# R Training Journey

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**Public Health Scotland**

# Background

~350 analytical plus other technical and non-technical roles.

Existing proprietary software / tools e.g. SPSS

Drive for innovation and productivity efficiency

Building capability in R

# Building Capability

Infrastructure – *e.g. software, RStudio Server Pro*

Processes & Standards – *e.g. toolkits, templates, style guide, packages*

Marketing – *e.g. awareness sessions, new product spotlights*

Support – *e.g. IT, user-groups, technical queries channel on Teams*

**Training...**

# Early Training

**Formats**
Online materials
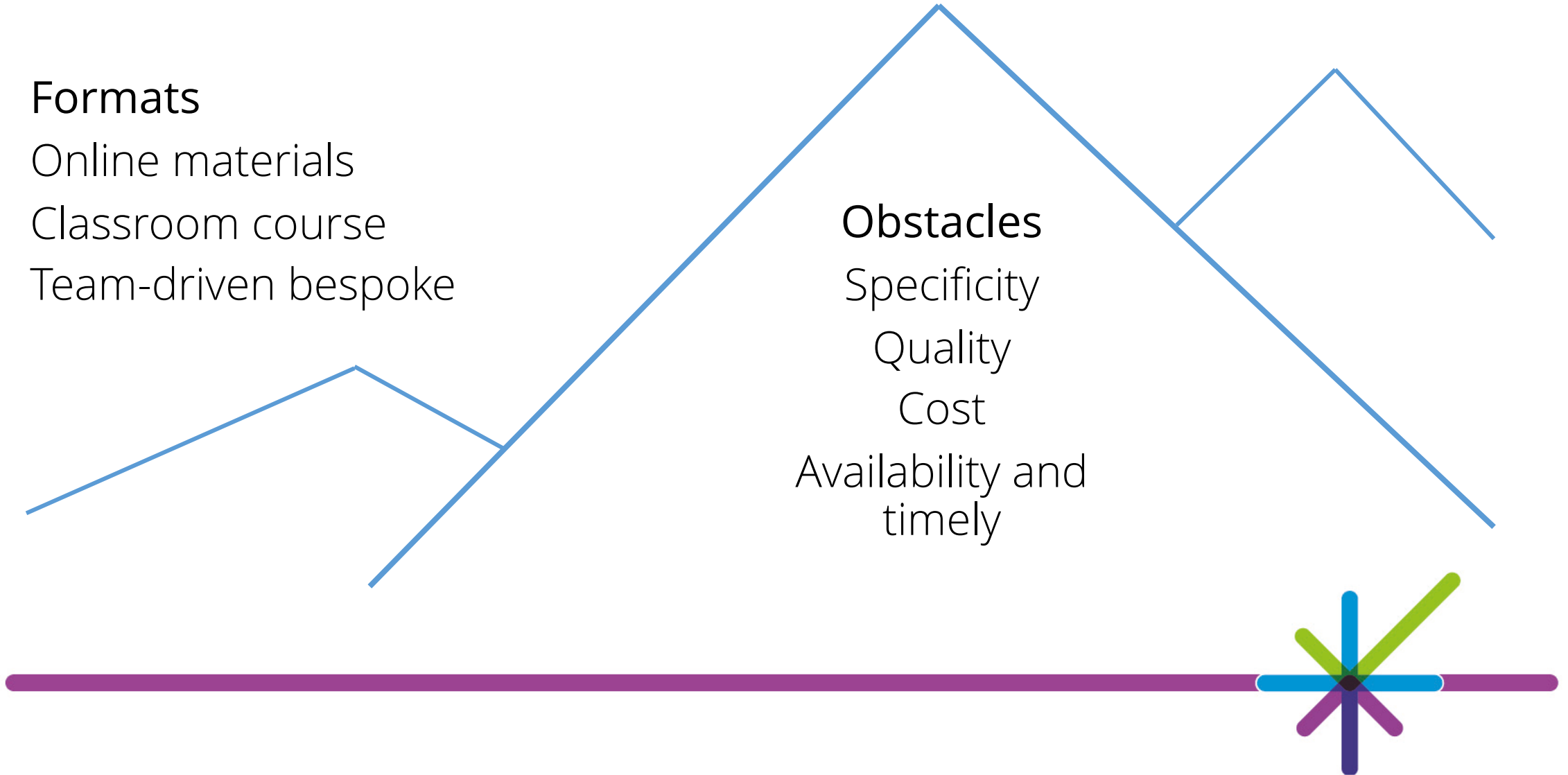Classroom course
Team-driven bespoke

**Obstacles**
Specificity
Quality
Cost
Availability and timely

# Training 2.0

## Review

*Identify key learning objectives and positive aspects from all training sources*

## Refine

*Define learning pathway with specific organisational systems, processes and data*

