Designing a Blueprint

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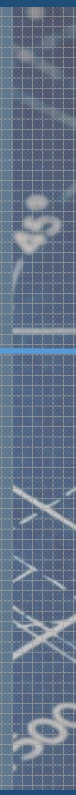


Objectives

- By the end of this workshop, the learner should be able to:
  - Understand the purpose of creating a blueprint
  - Understand basic educational taxonomy
  - Identify the targeted content standards and the number of items or tasks used to measure student knowledge and skills
  - Create an assessment blueprint

Outline

- Definition and purpose of a Blueprint
- Taxonomy of education knowledge
- Steps in creating an assessment blueprint
- Practice

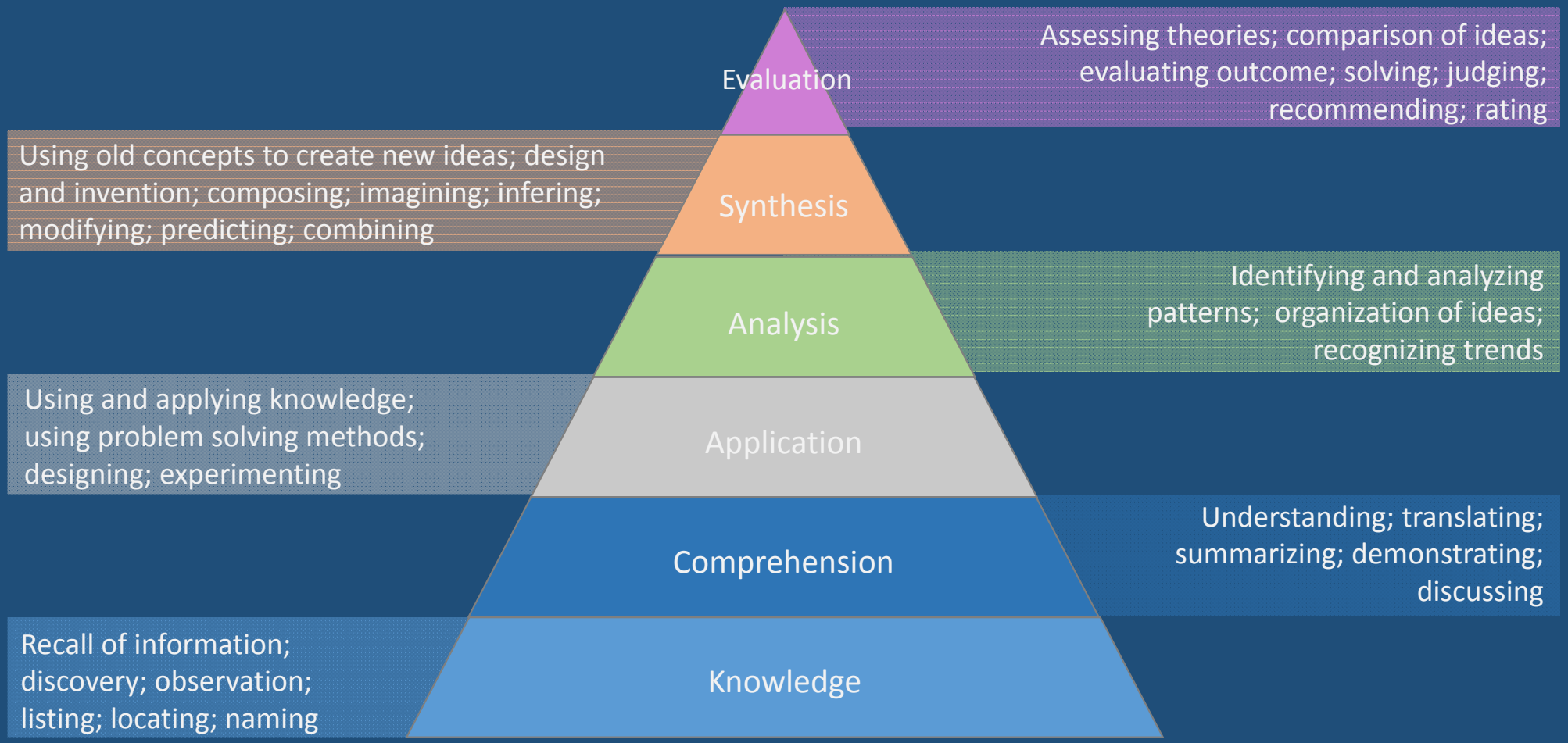
What is a Blueprint?

