



Outlining

learning objectives and curricula

teach-shiny.rbind.io

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Goal

Write learning objectives
for a Shiny workshop you're likely to teach.

Your turn

- ▶ Go to rstd.io/shiny-wsds-18 and scan the content
- ▶ Who is the intended audience? What is their background? How can you tell?

Think

3_m 00_s

Your turn

- ▶ Go to rstd.io/shiny-wsds-18 and scan the content
- ▶ Who is the intended audience? What is their background? How can you tell?

Pair

2_m 00_s

00 - Welcome

- › Slides: Welcome
- › Demo:
 - › UN Gender Stats Dashboard
 - › Code
 - › Data

01 - Getting started with Shiny

- › Slides: Getting started with Shiny
- › Exercises:
 - › Google index
 - › NHANES apps

02 - Understanding reactivity

- › Slides: Understanding reactivity
- › Exercises:
 - › More NHANES apps
 - › Review

03 - Designing UI

- › Slides: Designing UI
- › Exercises:
 - › Movies apps

04 - Building dashboards

- › Slides: Building dashboards
- › Exercises:
 - › Shiny dashboards
 - › Flexdashboards

rstudio.com/resources/webinars/rstudio-shiny-workshop-2018

These words will make sense to a student with some experience with Shiny, but may not be informative for a complete novice to gauge the level of the class.

know



your

audience

Discussion

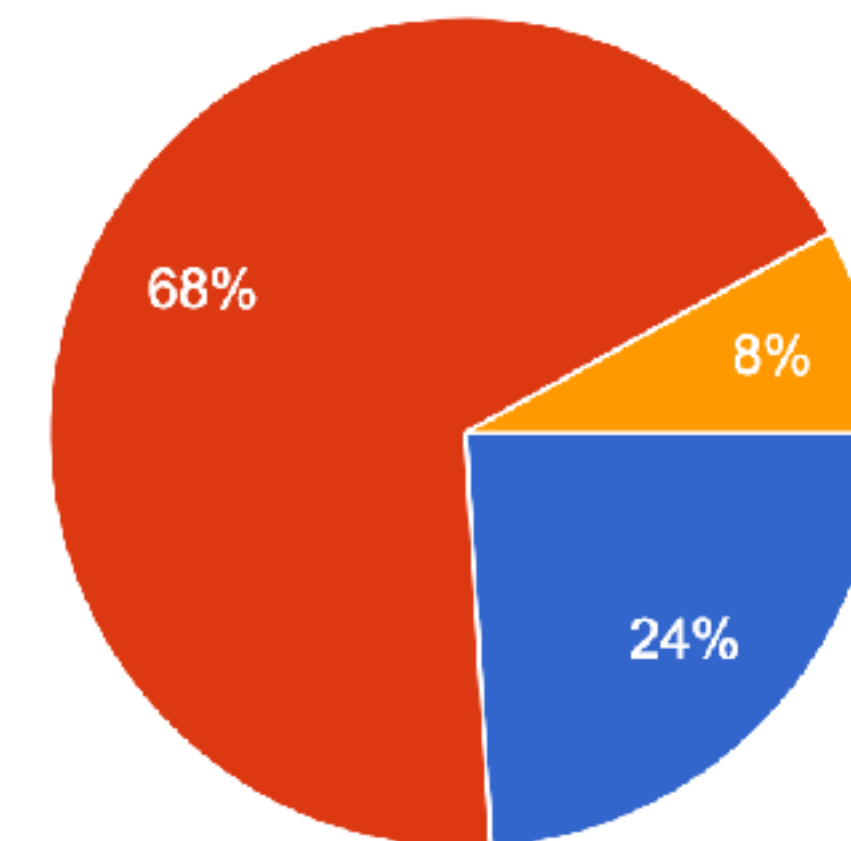
What are some ways you can get to know your audience prior to your workshop?

Pre-workshop survey

- ▶ A pre-workshop survey is helpful, but may not always be feasible
- ▶ It's also not helpful if you're planning a curriculum first, and then pitching it for interest

Have you used RStudio Cloud before?

