Optimizing for Learning

Logan McDonald

SRECon Brooklyn

March 27, 2019



👋, I’m Logan!

@_loganmcdonald



✨Emily Griffin✨

@emilywithcurls

story time!



expert intuition

expert intuition
is NOT magic.

expert intuition
is achievable.

“one of the most powerful context-sensitive incredibly adaptive anomaly-detecting and responding agents in the world”

- John Allspaw, “Monitoring Considerations”

preparation

gaining knowledge

mental models

learning together

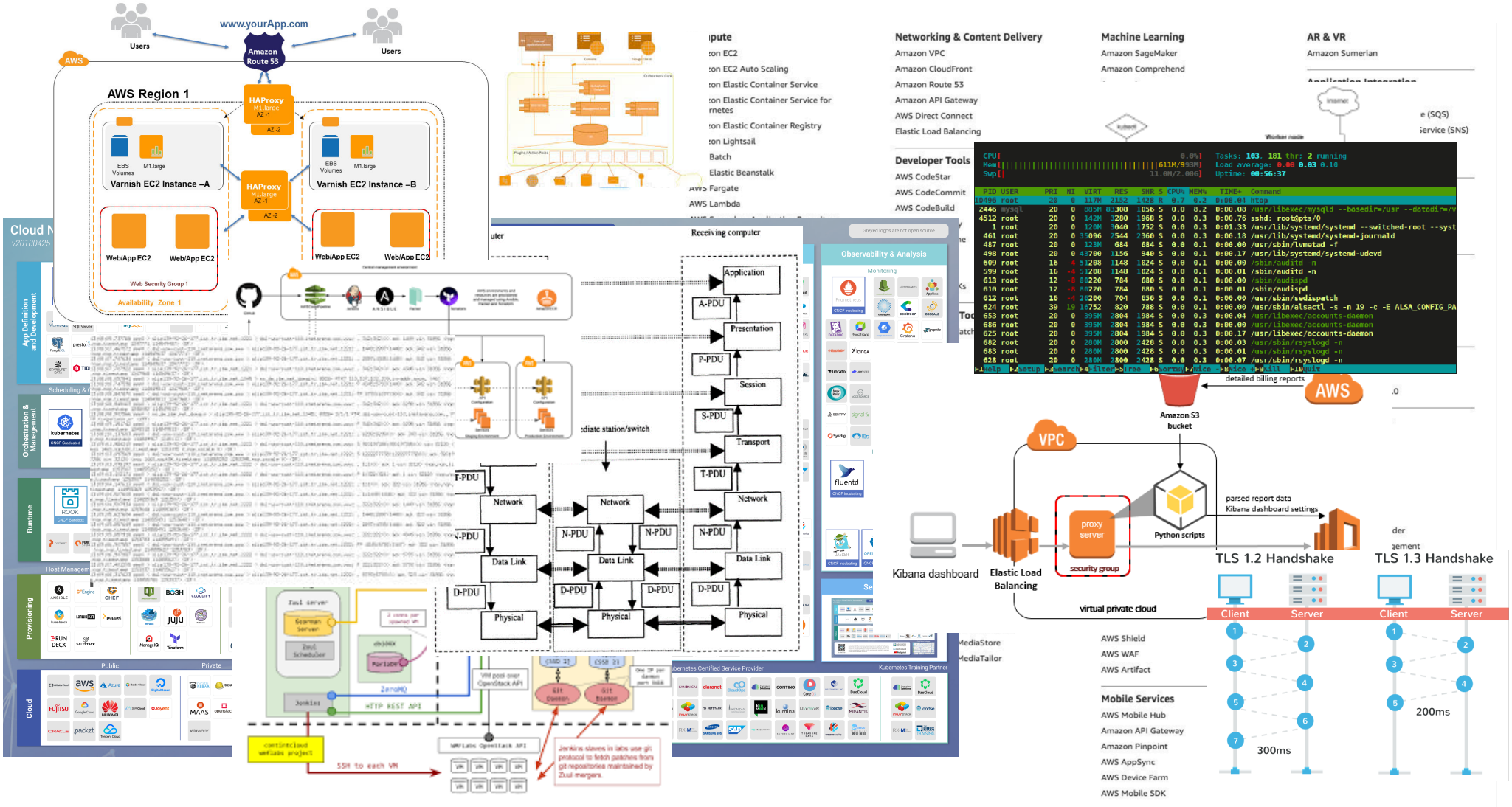
preparation

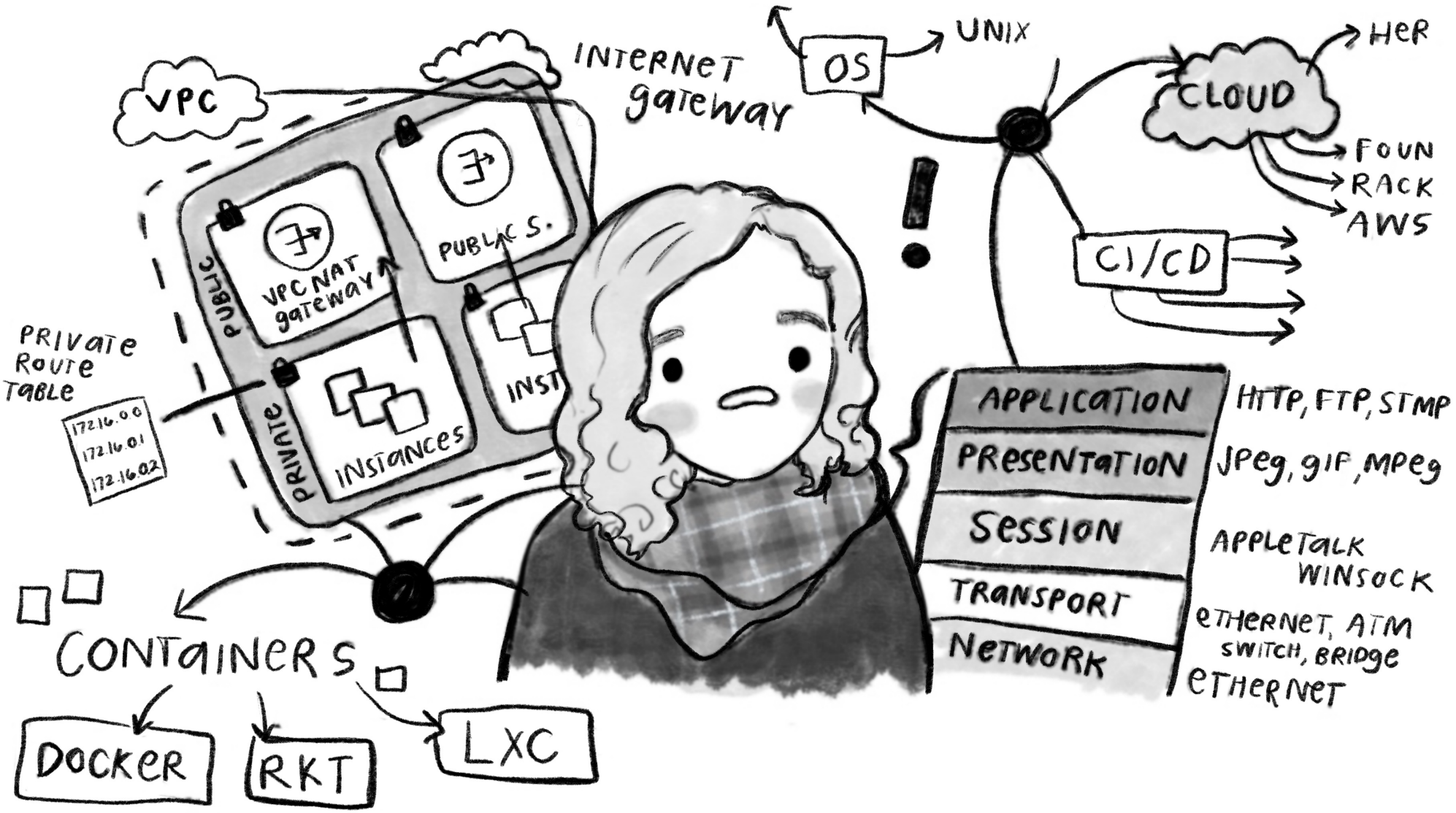
gaining knowledge

mental models

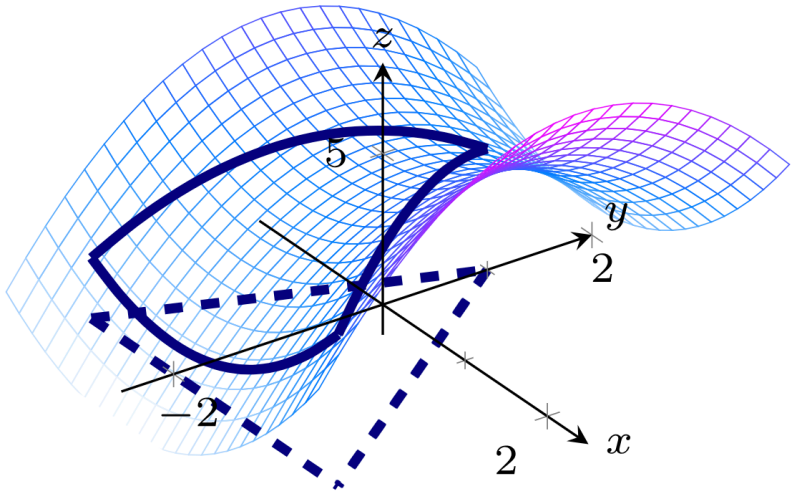
learning together

the nature of the field


www.yourApp.com
Users
Amazon Route 53
AWS
AWS Region 1
HAProxy
M1.large
AZ -1
AZ -2
EBS Volumes
Varnish EC2 Instance –A
Varnish EC2 Instance –B
Web/App EC2
Web Security Group 1
Availability Zone 1
Networking & Content Delivery
Amazon VPC
Amazon CloudFront
Amazon Route 53
Amazon API Gateway
AWS Direct Connect
Elastic Load Balancing
Machine Learning
Amazon SageMaker
Amazon Comprehend
AR & VR
Amazon Sumerian
Developer Tools
AWS CodeStar
AWS CodeCommit
AWS CodeBuild
AWS Fargate
AWS Lambda
Batch
Elastic Beanstalk
Receiving computer
Application
A-PDU
Presentation
P-PDU
Session
S-PDU
Transport
T-PDU
Network
N-PDU
Data Link
D-PDU
Physical
Observability & Analysis
Monitoring
fluentd
Kubernetes Certified Service Provider
Kubernetes Training Partner
Amazon S3 bucket
detailed billing reports
VPC
Kibana dashboard
Elastic Load Balancing
proxy server
security group
Python scripts
parsed report data
Kibana dashboard settings
virtual private cloud
AWS Shield
AWS WAF
AWS Artifact
Mobile Services
AWS Mobile Hub
Amazon API Gateway
Amazon Pinpoint
AWS AppSync
AWS Device Farm
AWS Mobile SDK
TLS 1.2 Handshake
TLS 1.3 Handshake
Client
Server
300ms
200ms
HTTP REST API
SSH to each VM