- Matrix or chart reporting the number and type of questions represented across the topics in content area, consistent with learning objectives and relative weight on test given each topic
- Identifies the percentual weight of cognitive dimensions as the level of competence tested in each knowledge domain

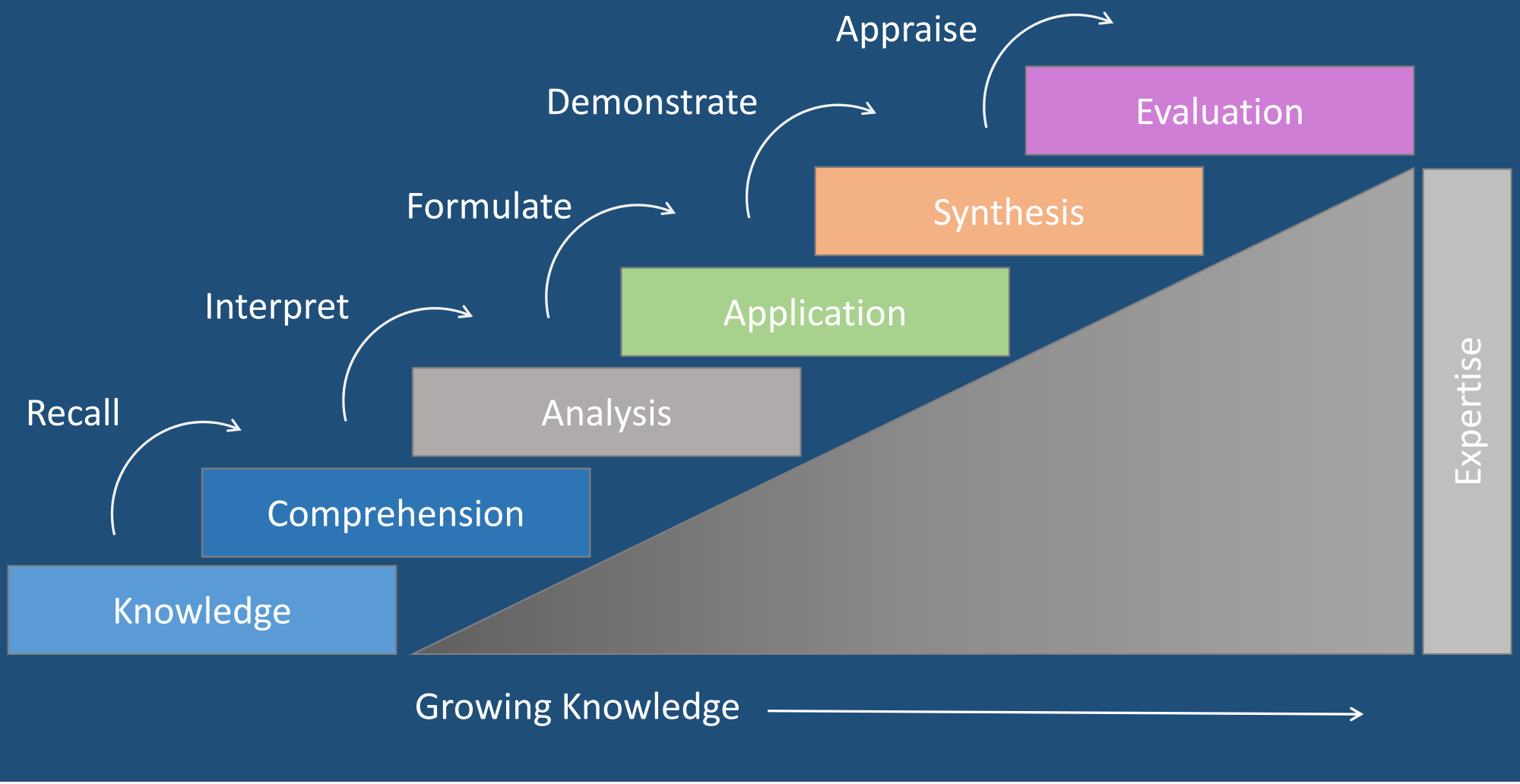
What is the Purpose of Blueprints?

