



# The Fundamentals of Multiple Choice Question Writing for Better Learning

BSPH Center for Teaching and Learning

**THIS SESSION WILL BE RECORDED**



# Workshop Goals



Discuss the **advantages** and **disadvantages** of using multiple choice questions



Recognize key strategies to address **academic ethics** in multiple choice assessments

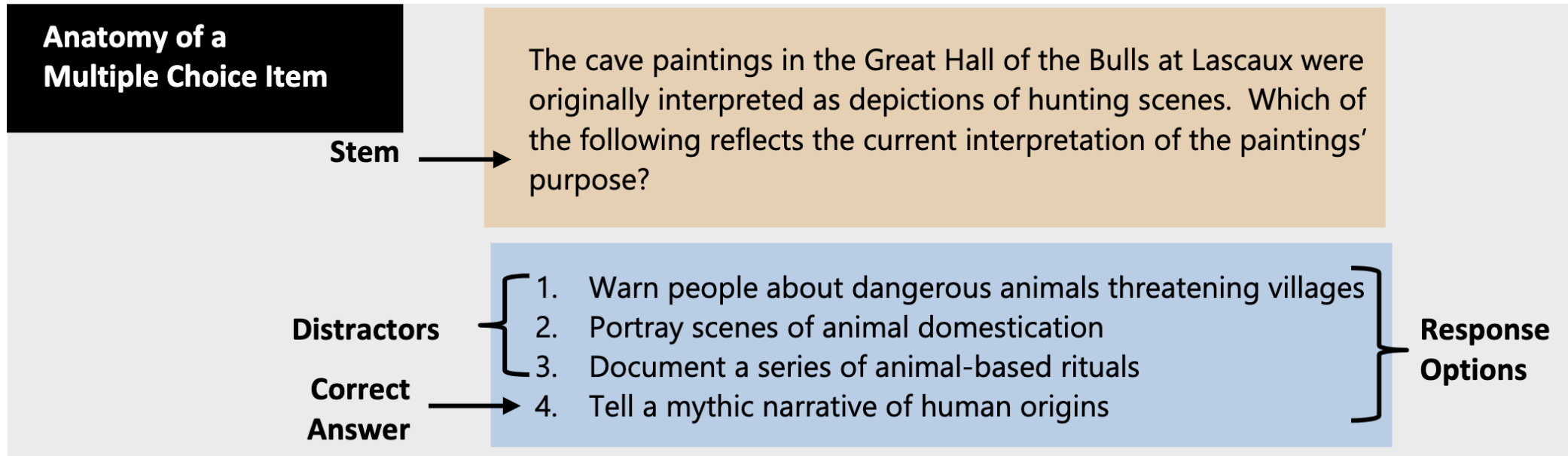


**Critique** multiple choice questions for common flaws



Examine multiple choice questions that target **higher levels of learning**

# Multiple Choice Question (MCQ)



# Advantages of Using MCQs for Learning

Efficient and effective method of formative assessment

Facilitates timely feedback

Useful for monitoring student learning and identifying gaps in understanding

Provides excellent data for post-test discussion

Provides a scalable option for both formative and summative assessment

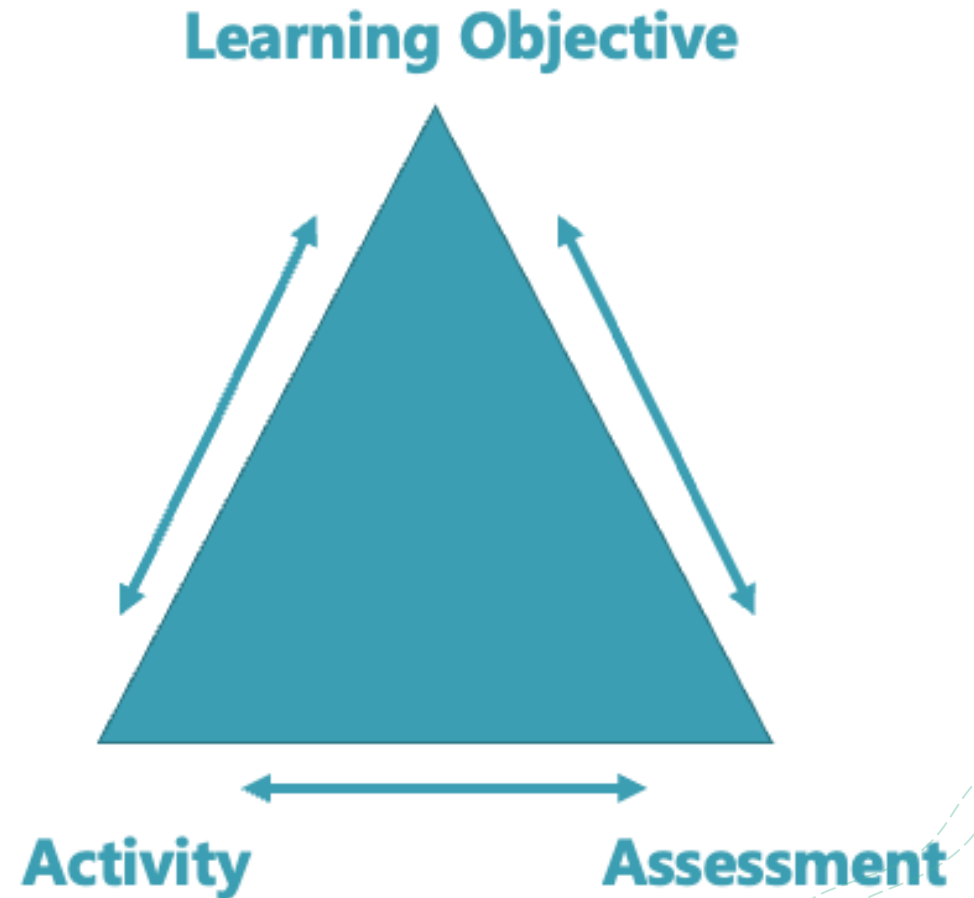
# Disadvantages of Using MCQs for Learning

- ⚠️ Poorly written distractors can confuse students
- ⚠️ Flawed construction may result in unintended difficulty
- ⚠️ May encourage guessing
- ⚠️ Often targets lower levels of learning
- ⚠️ Poses challenges for academic integrity