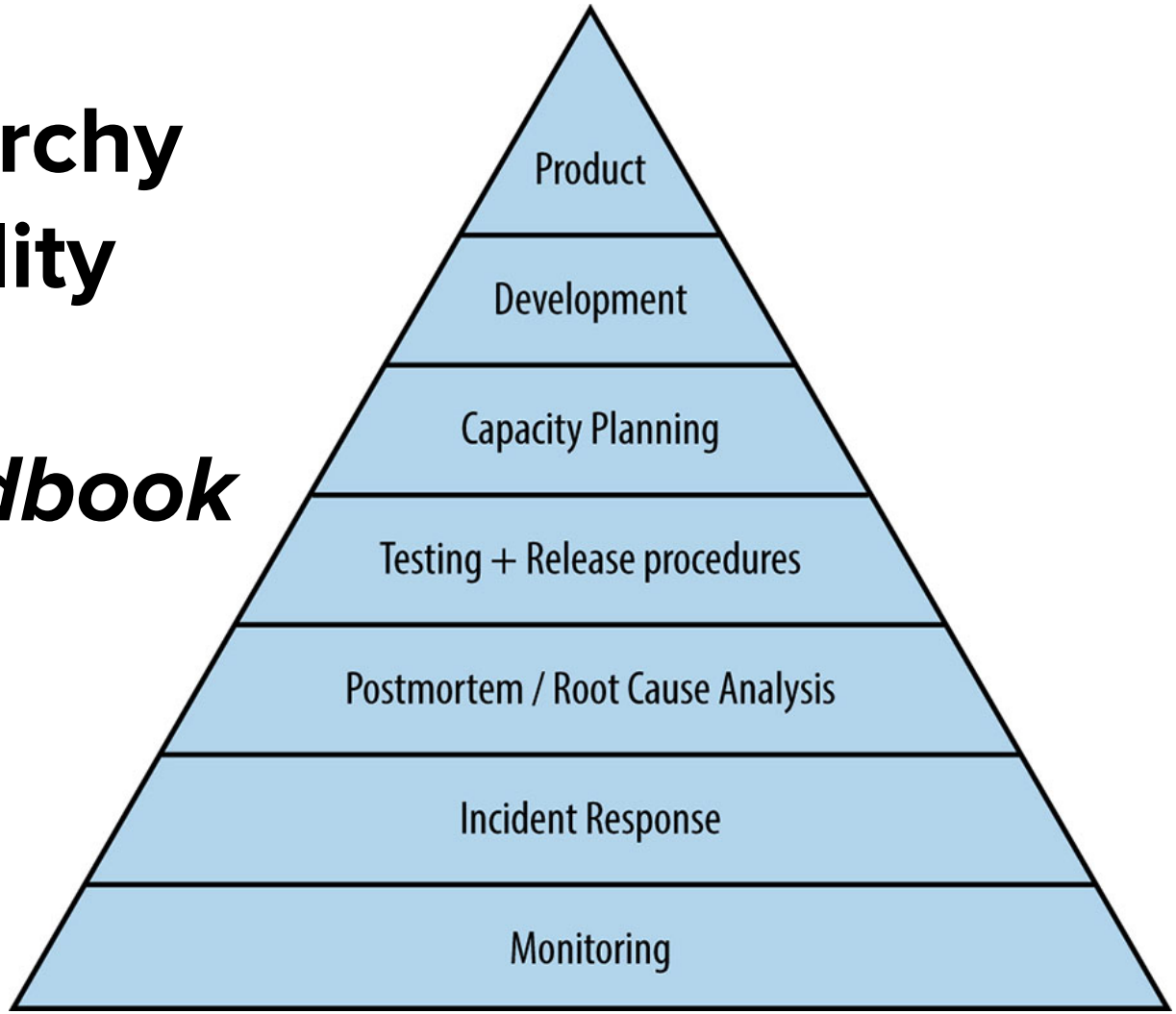

VPC
INTERNET gateway
OS
UNIX
CLOUD
HER
FOUN
RACK
AWS
PUBLIC S.
VPC NAT gateway
PUBLIC
PRIVATE
INSTANCES
INST
PRIVATE ROUTE TABLE
172.16.00
172.16.01
172.16.02
CI/CD
!
APPLICATION
PRESENTATION
SESSION
TRANSPORT
NETWORK
HTTP, FTP, STMP
JPeg, GIF, MPeg
APPLETALK
WINSOCK
ETHERNET, ATM
SWITCH, BRIDGE
ETHERNET
CONTAINERS
DOCKER
RKT
LXC

problem solving is easier with constraints



Dickerson Hierarchy Of Site Reliability

Google SRE Handbook



hierarchies of learning

Robert Gagné's hierarchy of learning

1. Signal learning
2. Stimulus-response learning
3. Chaining
4. Verbal association
5. Discrimination learning
6. Concept learning
7. Rule learning
8. Problem solving

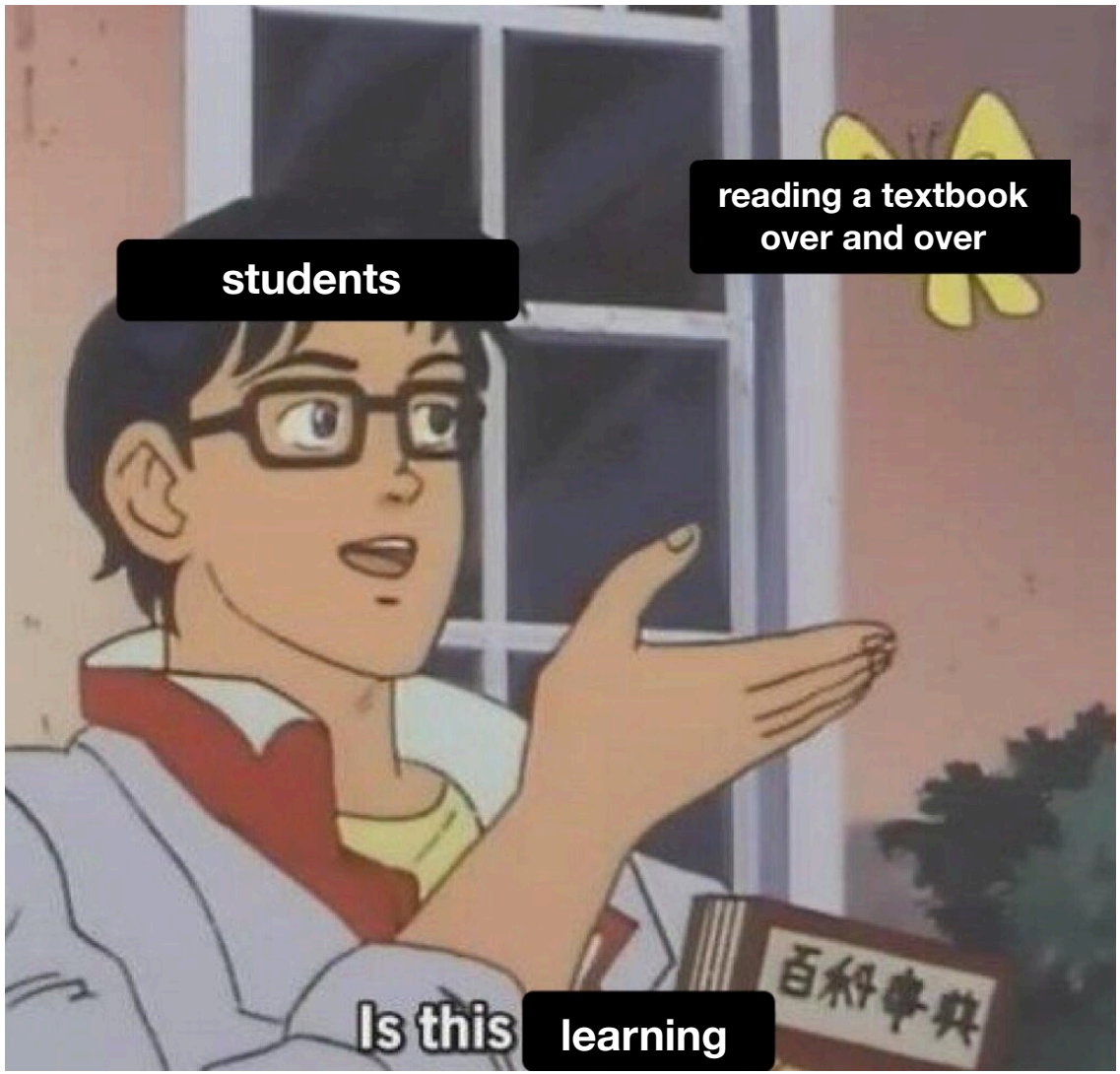
1. Signal learning
2. Stimulus-response learning
3. Chaining
4. Verbal association
5. Discrimination learning
6. Concept learning
7. Rule learning
8. Problem solving

