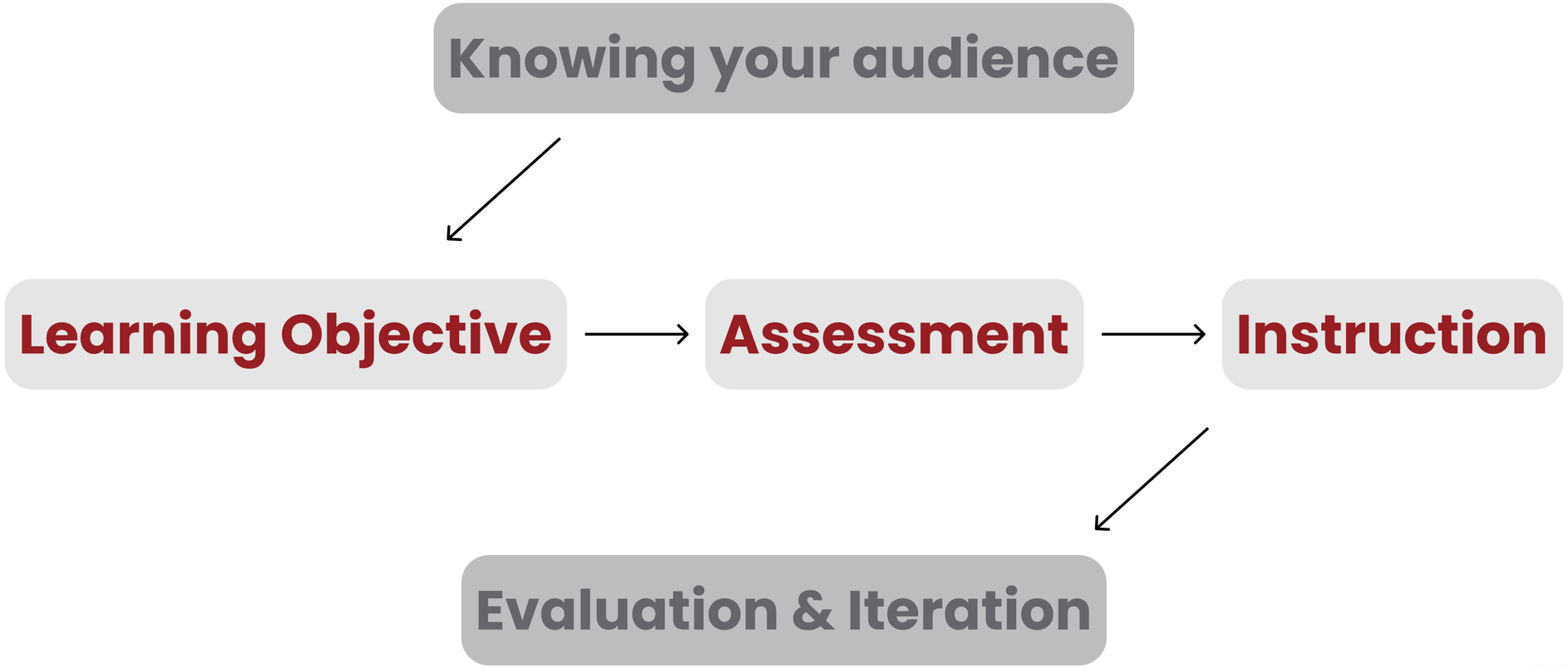
Carnegie Mellon University

Generative AI and course Design

The Gem Show Series III

Sandy Zhao

Course design: the backwards design framework



Carnegie Mellon University

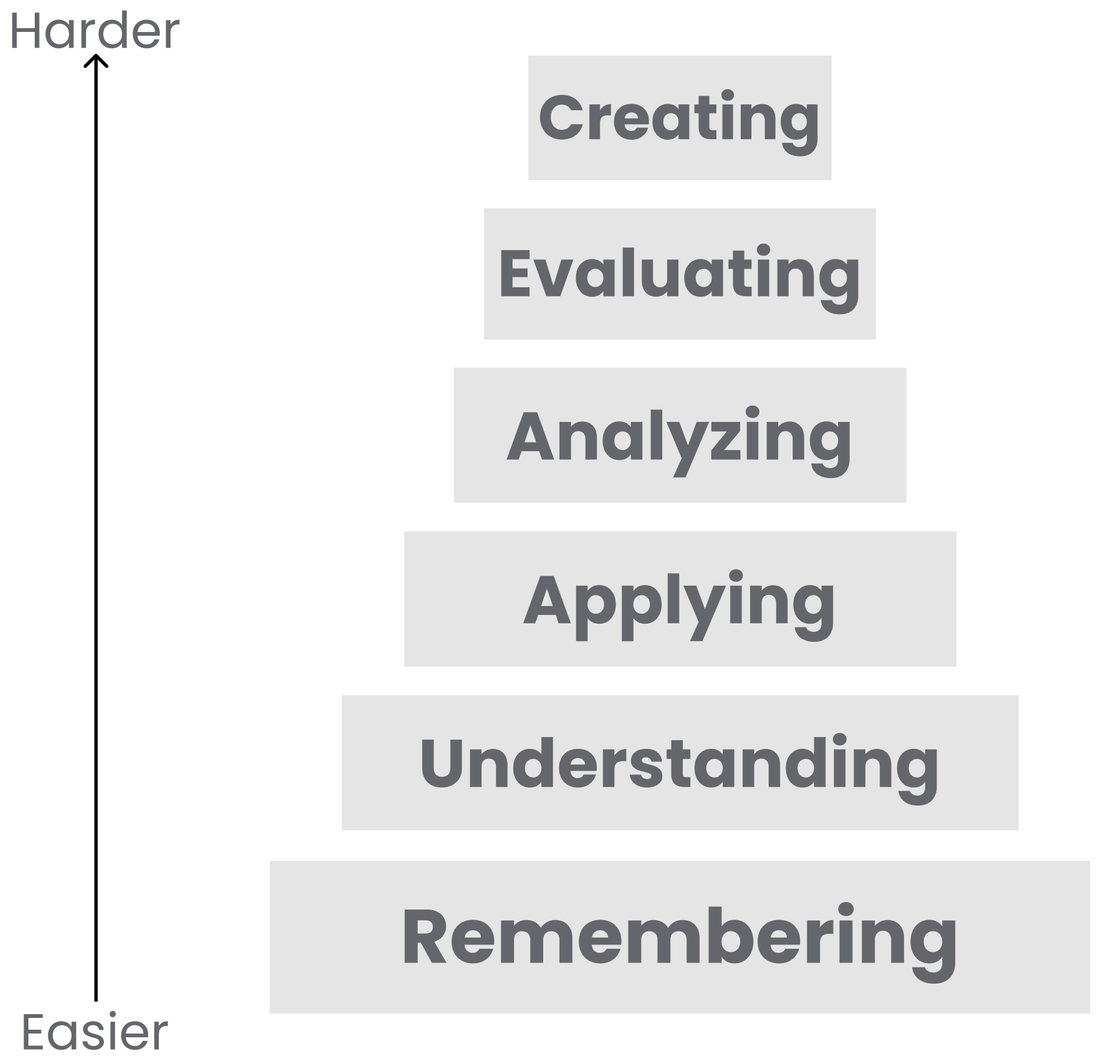
Learning Objective: the destination of the course

Student Centered	Try completing this sentence: “Students will be able to”
Actionable	Start your learning objective with a verb
Measurable	What would student do differently if they achieved the goal

Carnegie Mellon University

Actionable???