- To provide a conceptual map of examination format and the content area represented in assessment.
- A blueprint provides information about:
  - Type of measurement tools and proportion of each question format in assessment shown in respective weighting columns.
  - Topics and the level of training for each topic and the relevant learning objectives

Bloom's Taxonomy of Educational Objectives



Acquisition of Knowledge



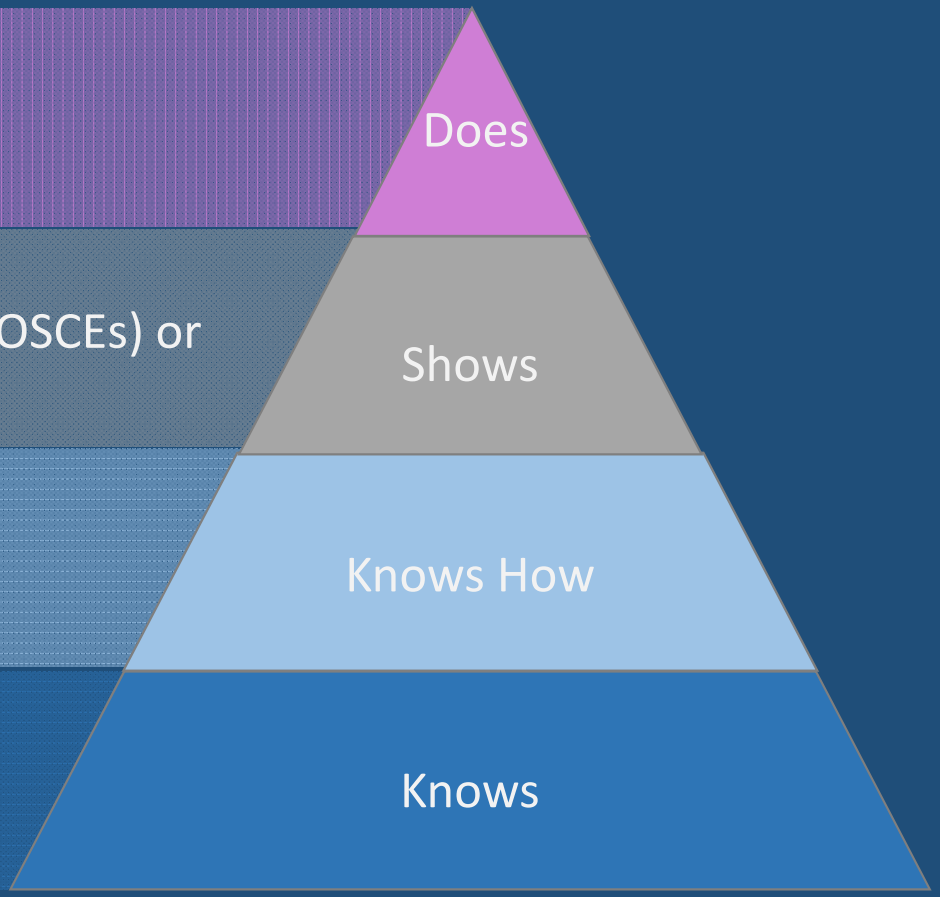
Miller's Pyramid of Competence

Performance Integrated into Practice
Workplace-based assessment

Demonstration of Learning
Objective structured clinical examinations (OSCEs) or simulation

Interpretation and Application
Written essays and case presentations

Fact Gathering
Multiple-choice questions or short answer questions



Who Will Use the Blueprint?