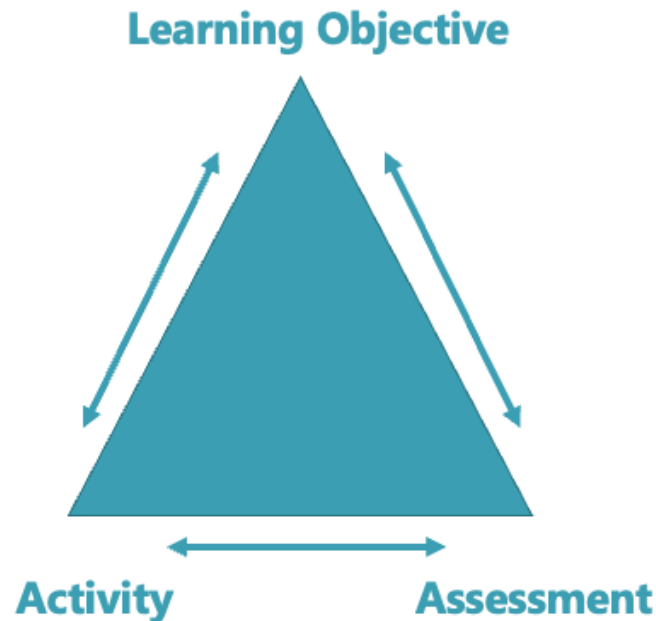


# What Are Your Experiences?

# The First Step to Writing an MCQ That Supports Learning is Alignment



# Example of an MCQ Question That Supports Learning



## Objective:

Recall the biological life cycle of a biennial plant

## Activity:

Lecture: Biological Life Cycle of a Biennial Plant

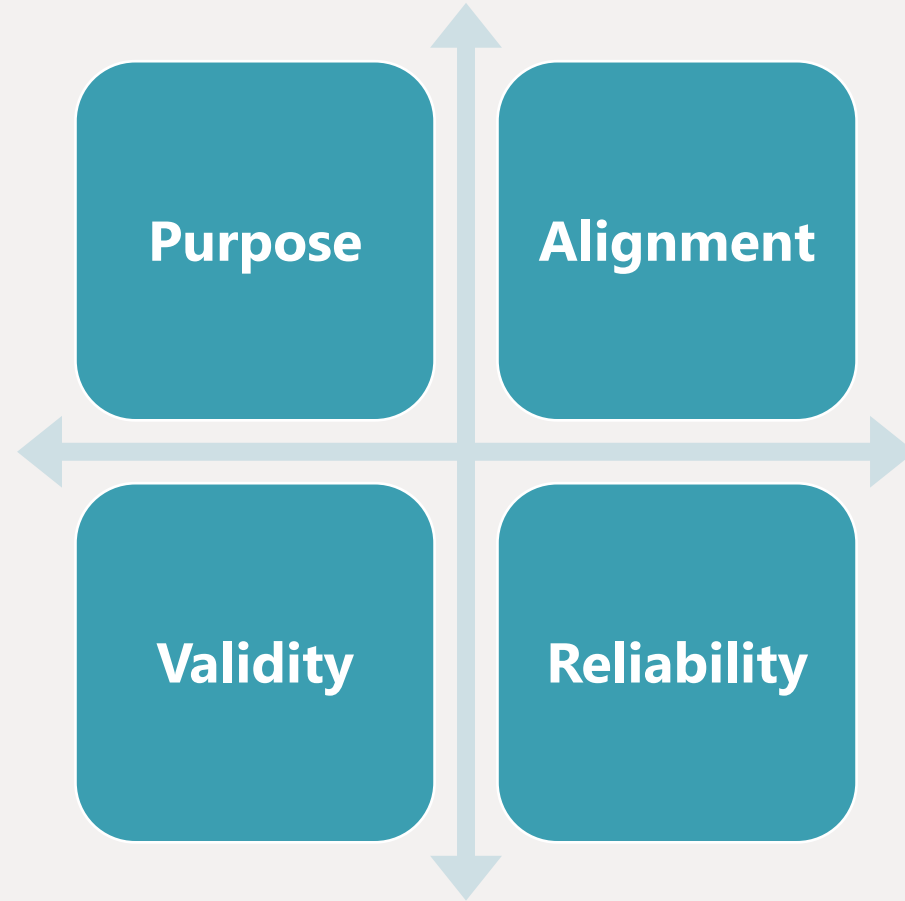
## Multiple Choice Item:

How long does a biennial plant generally live?

- A. One year
- B. Two years
- C. Three years