Start your learning objective with a **verb**



Carnegie Mellon University

Verbs for Bloom's Taxonomy

Remember	Understand	Apply	Analyze	Evaluate	Create
Arrange	Classify	Calculate	Combine	Appraise	Arrange
Define	Describe	Construct	Figure	Argue	Assemble
Locate	Identify	Demonstrate	Find	Assess	Compose
Recall	Indicate	Estimate	Sketch	Defend	Create
Recite	Organize	Illustrate	Solve	Estimate	Design
Describe	Interpret	Interpret	Predict	Judge	Devise
Repeat	Illustrate	Appraise	Change	Predict	Formulate
Identify	Reorganize	Contrast	Survey	Qualify	Invent
Select	Translate	Criticize	Compare	Rate	Manage
Quote	Paraphrase	Diagnose	Diagram	Support	Modify
Label	Summarize	Identify	Examine	Critique	Organize
Copy	Transform	Classify	Test	Recommend	Plan
List	Discuss		Modify		Prepare
Name	Explain				Produce
State	Defend				Propose
	Compare				Set Up
	Report				Verify
	Restate				Construct
	Review				Develop
	Rewrite				

Carnegie Mellon University

Can you help me create a **learning objective** for a course that aims at teaching **students new to computer coding** to print the statement "Hello world?" I need the learning objective to be **student centered, actionable and measureable**. I need the course to reach the apply level on **bloom's taxonomy**, and please write the learning objective using the appropriate **verb** from the verb PDF that CMU recommended.(link)

"Students will be able to execute a basic computer program that prints the statement "Hello, world!" by writing and running a script in a programming language of their choice."

Carnegie Mellon University

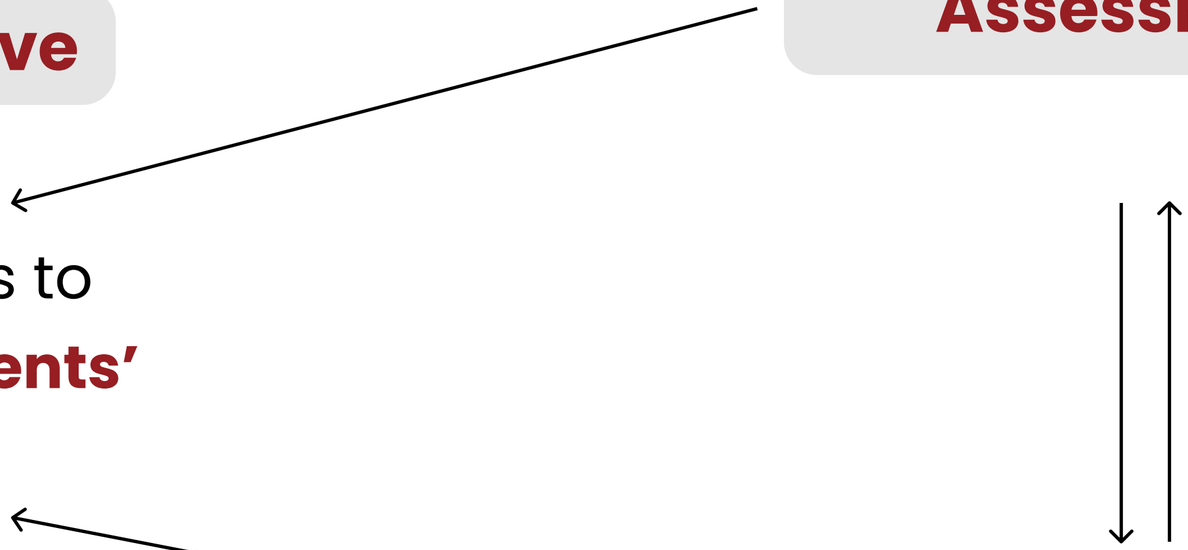
“**Apply** strategies to **encourage students’ independence**”

Carnegie Mellon University

Alignment is key

Learning Objective

Assessment



"**Apply** strategies to **encourage students' independence**"

Instruction

Carnegie Mellon University

Using GPT to ensure alignment

GPT as QA:

After composing some content, send the content in for GPT examination

USING GPT as composing tool:

- **chain of thought prompting**

"Walk through the steps of how you would ensure alignment between the learning objectives, the assessments, and the instructional strategies, explaining your reasoning at each step. "

Carnegie Mellon University

- **Backward Design Prompting**

“Design the final assessment, then the instructional strategies and activities that will prepare students for that assessment.”