25 responses



- Yes
- No, I haven't used it, but I have heard of it
- No, I haven't used it, and I have never heard of it

Learner personas

Creating learner personals is a technique borrowed from UI designers, who create short profiles (personas) of typical users to help them think about their audience:

1. background
2. prior knowledge
3. motivations or goal(s)
4. how the course will help them
5. special needs



Meet Jorge

A learner persona for a weekend introduction to programming aimed at college students might be:

1. **Background:** Jorge has just moved from Costa Rica to Canada to study agricultural engineering. He has joined the college soccer team, and is looking forward to learning how to play ice hockey.
2. **Prior knowledge:** Other than using Excel, Word, and the Internet, Jorge's most significant previous experience with computers is helping his sister build a WordPress site for the family business back home in Costa Rica.
3. **Motivations or goal(s):** Jorge needs to measure properties of soil from nearby farms using a handheld device that sends logs in a text format to his computer. Right now, Jorge has to open each file in Excel, crop the first and last points, and calculate an average.
4. **How the course will help them:** This workshop will show Jorge how to write a little Python program to read the data, select the right values from each file, and calculate the required statistics.
5. **Special needs:** Jorge can read English well, but still struggles sometimes to keep up with spoken conversation (especially if it involves a lot of new jargon).




Source: [Ten Quick Tips for Creating an Effective Lesson](#)

Your turn

- ▶ Write three short learner personas for
 - ▶ A Shiny novice
 - ▶ A Shiny expert
 - ▶ A student you expect to encounter at a Shiny workshop you teach

10_m 00_s


Shiny novice



I don't know
what I don't know

1. background
2. prior knowledge
3. motivations or goal(s)
4. how the course will help them
5. special needs

Shiny expert



I know what I
don't know

1. background
2. prior knowledge
3. motivations or goal(s)
4. how the course will help them
5. special needs

Your student



1. background
2. prior knowledge
3. motivations or goal(s)
4. how the course will help them
5. special needs

(January 16, 2019)

Shiny Train-the-Trainer Certification Workshop - 2 Day

This two-day workshop will equip you to teach R effectively. We will draw on RStudio's experience teaching R to recommend tips for designing, teaching, and supporting short R courses.

On Day 1 of the course, you will learn practical activities that you can use immediately to improve your presentation style, learning outcomes, and student engagement. You will leave the class with a cognitive model of learning that you can use to develop your own effective workshops or courses within your organization. The course will also cover how to use RStudio Cloud and its curriculum of tutorials to jump-start your own lessons. On Day 2 of the course, participants will have the option to choose one of two tracks: Teaching the Tidyverse or Teaching Shiny. - Teaching Shiny: Classroom examples will focus on teaching Shiny at the beginner and intermediate levels. The course materials will build on RStudio's Mastering Shiny workshop as well as the upcoming book from the author of the Shiny package, Joe Cheng, and they will cover the entire lifecycle of a Shiny app: build > improving >

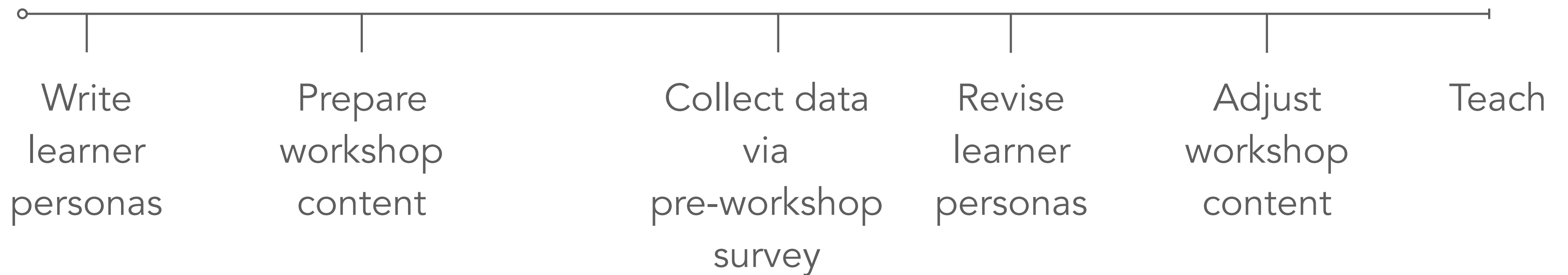
share. Participants will receive the course materials for teaching Mastering Shiny. You should take this workshop if you work as a training partner and want to qualify as an RStudio Certified Shiny Instructor or if you are an advocate for R in your organization. You should be proficient in Shiny already and be prepared to submit examples of your work. Prior teaching experience is helpful, but not required.

