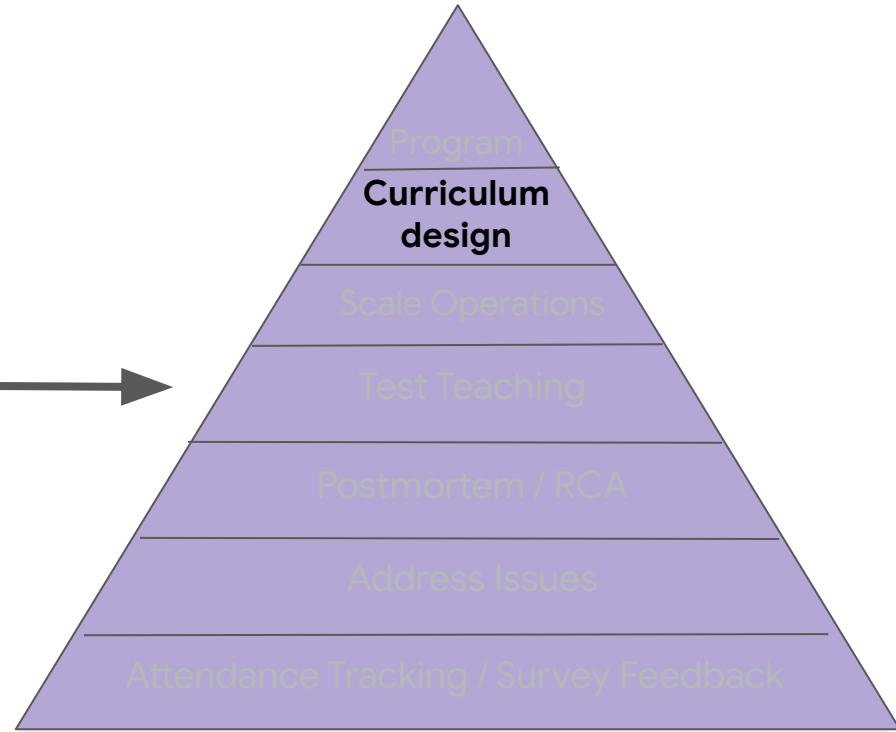
SRE Training Reliability Hierarchy

* <https://landing.google.com/sre/sre-book/chapters/part3/>

How to Apply SRE Principles to a Training Program



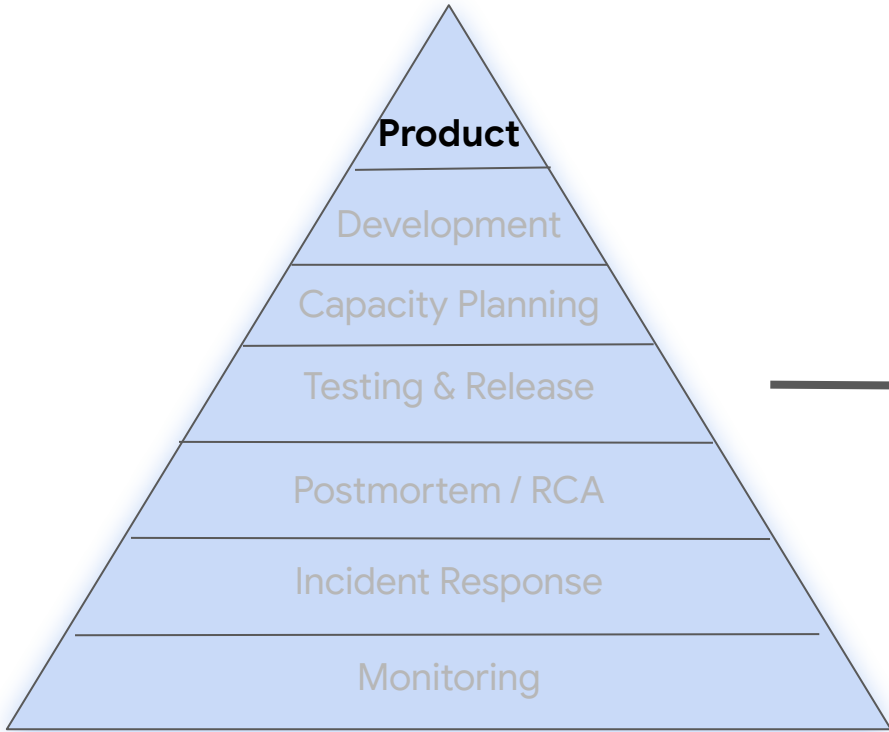
Service Reliability Hierarchy*



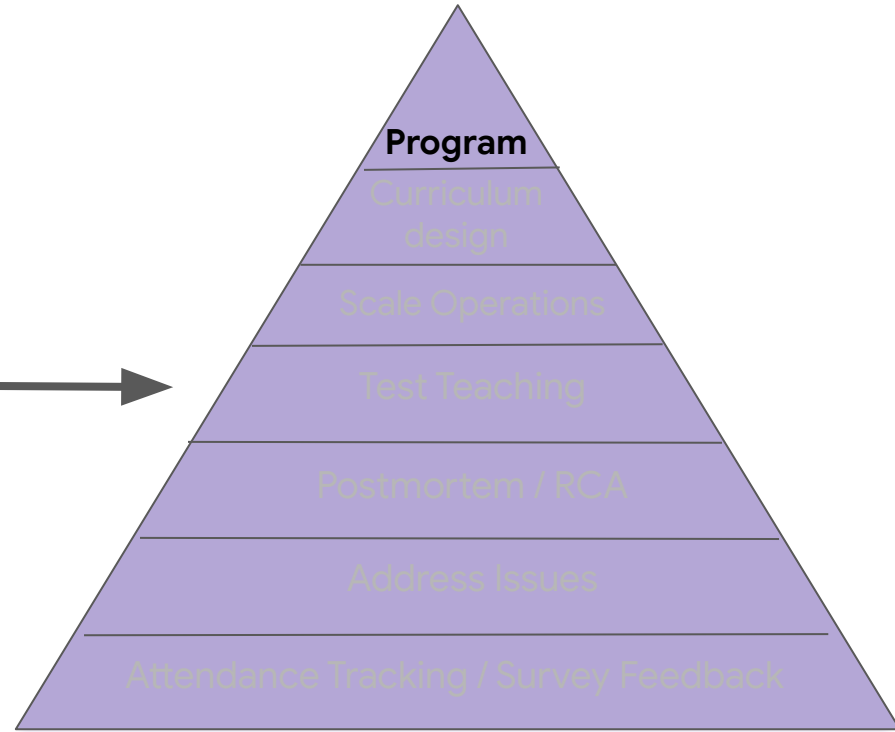
SRE Training Reliability Hierarchy

* <https://landing.google.com/sre/sre-book/chapters/part3/>

How to Apply SRE Principles to a Training Program



Service Reliability Hierarchy*



SRE Training Reliability Hierarchy

* <https://landing.google.com/sre/sre-book/chapters/part3/>

What Did Our Monitoring Tell Us?

Also more prepared, **hands-on** "Hello world" demonstrations and in-class labs allowing use of the aforementioned paths would be welcome (kinesthetic).

More time doing **hands-on work** and deeper exploration of how {redacted} were run by SRE teams would be nice.

I disliked the "wall of lecture" in some classes, meaning 1.5 or 2 hours of listening with **little/no hands-on exercise**.

Some more **hands-on activities** would have been good.