preparation

gaining knowledge

mental models

learning together


students
reading a textbook over and over
Is this
learning
百科事典

low-stakes testing

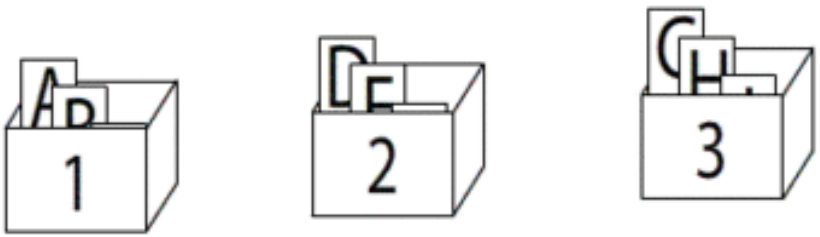
to learn, retrieve

don’t google it
… yet!

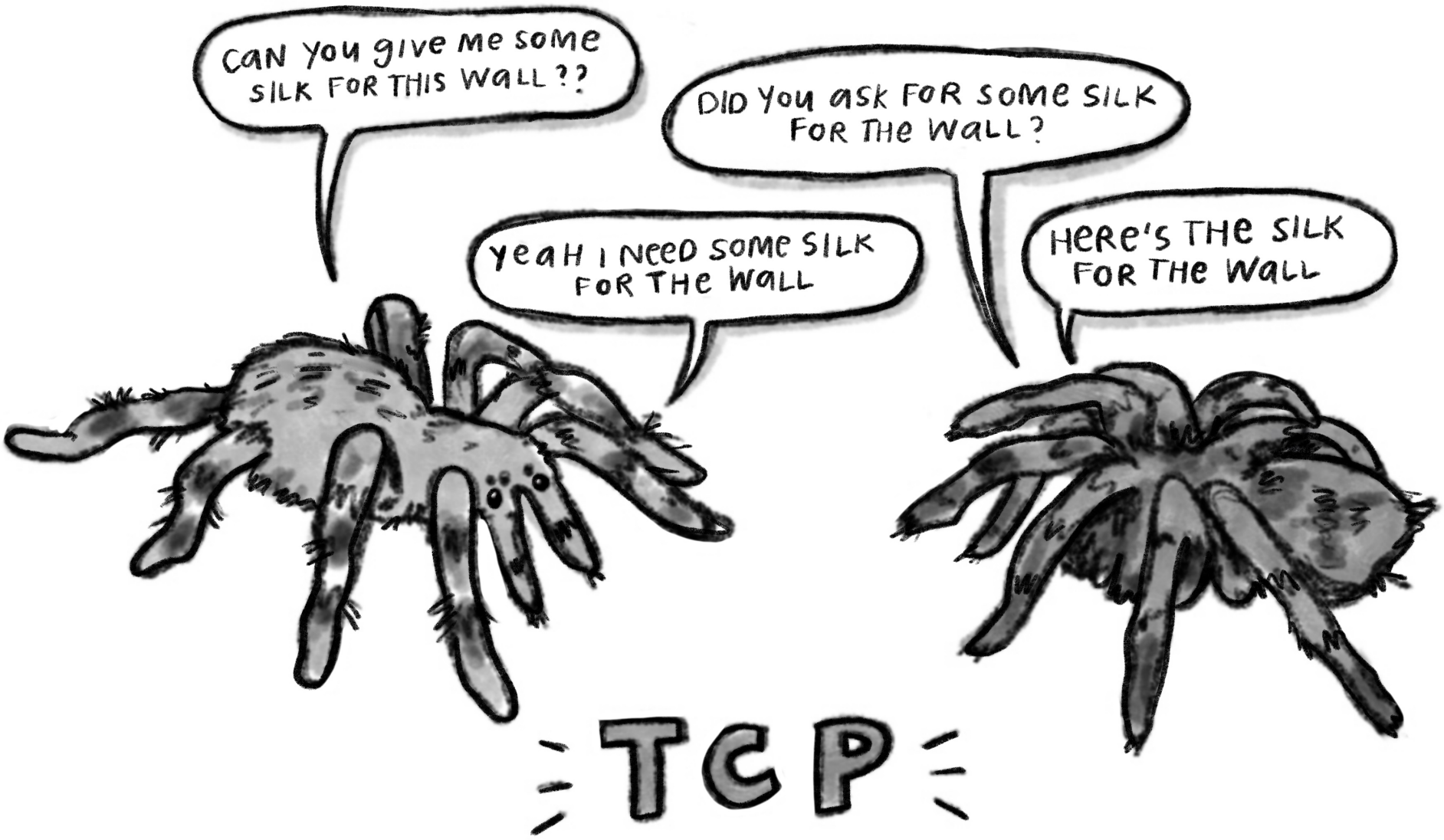
to learn, struggle

delayed retrieval and interleaving

Session 1



memory palaces


CAN YOU GIVE ME SOME SILK FOR THIS WALL??
YEAH I NEED SOME SILK FOR THE WALL
DID YOU ASK FOR SOME SILK FOR THE WALL?
HERE'S THE SILK FOR THE WALL
TCP