Please bring a laptop and a device that has video recording capabilities (such as a laptop or cell phone). Day 1 of the course will be co-taught by Mine Cetinkaya-Rundel and Garrett Grolemund, RStudio Data Scientists and Professional Educators. On Day 2, Mine will teach the Shiny track and Garrett will teach the Tidyverse track.

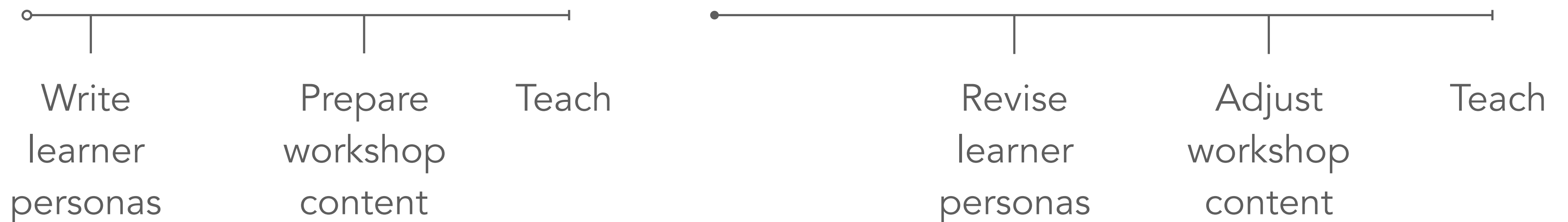
Speakers: [Garrett Grolemund](#), [Mine Çetinkaya-Rundel](#), [Greg Wilson](#)

Planning

pre-workshop
survey feasible



pre-workshop
survey not
feasible



Discussion

I primarily use R for creating reproducible data analysis reports with R Markdown. My only other computing experience is simple website design.

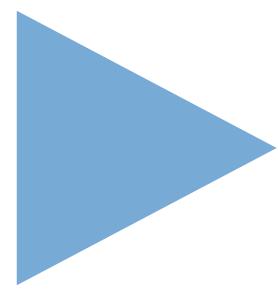


I'm a data scientist who has been using R for 5 years for machine learning. I've never created an R package.



Which (if any) of these pieces of information is more helpful for determining what these students find straightforward / difficult about Shiny?