Main Goal of SRE EDU Onboarding

- Instill confidence and convey SRE Culture
 - Teach just enough tech and tools to be able to navigate our troubleshooting exercises
 - Understand it is OK to ask questions or escalate



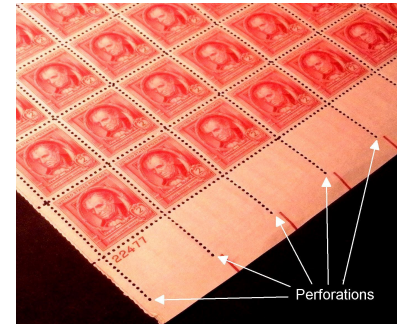
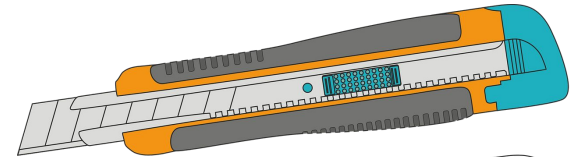
Introduction to SRE EDU Orientation v2

- Move away from passive listening
- Instill confidence
- **Troubleshoot a real system, built for this purpose**
- Facilitator backs off more and more
- Groups of three students, least experienced in the middle, driving

v2 Application Requirements

- Tangible
- 'Real world' applicable
- Distributed
- Applying best practices
- Application feels alive
- **Breakable**

"Sollbruchstelle"
(predetermined breaking point)



Typical reaction to the
training experience...



Design and Development Challenges

- Cannot "just" build it: follow best practices
- Use frameworks that guarantee best practices
- We need more than 1 instance
- Spoilers
- Development cycles...



SRE EDU Orientation Was Built with Volunteers

Pros

Knowledge about distributed systems is distributed.
Flexible workforce.


Cons


It takes longer.
“Day job” can get in the way.

“WIIFM”


Flex skills
Recognition

The "Product"