preparation

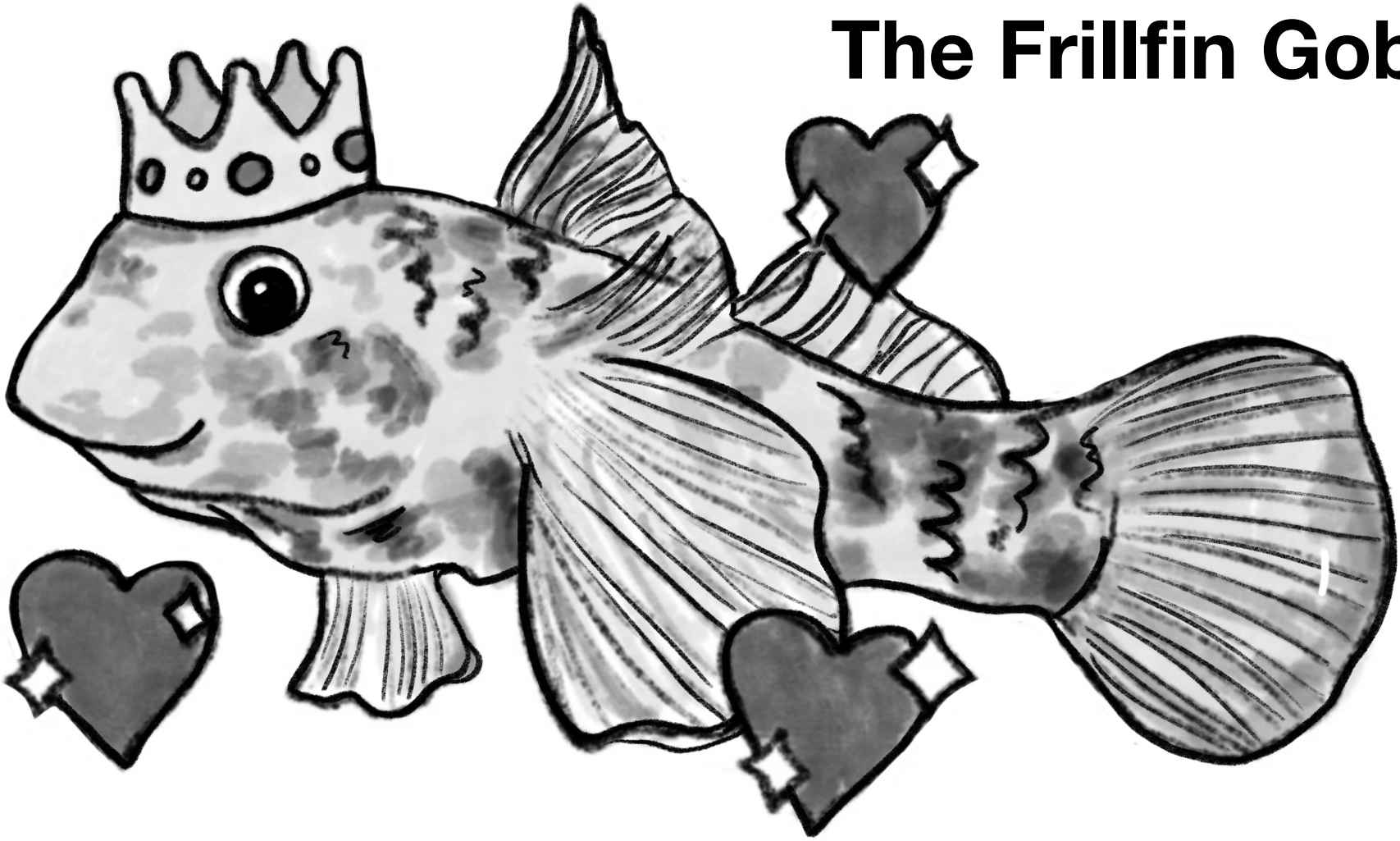
gaining knowledge

mental models

learning together

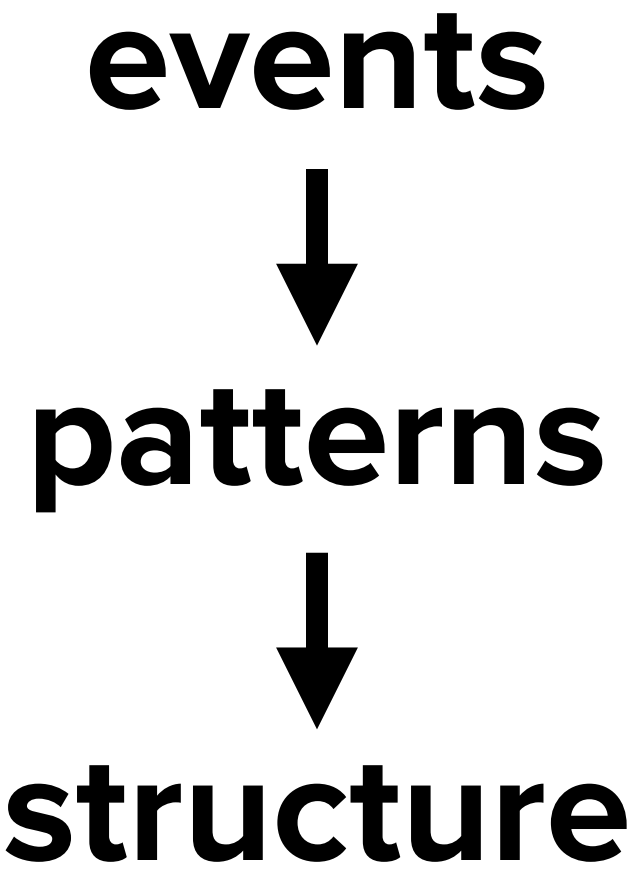
mental models

The Frillfin Goby



storytellers

how do we build mental models?


