

# Chris's Poster

## Evolution of Clicker Questions in IPHY 3410: Human Anatomy

<b>Semester</b>		<b>Time Point</b>	<b>Method of Use</b>	<b>Percent Correct</b>
Fall '07	<b>Initial Use</b>	Early Semester	Used Text Book Clicker Questions	Majority
	<b>Observation</b>	Mid-Semester	Used a clicker question that exposed a misconception	50%
	<b>Change</b>	End of Semester	More challenging questions to reveal misconceptions or difficulties	Average 30-60%

Spring '09

**Initial Use**

Early Semester

More challenging questions to reveal misconceptions or difficulties

Average 30-60%

**Observation**

Early Semester

Too many students using notes to correctly answer questions

**Change**

All-Semester

Additional Questions that required more thought than just flipping through notes

Average 10-50%

# Example of Initial Clicker Questions Fall '07

What process forms the majority of bone in our bodies?

- A. Endochondral ossification
- B. Extramembranous ossification
- C. Intramembranous ossification
- D. Skeletal Calcification
- E. None of the Above

# Example of Misconception Clicker Question

## The AHAA moment!

Which of the following is the correct sequence of the contraction of the heart chambers?

- A. Random
- B. Left chambers followed by right chambers
- C. Both atria followed by both ventricles
- D. Both ventricles followed by both atria
- E. Right atrium, right ventricle, left atrium, left ventricle

# Ex. of Fall '07 End of Semester Questions and Sp '09 Questions

Following an action potential,  
neurotransmitter is released into what  
space?

- A. Presynaptic terminal
- B. Postsynaptic density
- C. Synaptic cleft
- D. Synaptic Vesicle
- E. None of the Above

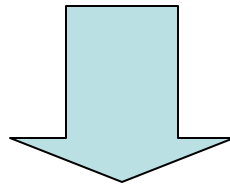
# Ex. of More Challenging Questions: Sp '09

You have just worked out at the gym and accumulated lots of metabolic wastes in your blood. Physiologically, these wastes need to first be processed by your liver to detoxify them before they can be excreted into your urine via the kidney. In their shortest route through the blood circulation, how many times will the waste products go through your heart between the time they are picked up in your muscles (let's say your calf muscle), processed by the liver, and excreted through the kidney? (Choose shortest route that includes all necessary organs)

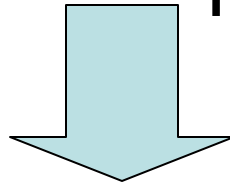
- a. calf → liver → heart → lung → heart → kidney
- b. calf → heart → liver → heart → kidney
- c. calf → heart → lung → heart → liver → kidney
- d. calf → heart → lung → heart → liver → heart → lung → heart → kidney
- e. calf → heart → lung → heart → liver → heart → lung → heart → liver → heart → kidney

# Stages of Clicker Use for Instructors

**Stage 1:** Asking simple, primarily factual questions as a starting point.



**Stage 2:** Asking more challenging conceptual questions, or questions where the answer is not obvious and critical points can be argued.



**Stage 3:** Lecture is structured around a set of challenging clicker question that largely embody the material students are to learn.