 n12 SRE EDU Photo Server UPLOAD




#DrJ




#NYC




#Tulips




#Rotterdam




#Cherries




#JC #Koala




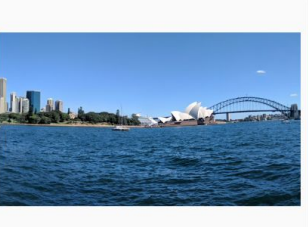
#Book



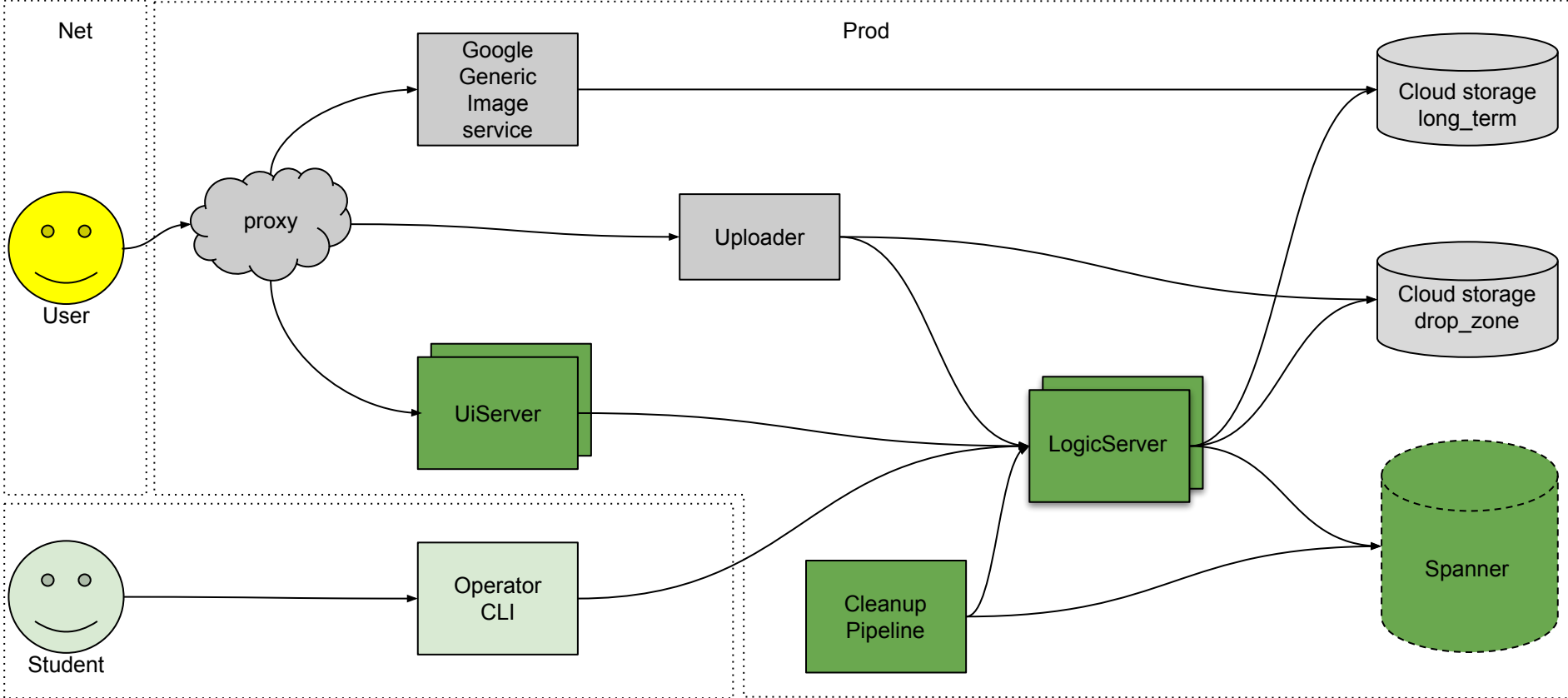
#Sydney



#Sydney



Architecture of the "Product"



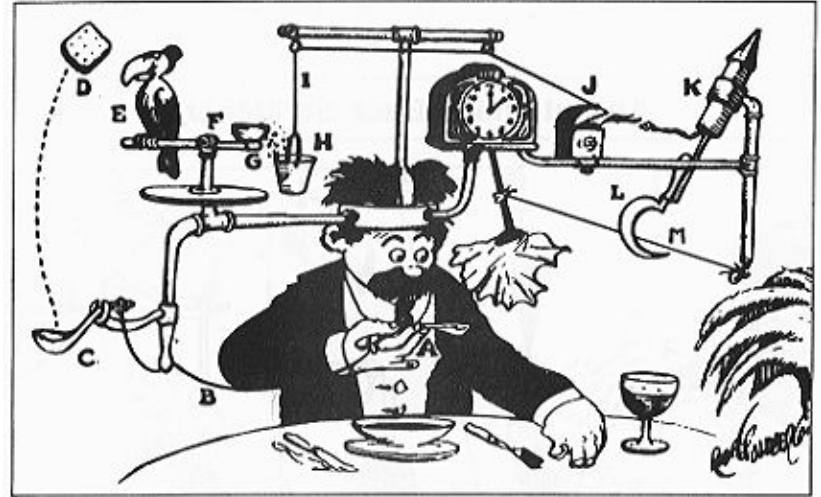
How Does v2 Work in Practice

- As much automation as possible
- Names of new hires and interested people are added to the SRE EDU list
- Automatically assigned classes and give proper production permissions
- Instructor automation
- Breakage automation...

