Putting It All Together to Build an Exam

There are multiple formats you can use to check for learning, but putting those formats together to build an effective and efficient exam is a crucial component of the teaching and learning process. Exams are a common approach to measure student learning after instruction and provide a basis for assigning course goals. Most often, results provide students feedback on what they learned and provide you information on the instructional effectiveness of a unit or course.

STEP 1: PURPOSE AND SCOPE

Examine your course learning outcomes to determine the exam's purpose and scope. Consider what is most essential for students to know and be able to do with the course content covered to this point.

The purpose of a first exam for your students could be to measure their learning over units 1 and 2, provide feedback to them about what they do and don't understand yet, and counts towards 20 percent of their overall grade. For you, the purpose could be to determine the effectiveness of instruction for units 1 and 2 to guide future changes of the course.

STEP 2: CREATE AN EXAM BLUEPRINT

An exam blueprint consists of a chart representing the number of questions you want in your exam within each unit/topic and for each learning outcome. The blueprint helps ensure your exam covers the desired topics, skills, and at the appropriate cognitive level. Some items to consider when developing a blueprint include:

- Match questions to intended outcomes at the proper difficulty level.
- Ensure each question deals with an important aspect of the content and not with trivia.

The simplified example below breaks the exam down by topic and Bloom's Taxonomy, but you could expand upon this idea by using learning outcomes rather than topics.

40-question exam

	Topic A	Topic B	Topic C	Topic D	TOTAL
Knowledge	1	2	1	1	5 (12.5%)
Comprehension	2	1	2	2	7 (17.5%)
Application	4	4	3	4	15 (37.5%)
Analysis	3	2	3	2	10 (25%)
Synthesis		1		1	2 (5%)
Evaluation			1		1 (2.5%)
TOTAL	10 (25%)	10 (25%)	10 (25%)	10 (25%)	40

After creating your blueprint, figure out the types of questions that will meet your needs and the points assigned for each question.

STEP 3: SELECT THE FORM OF EXAM QUESTIONS

Choosing between open-ended and fixed-choice questions will depend on your learning outcomes, the strengths/limitations of each type, and the context of the course (e.g., class size, availability of graders/TAs, time).

Fixed Response

Fixed-choice questions offer answer choices that require students to select the correct response from several alternatives or to provide the single correct response; this includes multiple-choice, true/false, matching questions, and short answer or fill-in-the-blanks.

What are the strengths of fixed-response formats?

- Ability to measure simple and complex learning outcomes
- Assess mastery of a variety of concepts within a single exam
- Scoring is easy and reliable
- Can cover a lot of material very efficiently

What are the limitations of fixed-response formats?

- Writing good questions is time consuming
- Difficult to measure higher-order thinking skills

Created-Response

Open-ended questions require students to write and present an original answer; they include various forms of essays, short answers, projects, and performance tasks.

What are the strengths of created-response formats?

- Are easier to create than other question types
- Can effectively measure higher order cognitive learning

What are the limitations of created-response formats?

- Time consuming to score
- Difficult to measure a large amount of content or course learning objectives

STEP 4: WRITE EXAM QUESTIONS

A general guideline for writing any type of exam questions is to make sure each question is based on a learning outcome of the course, not trivial information. Be sure you

- Provide instructions that are unambiguous and explicit.
- Avoid trick questions. (Questions that require students to interpret your intentions).

After you finish writing your exam questions:

- Ensure the question or problem posed is clear and unambiguous.
- Verify each question is independent of all other questions (i.e., a hint to an answer should not be unintentionally embedded in another question).
- Check fixed-choice questions have one correct or best answer on which experts would agree.
- Prevent unintentionally giving clues to the answer within the statement or question (e.g., grammatical inconsistencies such as 'a' or 'an' give clues).
- Avoid language and examples that are in the textbook or were covered in class.

STEP 5: ORGANIZE THE EXAM

On an exam with multiple question formats group all questions of similar format together. Questions should follow an easy to difficult progression. Space the questions to eliminate overcrowding. Have diagrams and tables above the question using the information, not below.