- Teaching faculty to ensure the validity of assessment in terms of questions being representative of content area documented in curriculum
- Candidates may use examination blueprints to ensure preparation for assessment, time management and strategy to achieve the desired outcome of passing the examination

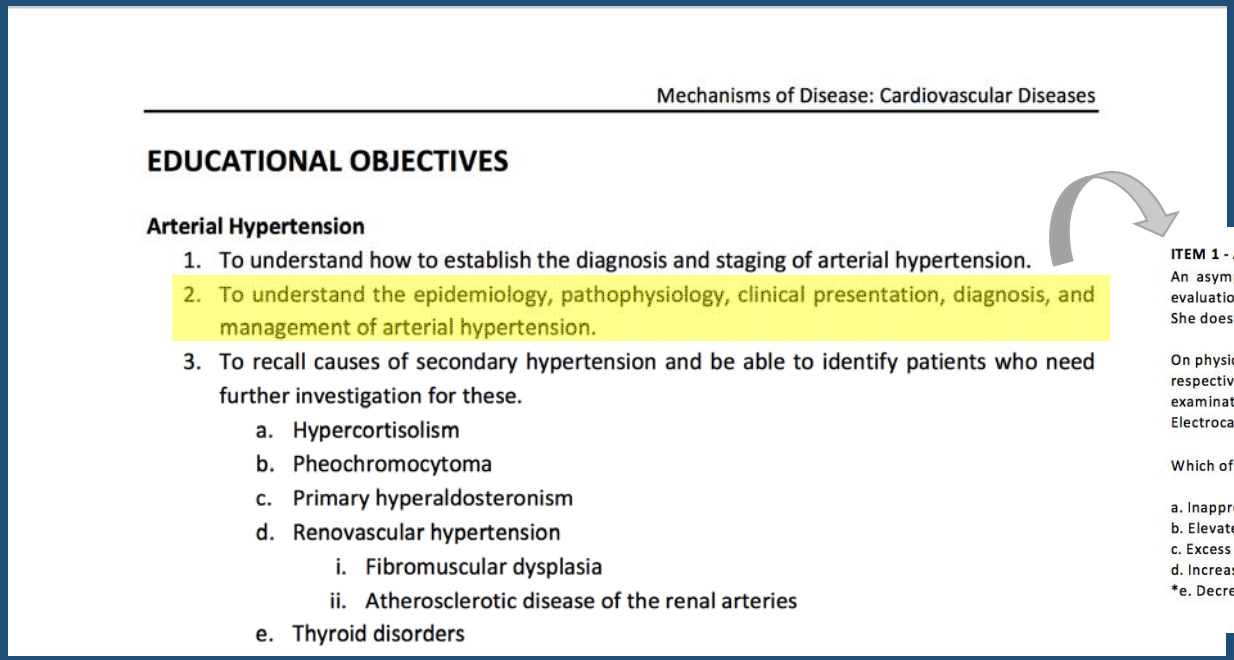
Who Will Use the Blueprint?

EXAM DISTRIBUTION

The final examination for this Block is scheduled on **November 9, 2015**. There will be about forty (40) questions for the Mechanism of Disease portion of the exam. The following table details the approximate distribution of questions for each area. Please keep in mind that you will be taking an Electrocardiography Quiz, for which this component is not part of the exam. However, some exam questions may be based on an electrocardiogram.