## Release

*Set up training schedule with group of colleagues, include pre-course checks, project, and post-course drop-in*

# Introductory R Course

**Intro**
*Intro to Data and Tools, Overview of R*

**Foundations**
*Commenting, Types, Variables, Statements, Data Structures, Packages*

**RStudio**
*Desktop/Server Version, Interface, Customisation, R Scripts, Hints/Tips*

**Workflow**
*Overview (Collect, Explore, Wrangle, Viz, Outputs), Git(Hub/ea), RMarkdown, RAP, Templates, Style Guide*

**Wrangle**
*Tidyverse (dplyr/magrittr), Pipes, Functions (Filter, Mutate, Arrange, etc.), PHS Methods*

**Explore**
*Mean, Median, Summary Function, Frequencies/Cross-Tabs*

**Data Flow**
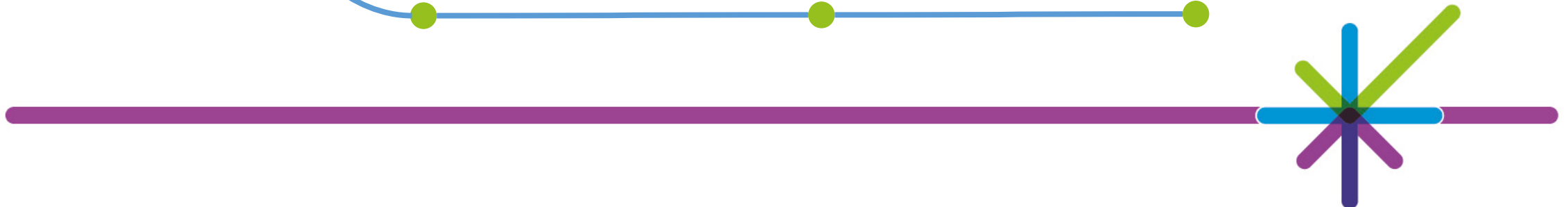*Directories/File Paths, CSVs, SPSS (haven), SMRA/Other Databases*

**Visualise**
*Intro to ggplot2, Line Graphs, Bar Plots, Scatterplots, Customisation*

**Output**
*Overview of RMarkdown, Shiny, etc.*

**Review**
*Overview, Next Steps, Q&A*

# Taking R Further

Self-led, contained topic module examples:

R in PHS
*phsmethods*

Dates & Times
*lubridate*

Testing
*testthat*

SQL in R
*odbc*

Visualisation
*ggplot2*
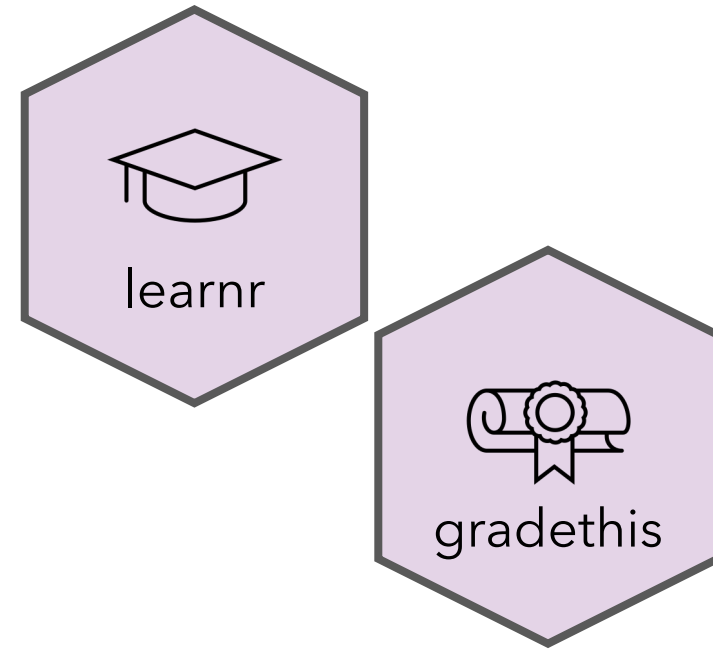
Dashboards
*flexdashboard*

Web Apps
*shiny*

# Training App

- Specific content

- Following style guide and processes

- Timely approach and self-paced

- Includes text, graphics, interactive coding, and quizzes
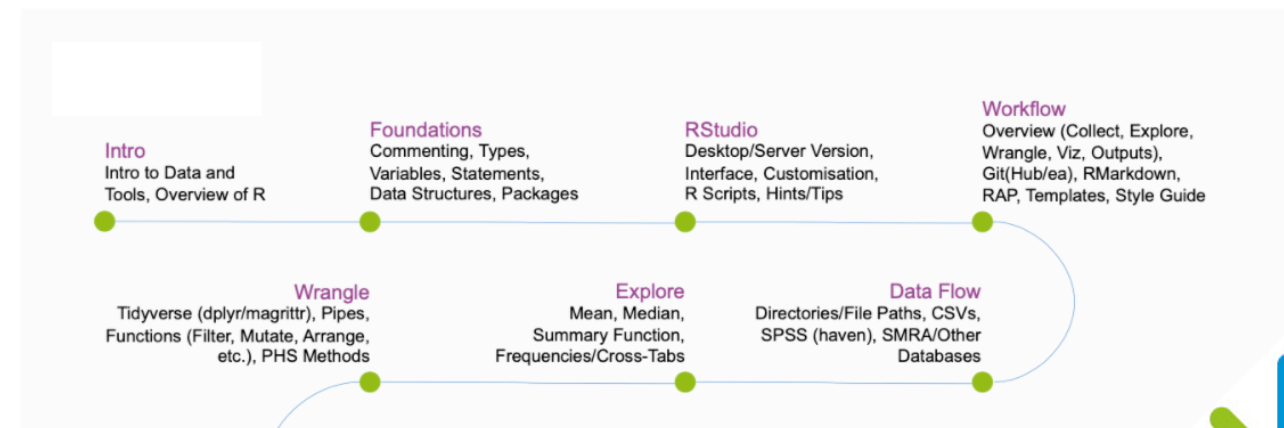
learnr

gradethis

# Intro to R Training App

# Intro to R Training App

```
## Introduction

Welcome to an Introduction to R. This
course is designed as a self-led
introduction to R for anyone in Public
Health Scotland. Throughout this course
there will be quizzes to test your
knowledge and opportunities to modify
and write R code. Below is an overview
of the learning pathway.
```

```r
```{r intro-pathway, echo=FALSE,
fig.align='center', out.width="100%"}