# Planning Purposeful, Valid, and Reliable MCQ Items



(BURTON, SUDWEEKS, & MERRILL, N.D.).

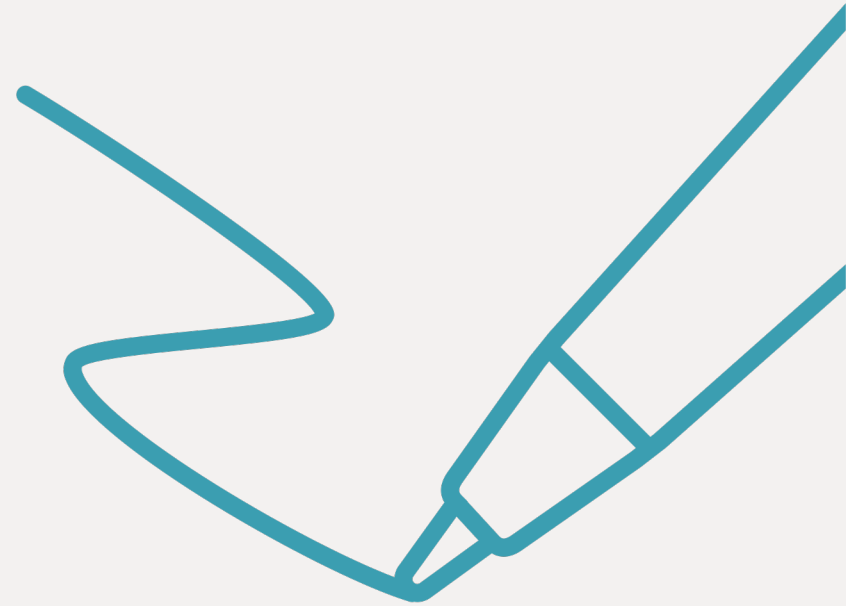


# Constructing the MCQ

Stem and Response Options

# Designing the Stem

- + Write a meaningful stem
- + Express the stem as a direct question
- + Write concisely and clearly
- + Word the question positively



# Negative wording in the stem

Stem example (1):

In some situations, exercise can lead to skeletal muscle injury. Which one of the following statements is **NOT CORRECT**?