write



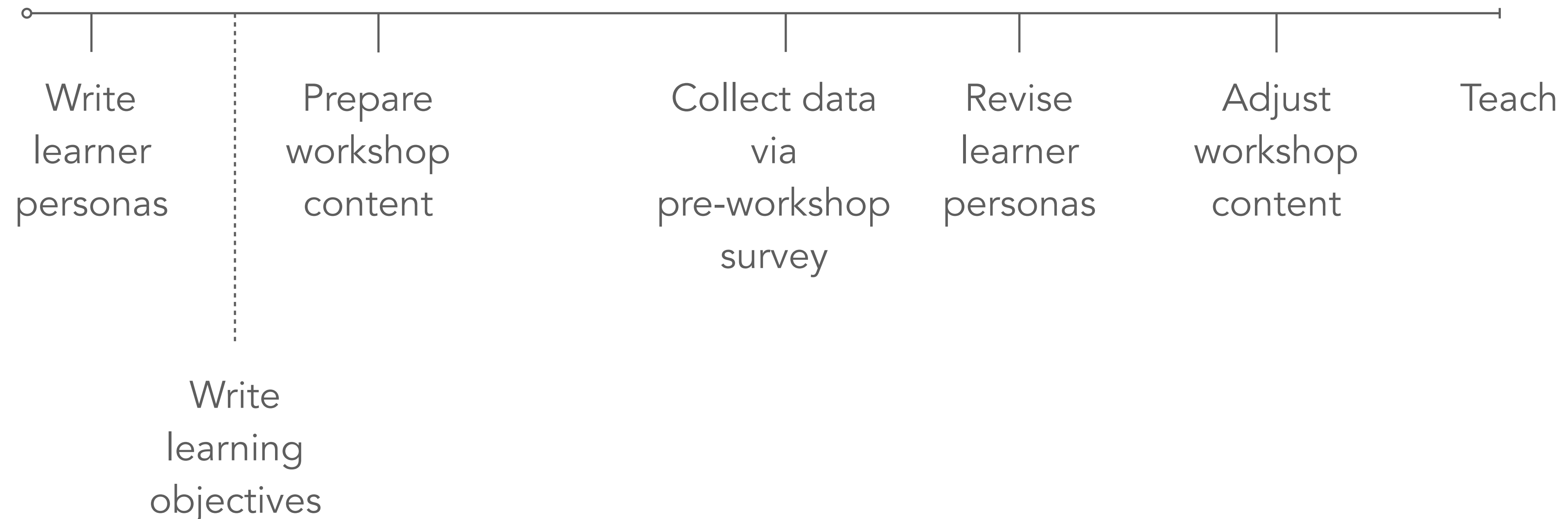
learning

objectives

Learning objectives

- ▶ A learning objective is a goal of a course or lesson stated in a way that is
 - ▶ **clear:** a student should be able to understand
 - ▶ **observable:** a student (and you) should be able to easily check whether or not they have attained the objective
- ▶ A learning outcome is what a course actually achieves

Planning



For whom the LO toll

- ▶ **Students:**
 - ▶ Those who have some experience with Shiny can better understand the content / coverage of the course
 - ▶ Those who are completely new to it can use them as a learning checklist throughout / at the end
- ▶ **Other instructors:** So they can understand / evaluate your course content / coverage at a glance
- ▶ **Yourself:** Keeps you focused and organized

Quiz

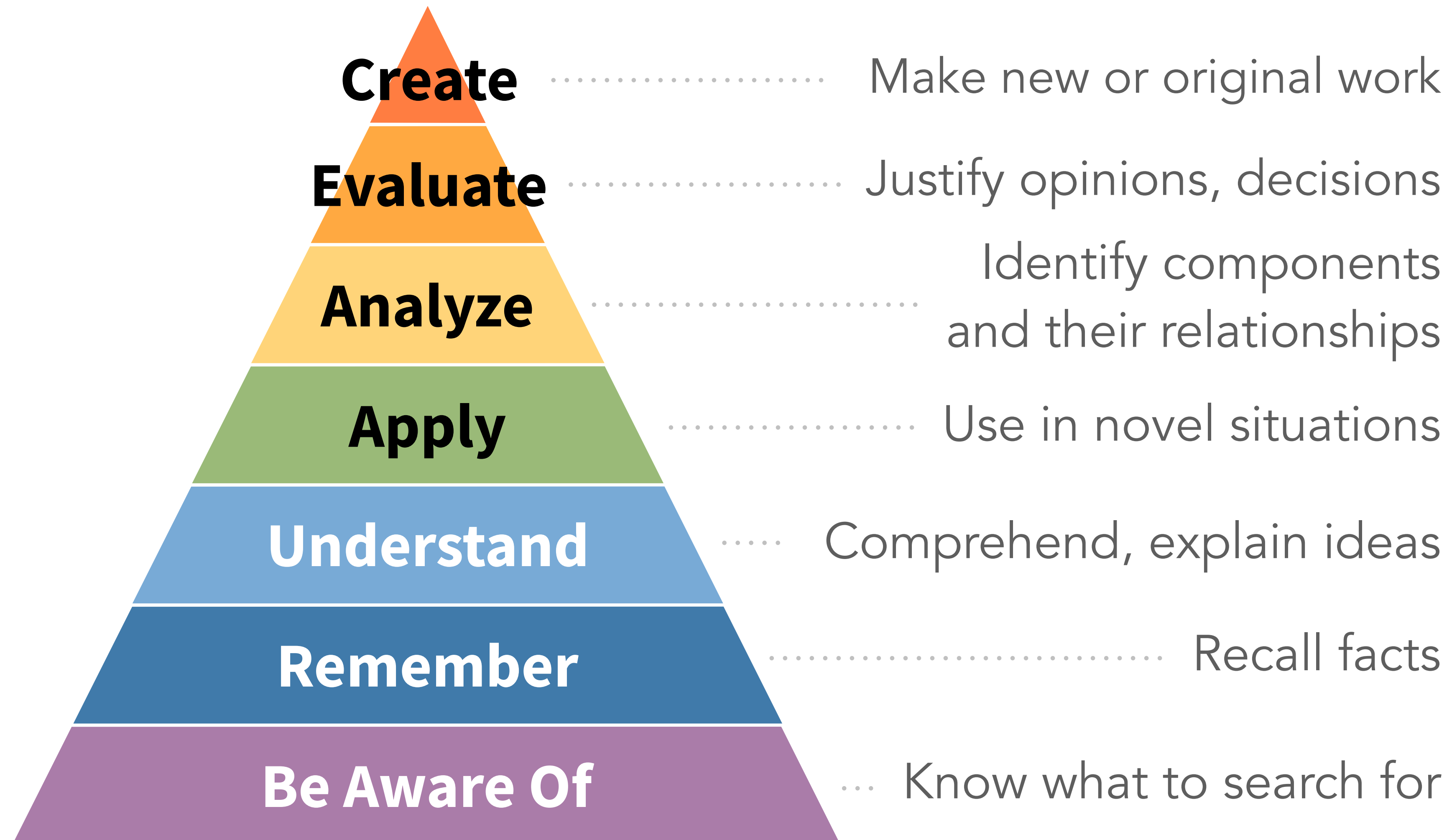
Order the following verbs from Bloom's taxonomy from bottom to top of the pyramid*:

| | |
|-------------|------------|
| analyze | evaluate |
| apply | learn |
| be aware of | remember |
| create | understand |

1_m 00_s

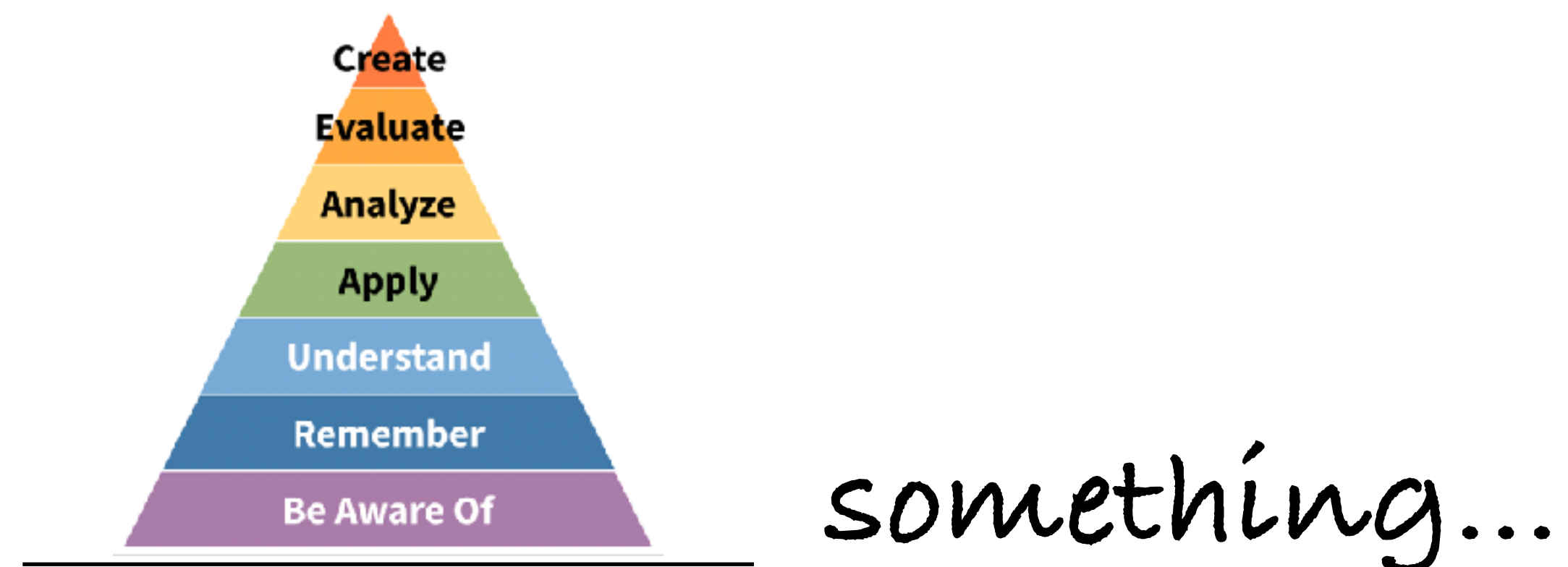
* I don't know why it's called a pyramid, it's a triangle.