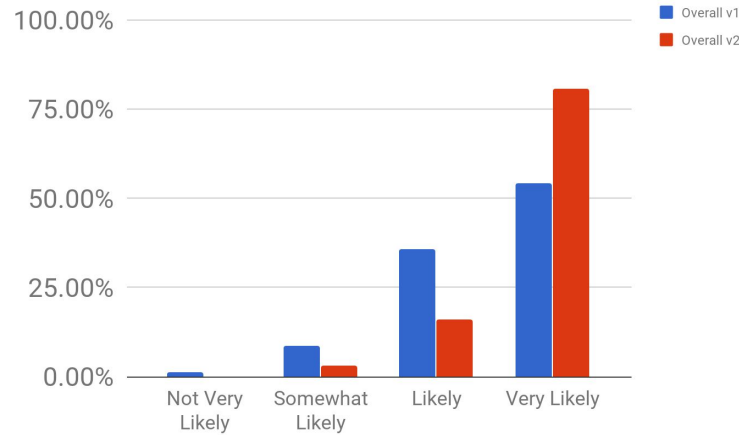


Automation of Breakages

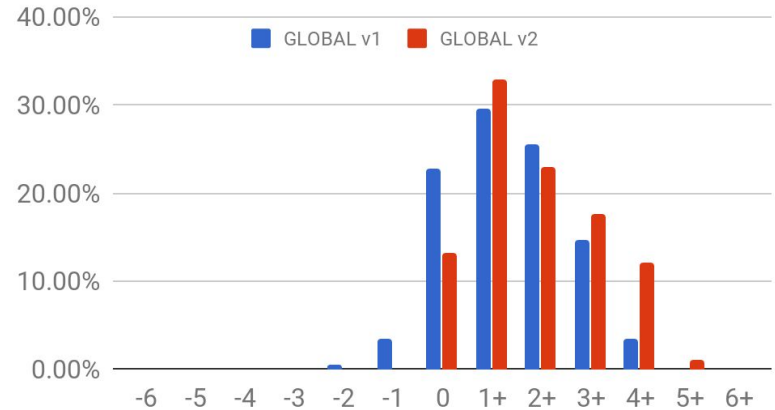
- Breakages are enabled automatically based on class schedule (calendar)
- SRE EDU oncaller is paged if breakage is *not* eating out of SLO fast enough
- Facilitator removes a silence when phones must page
- Students use the normal Google internal tools and have full rights



What Does Our Monitoring Tell Us Now?



How likely to recommend?



Δ self-reported confidence

SRE EDU Orientation V2

- 97% Net Promoter Score (+7 pp vs v1)
- +26 pp increase in 'Very Likely to Recommend'
- 87% of respondents report 1+ increase in confidence (+14 pp vs v1)
- Positive shift in histogram of Δ self-reported confidence

What Does Our Monitoring Tell Us Now?

I went in feeling quite apprehensive & came out feeling like I at least know which way I'm pointed. **Thoroughly enjoyed the breakage activities** and learning about how Google's infra, monitoring and processes fit together.

Delving into real breaking scenarios was super valuable - I would love more of these (1 per day would be amazing).

It was the funnest week I've had this year. Overall, it made me feel **more connected to production** and the technology, which made me really happy.

The breakage scenarios in SRE EDU were awesome.

SRE EDU Orientation v2 is Better Instrumented for Observability



Concrete behaviors *demonstrated*

- Use a system diagram
- Diagnose issues using SRE tools
- Annotate an outage
- Mitigate a realistic production issue
- Find root cause & propose a solution

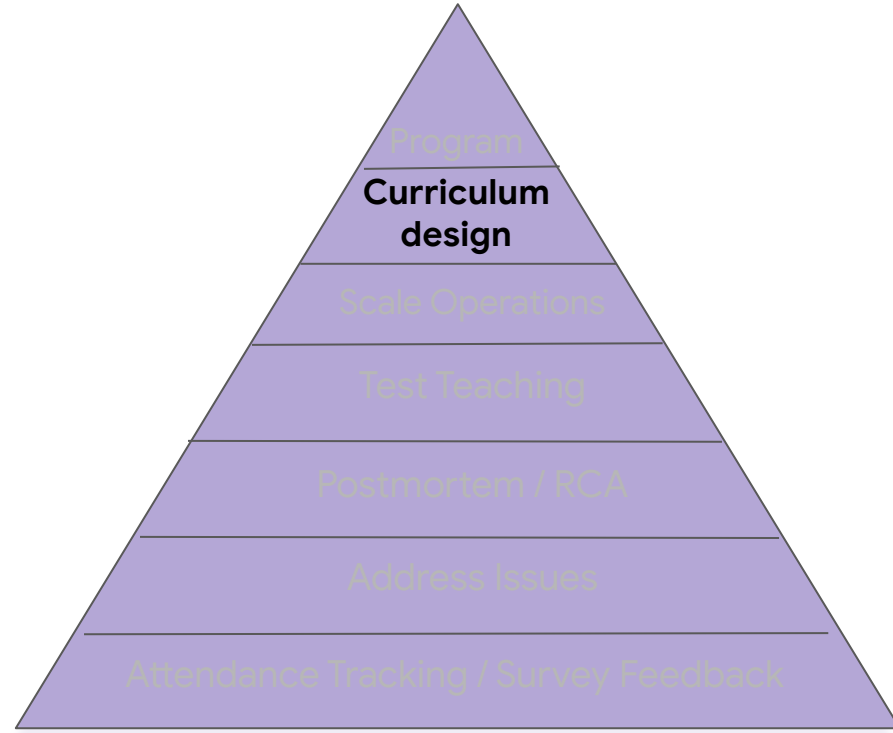
SRE Training: Adapting for Small Companies