knitr::include_graphics("images/r-
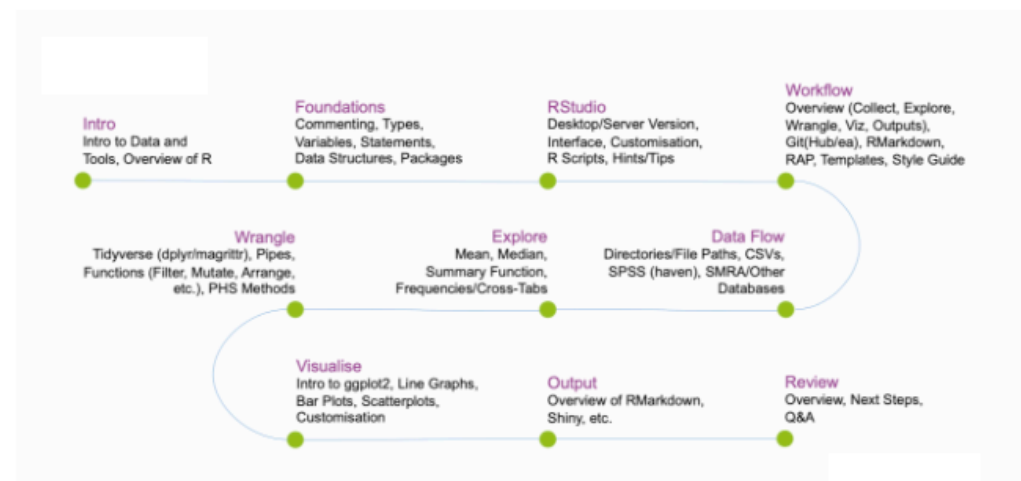intro-pathway.png")

```
```

## Introduction

Welcome to an Introduction to R. This course is designed as a self-led introduction to R for anyone in Public Health Scotland. Throughout this course there will be quizzes to test your knowledge and opportunities to modify and write R code. Below is an overview of the learning pathway.

# Intro to R Training App

```
[...]
question("What will `c('abc', 5, TRUE,
123.5)[3]` return?",

        answer("`TRUE`"),

        answer("`5`"),

        answer("`123.5`"),

        answer("`'123.5'`"),

        answer("`'TRUE'`", correct = TRUE),

        allow_retry = TRUE,

        random_answer_order = TRUE)[...]
```

Quiz

What will `c('abc', 5, TRUE, 123.5)[3]` return?

- ○ 123.5
- ○ 'TRUE'
- ○ 5
- ○ '123.5'
- ○ TRUE

Submit Answer

# Intro to R Training App

```
[...]
question("What will `c('abc', 5, TRUE,
123.5)[3]` return?",

      answer("`TRUE`", message = "Vectors
only hold one basic data type."),

      answer("`5`"),

      answer("`123.5`"),

      answer("`'123.5'`"),

      answer("`'TRUE'`", correct = TRUE),

      allow_retry = TRUE,

      random_answer_order = TRUE)[...]
```

Quiz

What will `c('abc', 5, TRUE, 123.5)[3]` return?

○ 123.5
○ 'TRUE'
○ 5
○ '123.5'
⊙ TRUE

Incorrect

Vectors only hold one basic data type.

Try Again

# Intro to R Training App

Have a look and click 'Run Code' below to see the output. Then, change the code to get R to print "Hello \<your name\>".

```{r foundations-input, exercise=TRUE}
# Hello World example
hello_world <- "Hello World"

print(hello_world)
```

Have a look and click 'Run Code' below to see the output.
Then, change the code to get R to print "Hello <your name>".

| Code | Start Over | | Run Code | Submit Answer |
|------|-----------|---|----------|---------------|

```
1  # Hello World example
2  hello_world <- "Hello World"
3
4  print(hello_world)
```

# Intro to R Training App

```
```{r foundations-input-check}
grade_result(
  pass_if(~ startsWith(.result, "Hello")
      & .result != "Hello World"),
  fail_if(~
      identical(as.character(.result),
      "Hello World"), "Try changing the
      output from Hello World."),
  fail_if(~ TRUE, "Have you entered a
      string to say Hello?"))
```
```



Code    Start Over    ▶ Run Code    ☑ Submit Answer

```
1 # Hello World example
2 hello_world <- "Hello World"
3
4 print(hello_world)
```

[1] "Hello World"

Try changing the output from Hello World. Let's try it again.

# Thanks

- F2F Intro to R Training – *github.com/public-health-scotland/learnr-intro*

- Online Intro to R Training – *scotland.shinyapps.io/phs-learnr-intro*

- Online R Training Code – *github.com/public-health-scotland/learnr-online*

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