Bloom's taxonomy



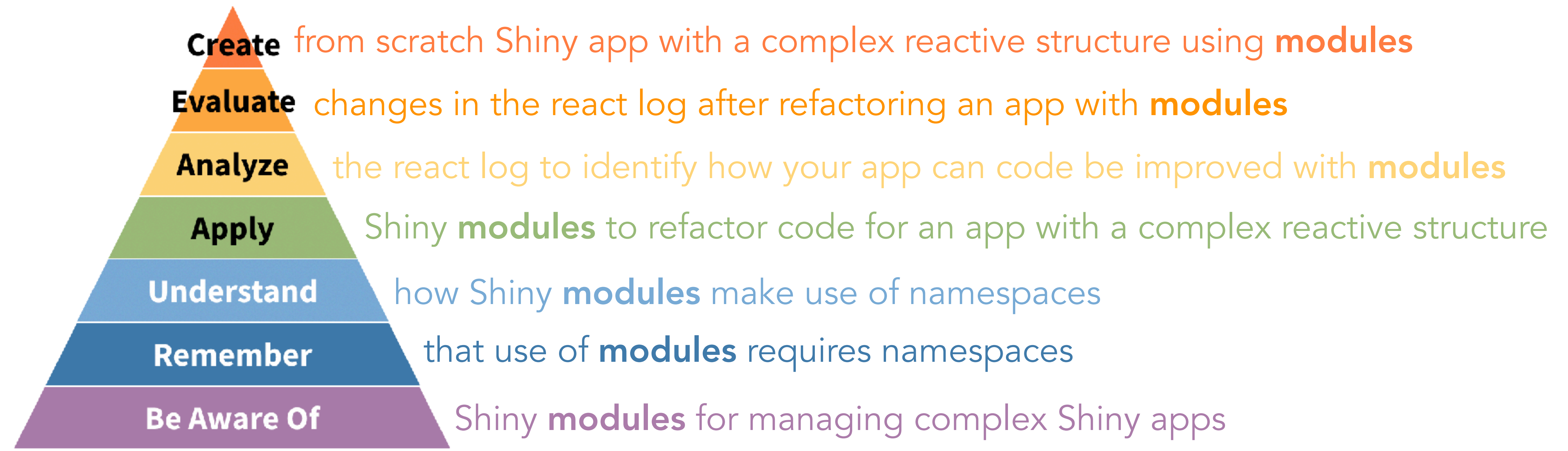
Anatomy of a LO

A traditional approach to writing learning objectives follows the form:

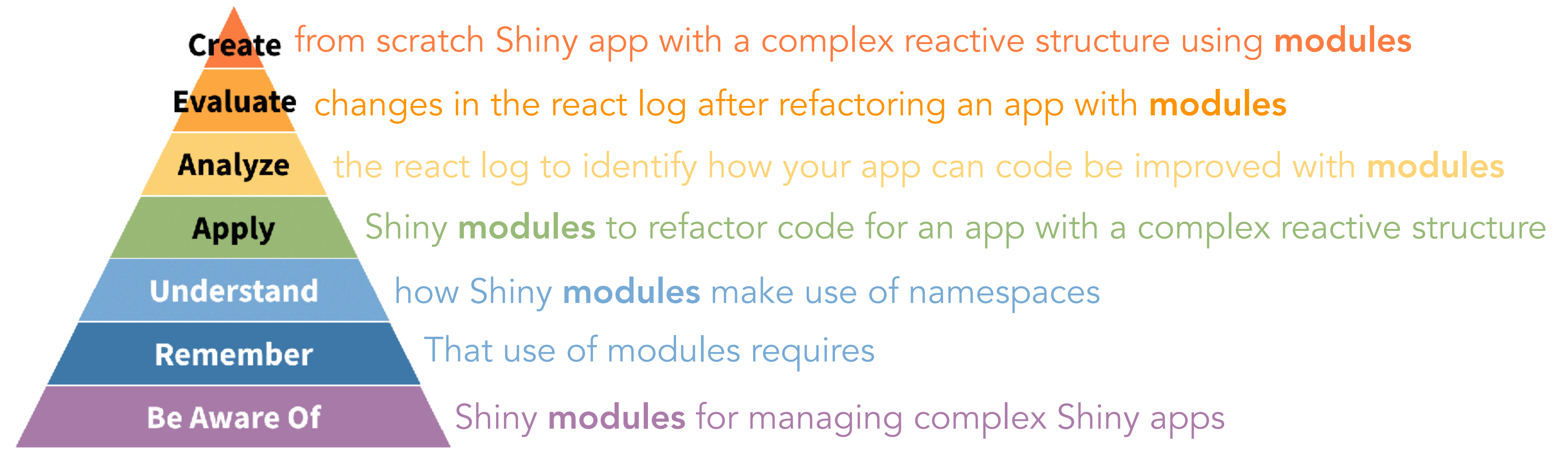


while (IMHO) this is not a hill worth dying on...

it's important to realize that there are **BIG** differences between



and an even bigger difference between



VS.