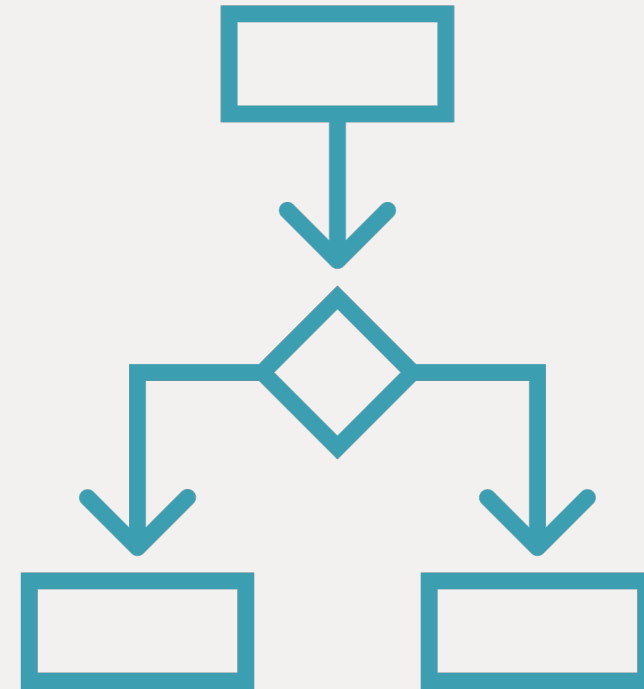
Stem example (2) :

Tinted lenses for outdoor use are **LEAST** likely to benefit a person with which of the following ocular conditions?

*Research study: Chiavaroli (2017): Negatively-Worded Multiple Choice Questions: An Avoidable Threat*

# Designing the Response Options

- + Use 3-4 response options
- + Have only one correct answer
- + Distractors should be equal in plausibility
- + Use the “none of the above” or “all of the above” sparingly



# What could be improved in this MCQ item?

Which of the following is a true statement?

- A. Mitochondrial genomes are relatively constant in content i.e., types of genes)
- B. Mitochondrial genomes are relatively constant in organization
- C. Mitochondrial genomes are relatively constant in size

# Needs revision

**Stem isn't meaningful, and response options are wordy and redundant**

Which of the following is a true statement?

- A. Mitochondrial genomes are relatively constant in content i.e., types of genes)
- B. Mitochondrial genomes are relatively constant in organization
- C. Mitochondrial genomes are relatively constant in size

# Revised

**Stem isn't meaningful, and response options are wordy and redundant**

Which of the following is a true statement?

- A. Mitochondrial genomes are relatively constant in content i.e., types of genes)
- B. Mitochondrial genomes are relatively constant in organization
- C. Mitochondrial genomes are relatively constant in size

**Meaningful stem and concise, clear response options**

What characteristic is relatively constant in mitochondrial genomes across species?

- A. Content (i.e., types of genes)
- B. Organization
- C. Size



# Best Practices for MCQs That Support Learning

- + Avoid trick questions
- + Provide clear instructions and parameters
- + Use familiar, unbiased, culturally sensitive language