- Probably no classes, but self directed and hands on exercises
- Hands on in an environment that looks like a production environment
- Have a script that breaks things
- Plausible story for breakage



Instructional Design Principles for Orgs of All Sizes

- Know your audience
- Consider your culture
- Tell stories
- Define learning objectives
- Use a model for instructional design
i.e. ADDIE



SRE Training Reliability Hierarchy

SRE Training Takeaways

- Training SREs is about **building confidence** and reducing **imposter syndrome** not about a fire hose of information



SRE Training Takeaways

- Hands on exercises → more confidence



SRE Training Takeaways

- The Service Reliability Hierarchy provides a useful framework for building and running an SRE training program.



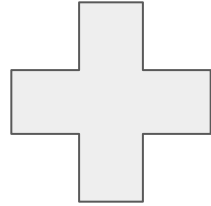
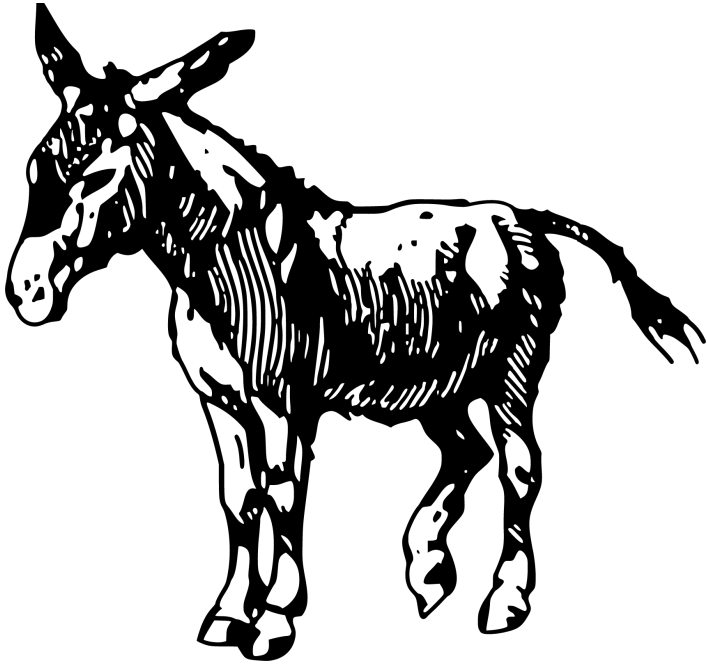
SRE Training Takeaways

- Training SREs is about **building confidence** and reducing **imposter syndrome** not about a fire hose of information
- Hands on exercises → more confidence
- The Service Reliability Hierarchy provides a useful framework for building and running an SRE training program.



Final Words...

ASSBAT



Thanks to the SRE EDU Core Team and All Our Volunteers!

Laura Baum

Program Manager

Benjamin Weaver

Program Mgr



Brad Lipinski

SRE, Software Engineer

Jennifer Petoff

Global Program Mgr & Lead

David Butts

SRE, Software Engineer

JC van Winkel

Lead Educator

Preston Yoshioka

Instructional Designer

Q & A



Jennifer Petoff (aka Dr. J)

Twitter: @jenski

Senior Program Manager and Global Lead, SRE EDU

JC van Winkel

Site Reliability Engineer and Lead Educator, SRE EDU