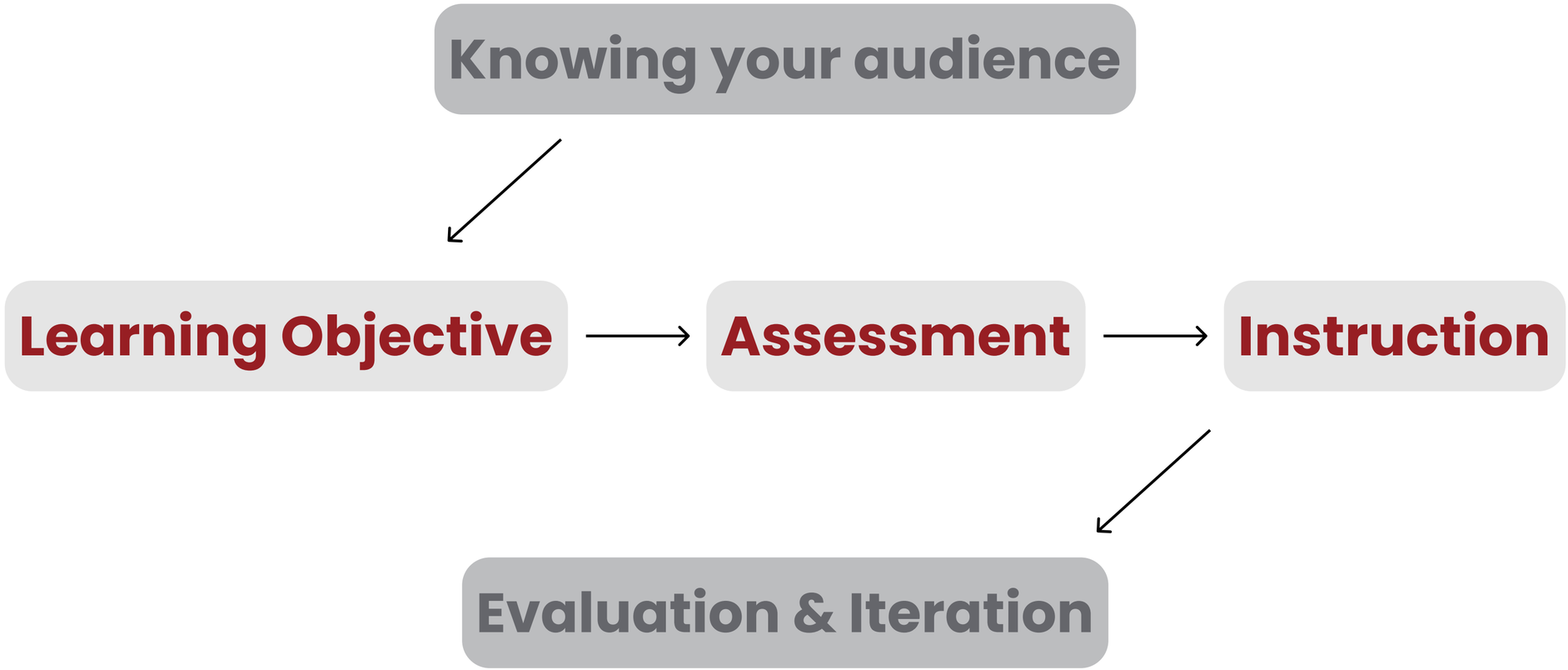
- **Alignment Matrix Prompting**

Example Alignment Matrix

Learning Objective	Assessments	Instructional Strategies
Students will be able to implement a basic program that outputs the statement "Hello, World!" in a chosen programming language.	1. Code submission of "Hello, World!" program. 2. Quiz on basic syntax and structure.	1. Lecture on programming basics and syntax. 2. Hands-on coding lab with guided practice. 3. Peer review of code to reinforce learning.

Carnegie Mellon University

Potentials of GPT in Educational fields



Carnegie Mellon University

Thank you for listening

Carnegie Mellon University

generate/rephrase learning objective

Examine objective fitting student's need

Generate assessment

Generate hint and personalized feedback

Instant learning analytics

Generate instruction

Customize instruction to student’s preference

generate aid content (multi modal)