Topic	Percent (%)
Arterial hypertension	5
Cardiac arrhythmias & Electrophysiology	17.5
Cardiovascular physiology	5
Congenital heart disease	10
Diseases of the peripheral vessels	5
Heart failure & Cardiomyopathies	17.5
Ischemic heart disease	20
Pericardial diseases	5
Shock workshop	5
Valvular heart disease	10

Preparing a Blueprint



Mechanisms of Disease: Cardiovascular Diseases

EDUCATIONAL OBJECTIVES

Arterial Hypertension

1. To understand how to establish the diagnosis and staging of arterial hypertension.
2. To understand the epidemiology, pathophysiology, clinical presentation, diagnosis, and management of arterial hypertension.
3. To recall causes of secondary hypertension and be able to identify patients who need further investigation for these.
    a. Hypercortisolism
    b. Pheochromocytoma
    c. Primary hyperaldosteronism
    d. Renovascular hypertension
        i. Fibromuscular dysplasia
        ii. Atherosclerotic disease of the renal arteries
    e. Thyroid disorders

ITEM 1 - ARTERIAL HYPERTENSION

An asymptomatic 70-year-old woman with a past medical history of hypercholesterolemia comes to your office for evaluation of high blood pressure. On her previous 2 visits, her blood pressure has been 154/68 mmHg and 150/52 mmHg. She does not smoke or use alcohol. She walks 30 minutes daily and has followed a low-salt diet over the last two months.

On physical exam, heart rate is 68 bpm and blood pressure is 157/63 mmHg and 161/60 mmHg on the right and left arms, respectively. She is 168 cm (5 ft 6 in) tall and weighs 76 kg (168 lb); body mass index (MI) is 27.1 kg/m^2. The heart and lung examinations are unremarkable. No vascular bruits are heard, and peripheral pulses are 2+ and symmetrical. Electrocardiogram shows normal sinus rhythm. Complete blood count and chemistry panel are normal.

Which of the following is the most likely cause of hypertension in this patient?

a. Inappropriate secretion of aldosterone
b. Elevated plasma renin activity
c. Excess circulating mineralocorticoids
d. Increased intravascular volume
*e. Decreased compliance of the arterial wall

- Before creating a blueprint, you must develop educational objectives for the course!

Preparing a Blueprint

- The first step is to determine:
  - What are you trying to measure? (ie, course content knowledge, analysis, skills, etc.)
  - What is the best way to deliver the assessment?

Preparing a Blueprint

Type of Instrument	Number of Items	Relative Weight/Item	% Weight
Multiple choice questions	30	2 pts	60
True/False questions	20	1 pts	20
Short essay questions	2	10 pts	20
TOTAL:	52	---	100

Preparing a Blueprint

- Decide what you are trying to measure based on course educational objectives
- Decide the amount of items in a test and the percentage weight assigned to each component and to each domain

Preparing a Blueprint

Content Area	Knowledge	Compre-hension	Analysis	Application	Total Items	Weight (%)
Arterial hypertension	1	1	1	0	3	7.5
Cardiac arrhythmias	2	3	1	1	7	17.5
Cardiovascular physiology	1	0	1	1	3	7.5
Congenital heart disease	1	2	1	0	4	10.0
Heart failure	1	2	1	0	4	10.0
Ischemic heart disease	2	3	1	1	7	17.5
Pericardial diseases	1	1	1	0	3	7.5
Peripherovascular disease	1	2	1	0	4	10.0
Valvular heart disease	0	2	1	2	5	12.5
TOTAL:	**10**	**16**	**9**	**5**	**40**	**100.0**
%Weight	**25.0**	**40.0**	**22.5**	**12.5**	**100.0**	

Preparing a Blueprint

Item	Type	Content	Domain	Objective/Outcome
1	MCQ	Arterial hypertension	Knowledge	To identify the clinical presentation of and recall the pathophysiology of isolated systolic arterial hypertension in the elderly patient.
2	MCQ	Arterial hypertension	Comprehension	To determine the most appropriate evaluation strategy for a patient with suspected secondary arterial hypertension.
3	MCQ	Arterial hypertension	Analysis	To identify the clinical presentation of primary aldesteronism as a cause of secondary hypertension based on history and laboratory results.
4	MCQ	Cardiac arrhythmias	Knowledge	To identify the electrocardiographic appearance of atrial flutter and recall its pathophysiology.
5	MCQ	Cardiac arrhythmias	Knowledge	To recall that ischemic heart disease is the most common cause of sudden cardiac death.

Questions?

Practice Exercise

- Retro-design an assessment blueprint for an exam, based on educational objectives