Learn how to use Shiny modules

Bloom's taxonomy ++

Create

..... Design, Construct, Improve, Adapt, Make, Refactor, Program

Evaluate

..... Check, Choose, Critique, Prove, Rate, Review

Analyze

..... Compare, Contrast, Simplify, Debug, Change

Apply

..... Find, Write, Compute, Use, Plan, Return

Understand

..... Summarize, Predict, Explain, Comment, Complete

Remember

..... Recognize, List, Describe, Name, Find the function

Be Aware Of

Search for, Know where to look, Look up, Find help, Ask

Your turn

- ▶ Improve the following not-so-ideally written learning objectives for the Shiny workshop we considered earlier:
 - ▶ Design a Shiny app from scratch
 - ▶ Understand the essentials of reactive programming in Shiny
 - ▶ Customize reactive objects in your app for better performance
 - ▶ Customize the user interface of your app
 - ▶ Build interactive dashboards
 - ▶ Explore deployment options for sharing your app
- ▶ Note that the workshop assumes experience with R, but not Shiny

Think

5_m 00_s

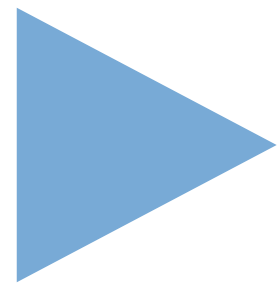
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 - ▶ Customize the user interface of your app
 - ▶ Build interactive dashboards
 - ▶ Explore deployment options for sharing your app
- ▶ Note that the workshop assumes experience with R, but not Shiny

Pair

3_m 00_s

plan



your

time

Discussion

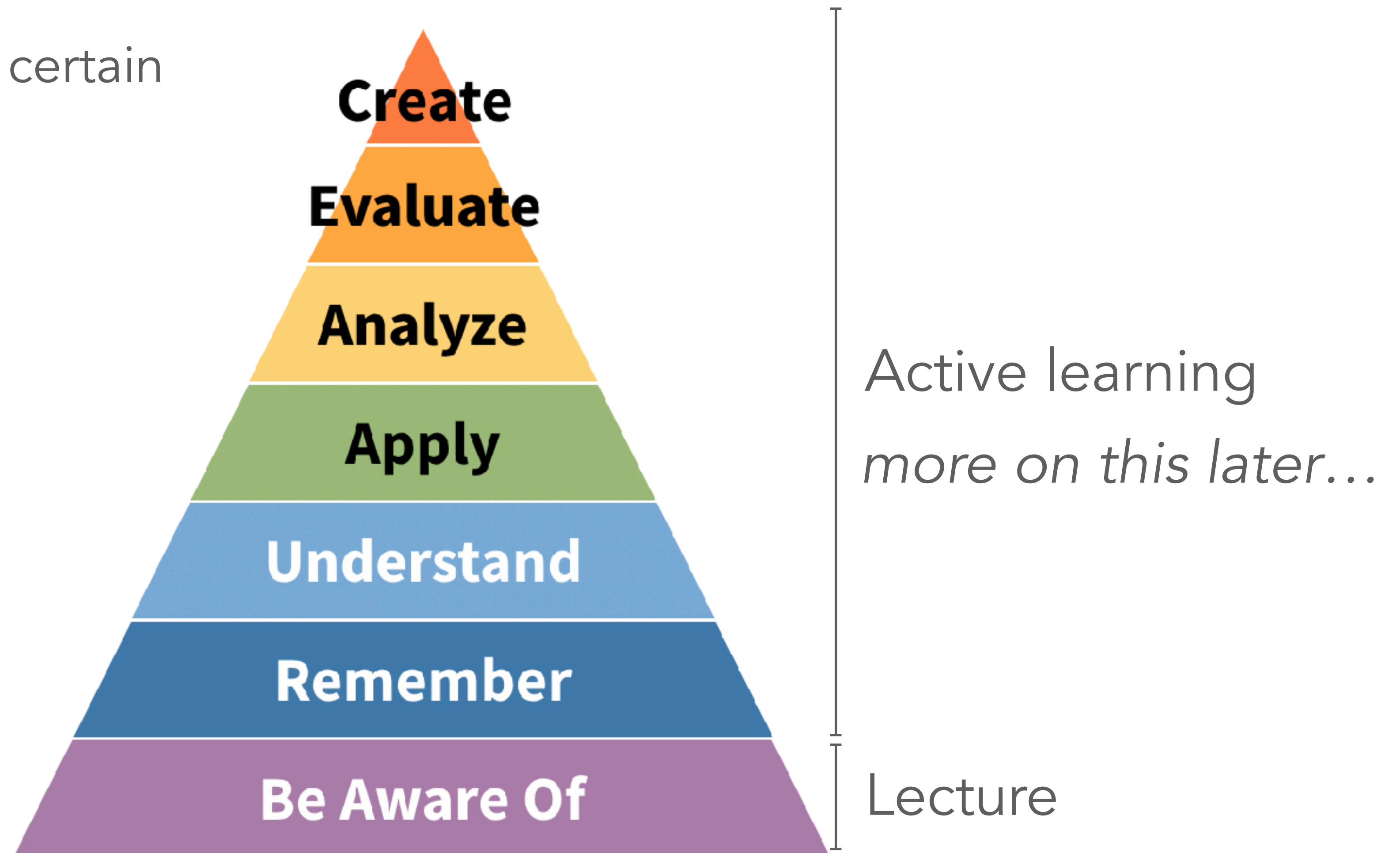
Evaluate whether it's feasible to turn these learning objectives into learning outcomes in a half-day (4 hr, with breaks) workshop.