events
patterns
structure

observability

reflection

incident reviews

beyond singular mental models

preparation

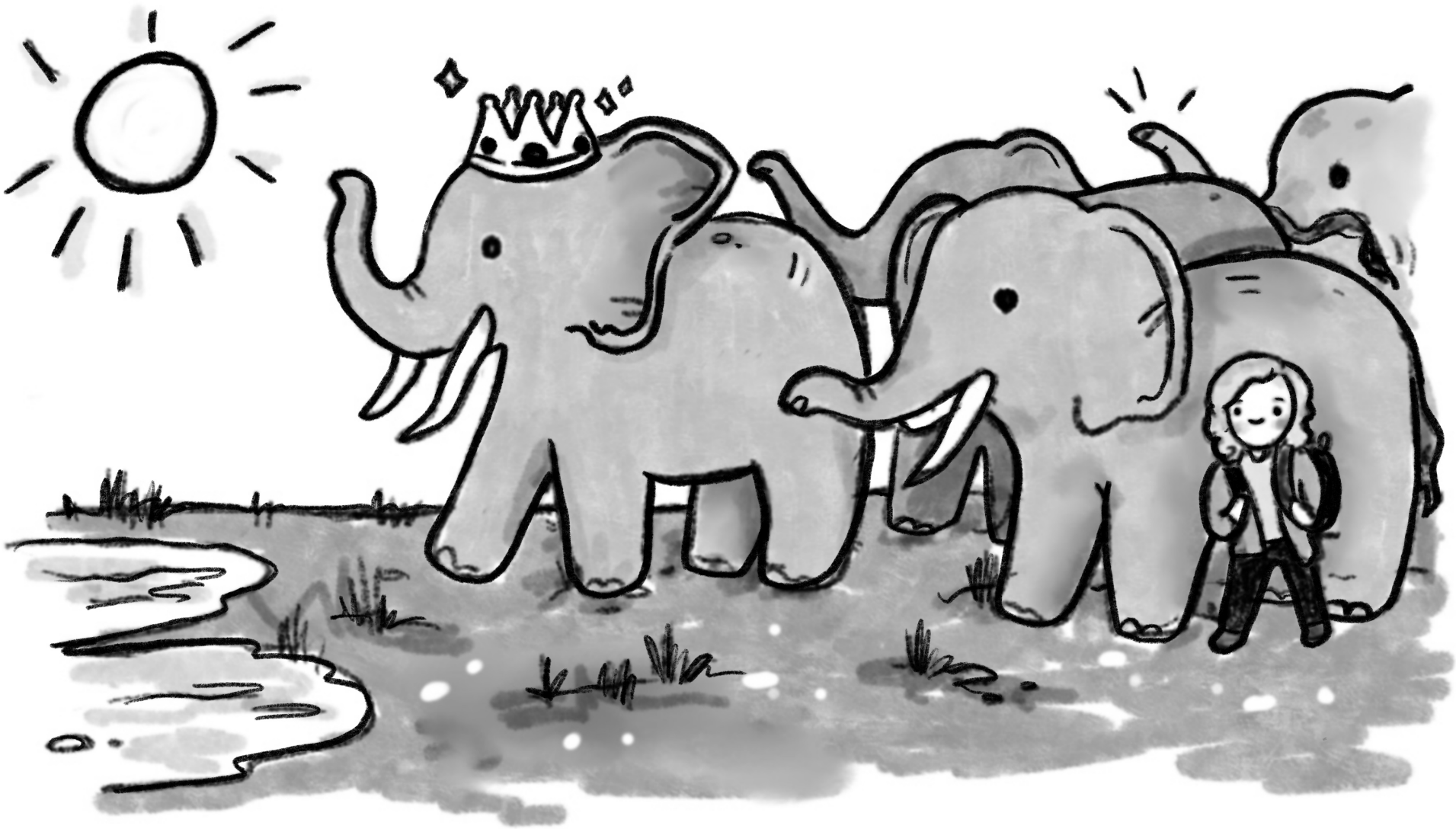
gaining knowledge

mental models

learning together

mnemonic convergence

cultural memory



ROBERT MCMILLAN BUSINESS 10.30.12 05:26 PM

BUZZFEED SURVIVES SANDY OUTAGE WITH INSTANT AMAZON UPGRADE



Photo: JOHN LOPEZ/FLICKR

growth mindset

“Emphasizing natural intelligence takes it out of the child’s control, and it provides no good recipe for responding to failure”