# Supporting All Learners

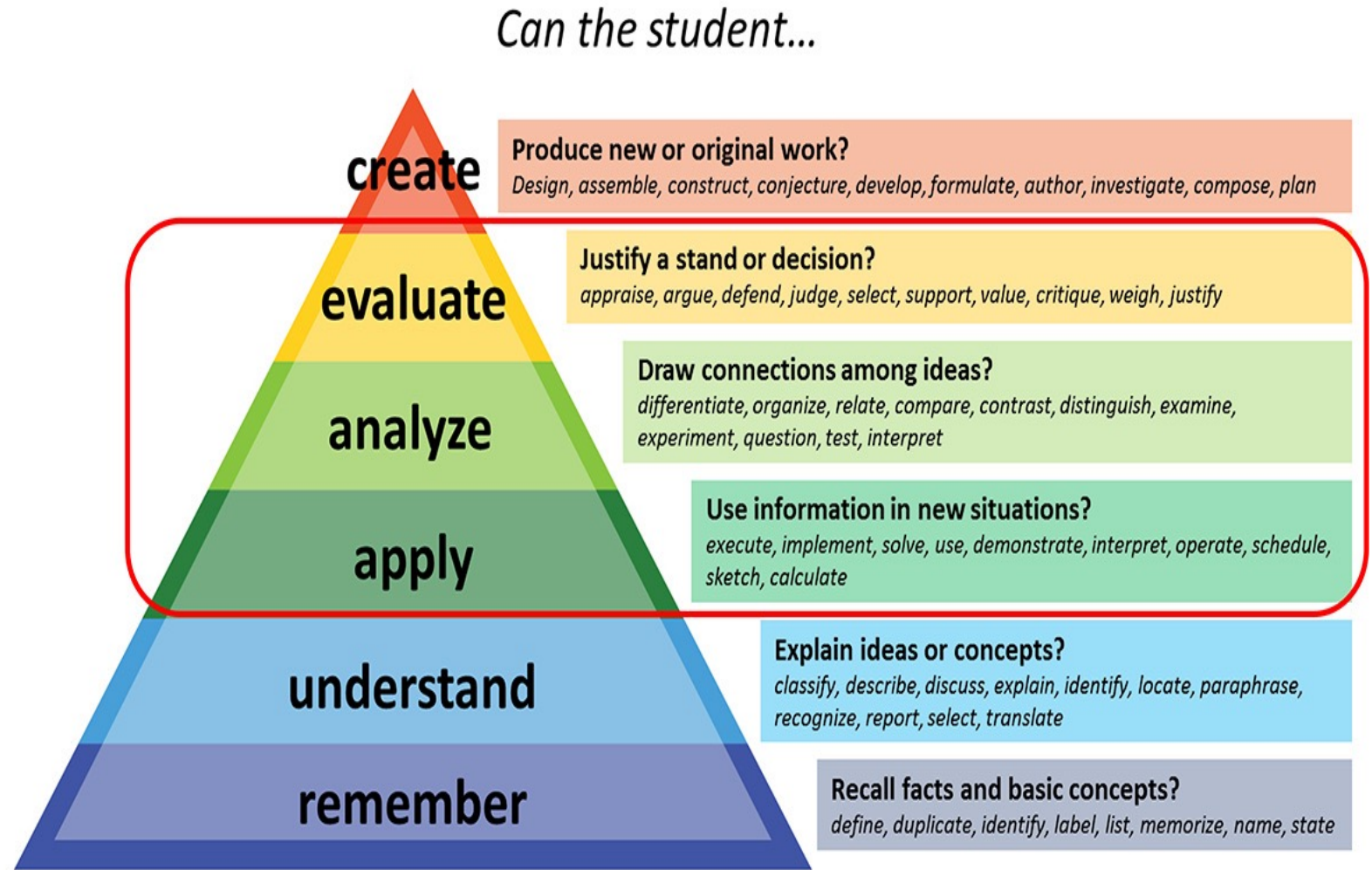
- + Offer overview sessions
- + Explain the format of the exam
- + Provide study guides and resources





# Writing MCQs That Demand Higher Order Thinking

# Application of Bloom's Taxonomy for Assessment



# Scenarios

Present practical or real-world scenarios (e.g., journal articles) that require interpretation, case studies that require analysis.

While watching TV, you see a public service announcement that claims the following:

“Last year, 250000 individuals died in car accidents when they were not wearing their seatbelts. This shows how dangerous it is to drive without your seatbelt fastened. Be safe. Buckle up.”

If you say “yes” in response to the previous question, you committed which of the following violations in rationality?

- A. Ignoring baseline rates
- B. Framing effect
- C. Small sample bias
- D. Conjunction fallacy

# Visuals

Make use of visuals that require a learner to analyze, evaluate or describe the application of 'x' .

Look at the following table and indicate which countries' statistics are being reported in rows A, B and C.