How does one even start answering this question?

Method of delivery

How long it takes to deliver certain material depends on

- ▶ Topics covered
- ▶ Level of desired mastery



Running out of time

- ▶ Design your curriculum in modules, and skip as needed
- ▶ For each module, have a back up plan for self-study
- ▶ Take a minute to describe how the self-study would work, instead of rushing through the module content

Your turn

- ▶ Suppose for an intermediate Shiny workshop you will teach the following functions:
 - ▶ `eventReactive()`
 - ▶ `invalidateLater()`
 - ▶ `isolate()`
 - ▶ `observeEvent()`
 - ▶ `reactiveFileReader()`
 - ▶ `reactivePoll()`
- ▶ Work in teams to sort this content into modules
- ▶ Tip: You should be able to describe quickly what each module is about

300s

Skip for time

Running out of material

Have in your back pocket:

- ▶ **Open-ended, long activity:**
 - ▶ e.g. build an app from scratch
 - ▶ Can fill as little or as much time as you have
 - ▶ Multi-step:
 - ▶ Step 1: Students who absorbed ~50% of what was taught should be able to complete
 - ▶ Step 2: Students who absorbed everything taught should be able to complete
- ▶ **Office hours:** Use pre/mid workshop survey to collect info on Shiny hurdles your students have come across and use live coding to go through a sample of them

Your turn

- ▶ Write learning objectives for a Shiny workshop for beginners (assume familiarity with R, but not Shiny) for one of the following time periods
 - ▶ 1 hour
 - ▶ 2 hours
 - ▶ half day
 - ▶ full day
 - ▶ 2 days
- ▶ Remember to be clear and observable — include topics and functions/packages
- ▶ Compare your outlines to your teammates

Your turn

- ▶ Work in teams to write learning objectives for a Shiny workshop for beginners (assume familiarity with R, but not Shiny) for one of the following time periods
 - ▶ 1 hour
 - ▶ 2 hours
 - ▶ half day
 - ▶ full day
 - ▶ 2 days
- ▶ Remember to be clear and observable — include topics and functions/packages
- ▶ If you would be willing, submit your LOs as an issue at github.com/rstudio-education/teach-shiny

Sample curricula

rstd.io/shiny-sample-curricula

Slides (Keynote & PDF)
+ apps
for workshops
of various lengths

- ▶ 01-shiny-beginner-1hr
- ▶ 02-shiny-beginner-2hr
- ▶ 03-shiny-beginner-halfday
- ▶ 04-shiny-beginner-1day
- ▶ 05-shiny-intermediary-2day
- ▶ *TBP: keynotes for this workshop*

 **know your audience**

 **write learning objectives**

 **plan your time**

Something to ponder

🤔 What does a curriculum for Shiny for people with no background in R look like?