- Carol Dweck

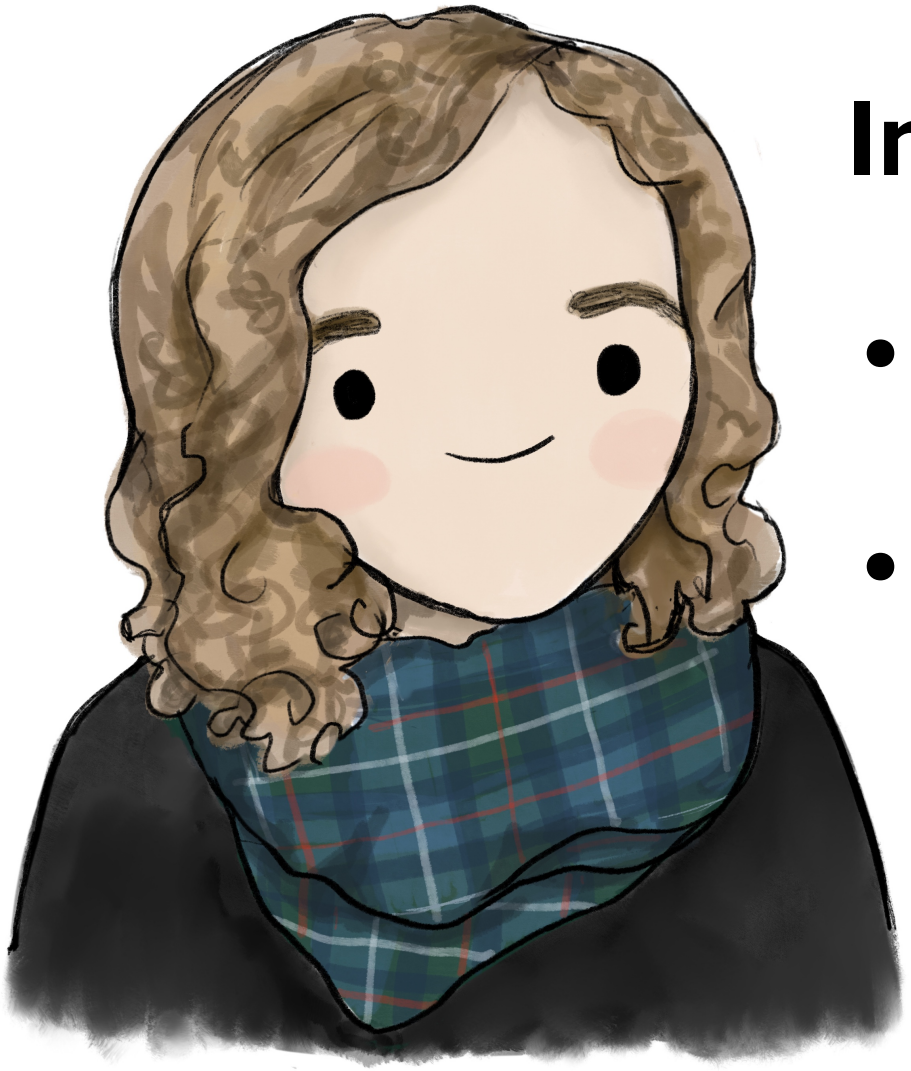
psychological safety

psychological safety

↓

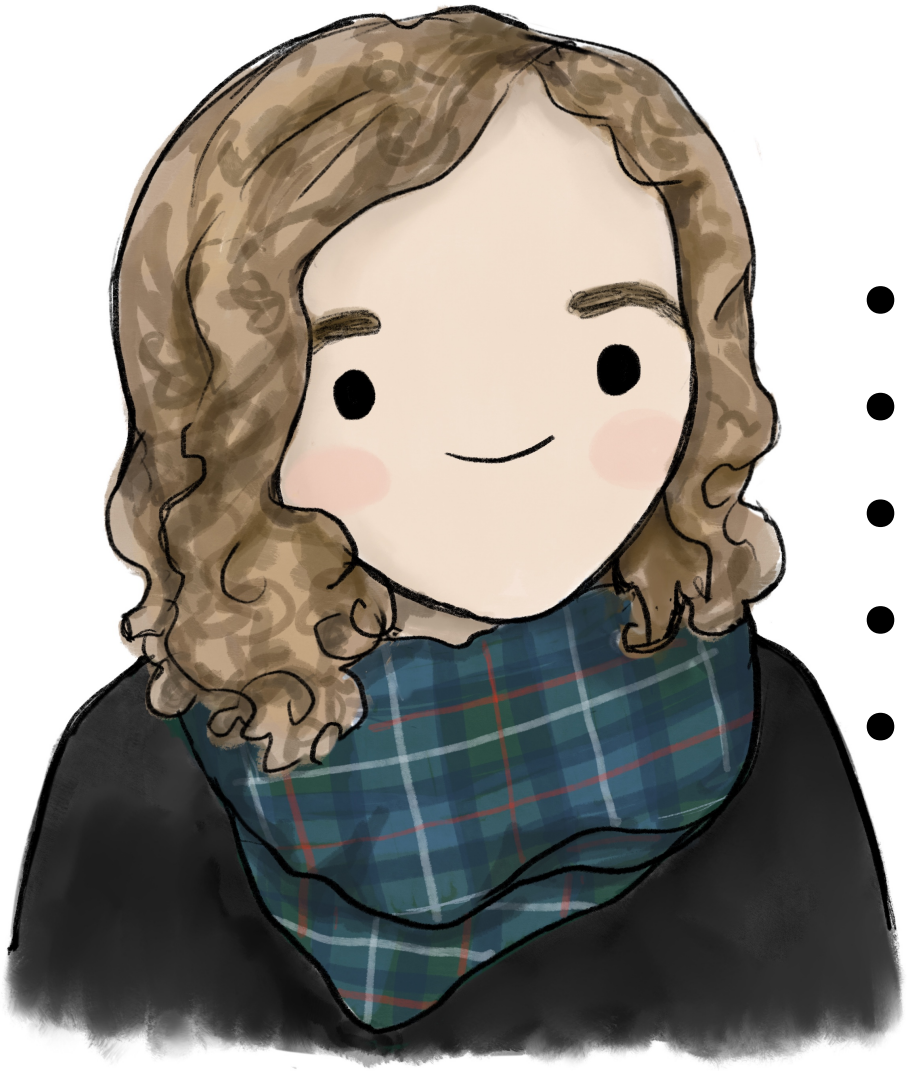
faster incident response





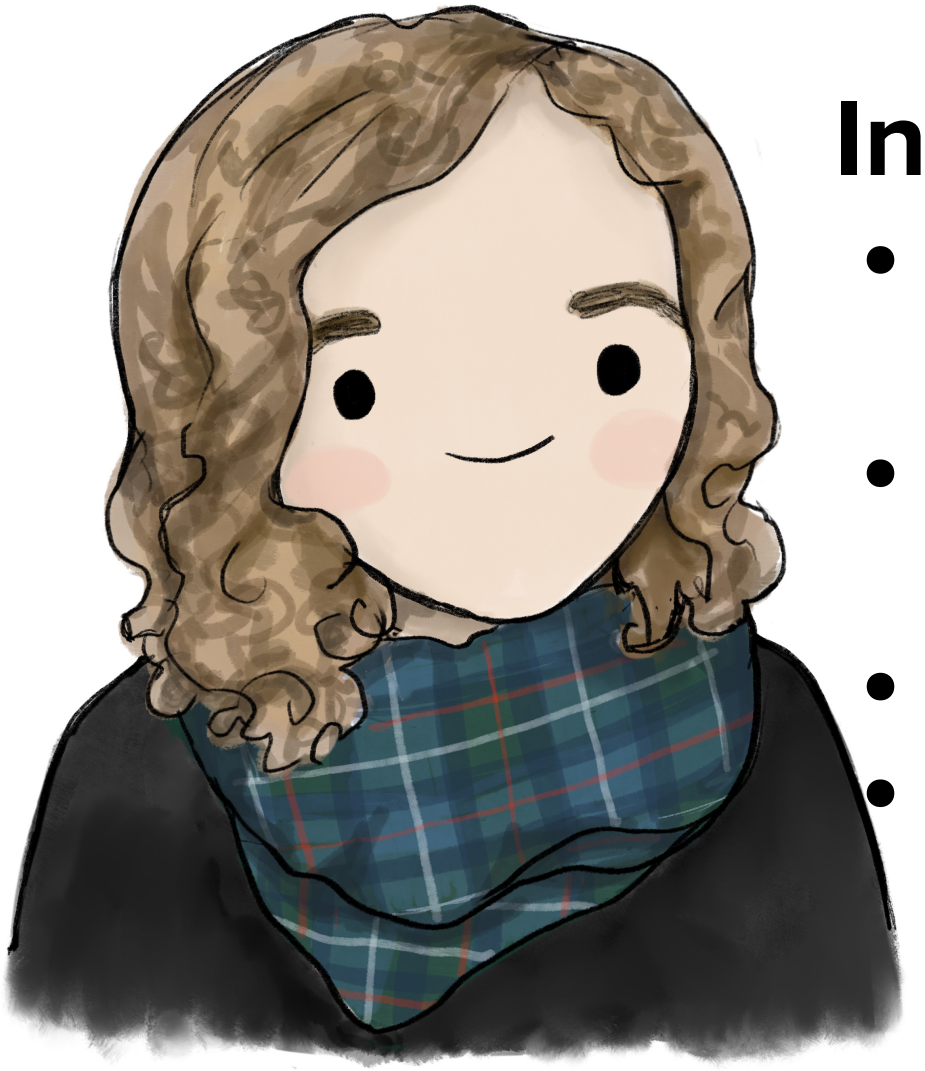
In summary: Prepare!

- **Use Constraint Satisfaction Problems**
- **Lean on the hierarchies of learning**



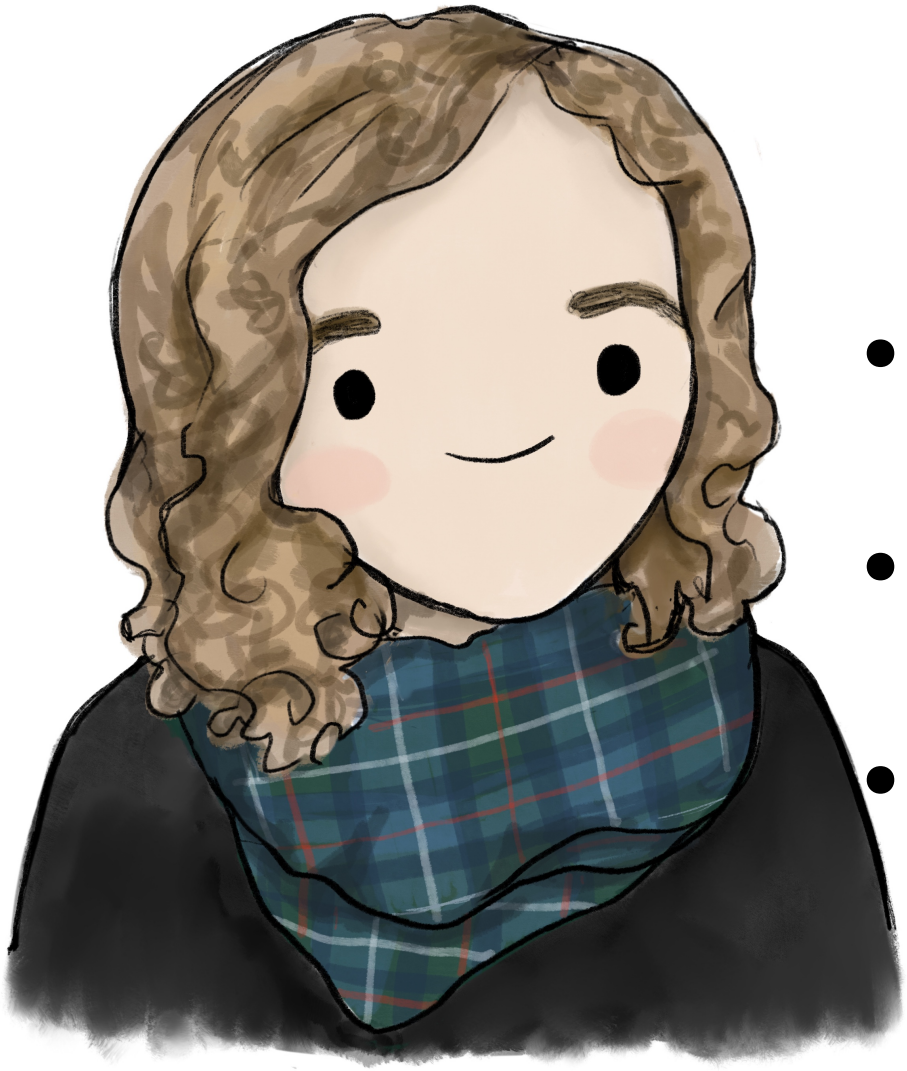
In summary: Study!

- Low-stakes test
- Practice retrieval
- Delay and interleave
- Use the Leitner Boxes
- Build memory palaces



In summary: Abstract!

- Build Frillfin Goby-level mental models
- Events -> Patterns -> Structure
- Observe and reflect
- Experience different types of systems



In summary:
Learn together!

- Embrace cultural memory
- Have a growth mindset
- Build psychologically safe workspaces



Thanks!

@_loganmcdonald