	GNP per capita 1991 ( \$ USA)	Growth rate of GNP per capita p.a. 1980-91	Population growth rate 1980-91	Structures of total employment 1980-85 (percentages)		
				Agriculture	Industry	Services
<b>A</b>	500	2.5%	1.5%	51	20	29
<b>B</b>	1570	5.8%	1.6%	74	8	8
<b>S.A.</b>	2560	0.7%	2.5%	17	36	36
<b>C</b>	25110	1.7%	0.3%	6	32	32

Choose your answer from the following list of possible answers:

1. A is South Korea; B is Kenya; C is Canada
2. A is Sri Lanka; B is Germany; C is Thailand
3. A is Sri Lanka; B is Canada; C is Sweden
4. A is Namibia; B is Portugal; C is Botswana

# Answer + Why

Use possible response options including the answer and then a variety of reasons that support the answer.

You arrive at the scene of an accident where people are panicked and yelling. Several people appear to be injured. One person comes to you scrapes and a possible broken wrist, a second is lying on the ground moaning in pain and a third is losing blood from an abdominal injury. Which person will you take care of first?

- A. The person with scrapes and a wrist injury because this problem is most easily addressed.
- B. The person groaning in pain because the patient is in the greatest distress.
- C. The person groaning in pain because the patient is distressing others.
- D. The person with the abdominal injury because this injury is most life-threatening.
- E. The person with the abdominal injury because this injury may endanger others.

# Example 1: Convert the lower level MCQ

**Before:** The attack rate in susceptible people who have been exposed to a primary case is referred to as\_\_\_\_\_.



# Revised to be a Scenario

**Before:** The attack rate in susceptible people who have been exposed to a primary case is referred to as\_\_\_\_\_.

**After:** In a particular community, 115 persons in a population of 4,399 became ill with a disease of unknown etiology. The 115 cases occurred in 77 households. The total number of persons living in these 77 households was 424. **Calculate** the overall attack rate in the community and the secondary attack rate in the affected households, assuming that only one case per household was a primary (community-acquired) case.

# Example 2: Convert the Lower Order MCQ

**Before:** Name three qualities of effective entrepreneurs.

# Revised to Answer + Why

**Before:** Name three qualities of effective entrepreneurs.

**After:** Review the financials of these three startup companies.  
Which one would you invest in and why?

# Promoting Academic Integrity - 1

- + Reduce the impact of high stakes exams
- + Use formative assessment practices
- + Have an honor statement
- + Consider where open book may be appropriate



# Promoting Academic Integrity - 2

- + Use question groups or multiple versions of exams
- + Time limit
- + Randomize
- + Consistent answer length
- + Create a supportive learning environment



# Key Takeaways



- Excessive use of “none of the above” and complex sentences
- Excessive use of negative phrasing
- Use culturally biased or unfamiliar terminology
- Use unplausible distractors



- ✓ Craft clear, aligned questions that are meaningful
- ✓ Use strategies to support all learners
- ✓ Write questions at varied cognitive levels – driven by the learning objectives
- ✓ Employ strategies to promote academic integrity



# Q & A

# Upcoming MCQ Workshops

- + Part 2: CoursePlus Quiz Generator
- + Part 3: Writing Multiple Choice Questions for Higher Level Thinking  
– *a hands-on working session*

Dates and registration links will be posted on [the Events page](#) of the Teaching Toolkit website, **SPHeed Read** and [BSPH Events Calendar](#).







CTL Instructional  
Design Team  
(ctlhelp@jhu.edu)



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Teams Channel: Ask  
an Instructional  
Designer

# Consultations and Help

# We Value Your Feedback!

Take the Session  
Evaluation Survey



# Thank You For Joining Us Today!

**Lu Chi**, Instructional Designer, MS | BSPH CTL

+ [lyang.ctl@jhu.edu](mailto:lyang.ctl@jhu.edu)

**Jennifer Applegate**, PhD | Assistant Scientist,  
International Health, C2S Course Facilitator

+ [japplegate@jhu.edu](mailto:japplegate@jhu.edu)

**Marykate Bergen**, MPH | DrPH Student, C2S Course  
Facilitator

+ [mbergen2@jhmi.edu](mailto:mbergen2@jhmi.edu)

**Mia Lamm**, MSIS, MLIS | Sr. Instructional Designer,  
BSPH CTL, Associate, Health, Policy, and Management

+ [mlamm2@jhu.edu](mailto:mlamm2@jhu.edu)



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