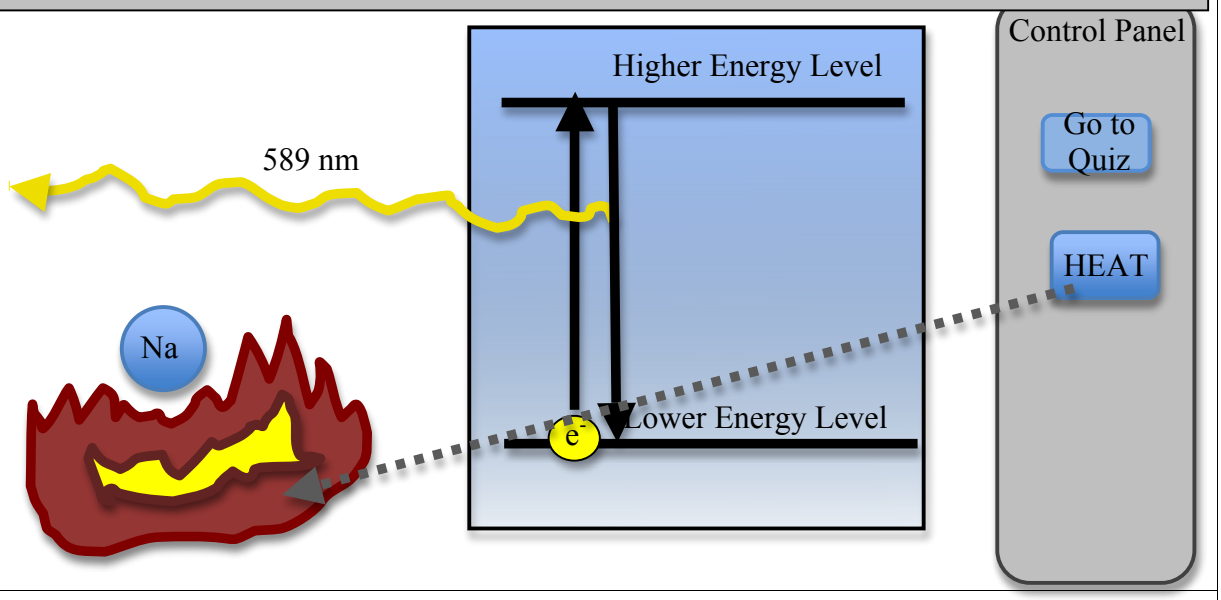
THM Content Design Document

Title: Atomic Emission Spec.
Course: Chem 204
Due date:
Instructions Text: Assemble the apparatus for AE, then use it to find a solution's concentration
Explore mode: Yes.
Special Considerations: Please make your own pictures.

Question # Explore mode

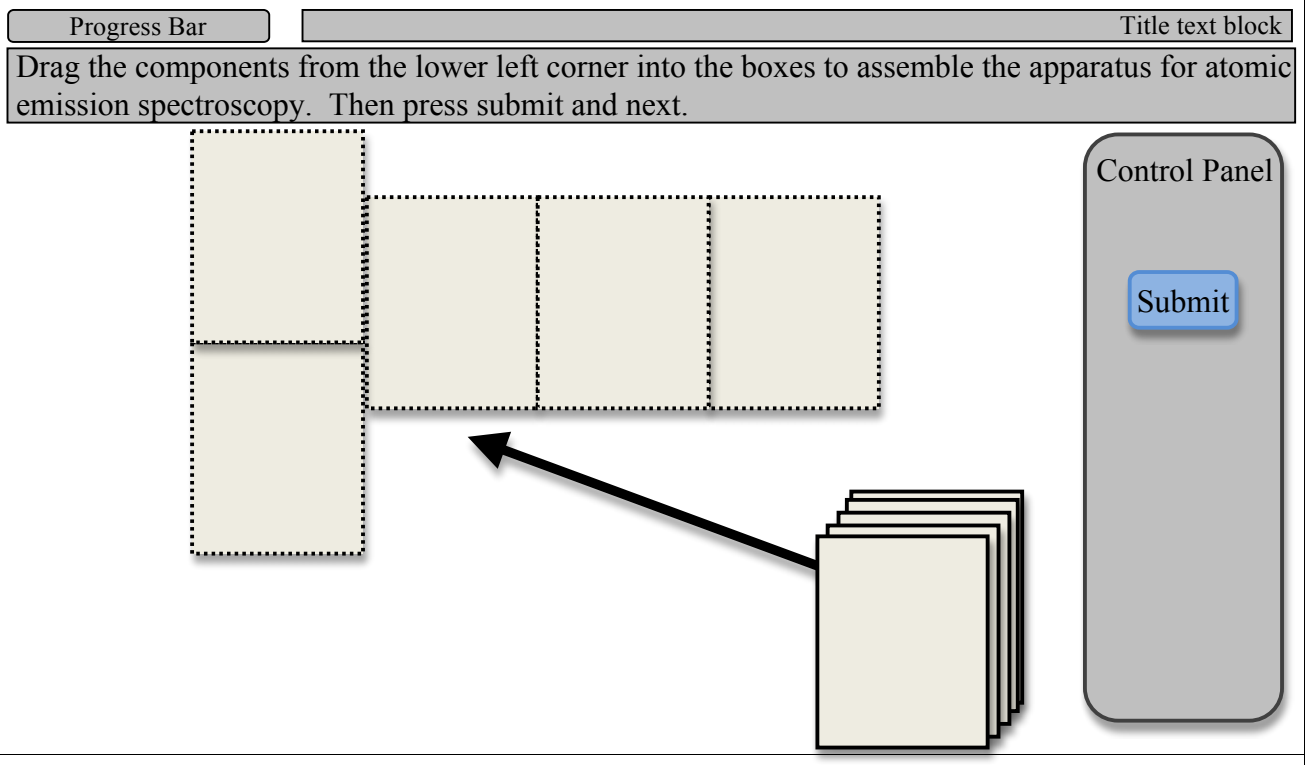
Progress Bar | Title text block

When an atom is heated, its electrons are excited to a higher energy level. When the electron returns to the ground state, it releases light of energy characteristic of the element. Press the heat button to excite the Na's electrons. Press "Go to Quiz" to move on.



Description: There is a blue ball labelled Na. There is a chart on the right with an e^- ball, a low line and a high line, as labelled. (the up and down arrows and the grey dotted arrow are just there for your understanding. They are not on the student's screen.)
When the student presses HEAT, for 4 seconds, a Fire appears under the Na. the e^- ball jumps up to the high line as soon as fire appears. When the fire disappears after 4 seconds, the e- drops back down to the lower line. When the e- drops, a bright yellow wavy arrow flies out of the e-. The wavy bright yellow arrow is labelled 589nm.

Question # 1 **out of**



Description: there is a stack of boxes in the corner. The stack has an image on each of the 5 boxes. The boxes have to be dragged into their correct empty slot.
The order in which the images are dragged off of the stack is shown in Appendix 1. Each box has its own tool tip label. The labels are shown in appendix 1.
The correct answer is shown in Appendix 2.

Correct answer Animation: Arrows and lines grow out from the left to the right, making the image look like appendix 2.

Incorrect answer Animation: The items all automove to their correct locations. Then correct answer plays.

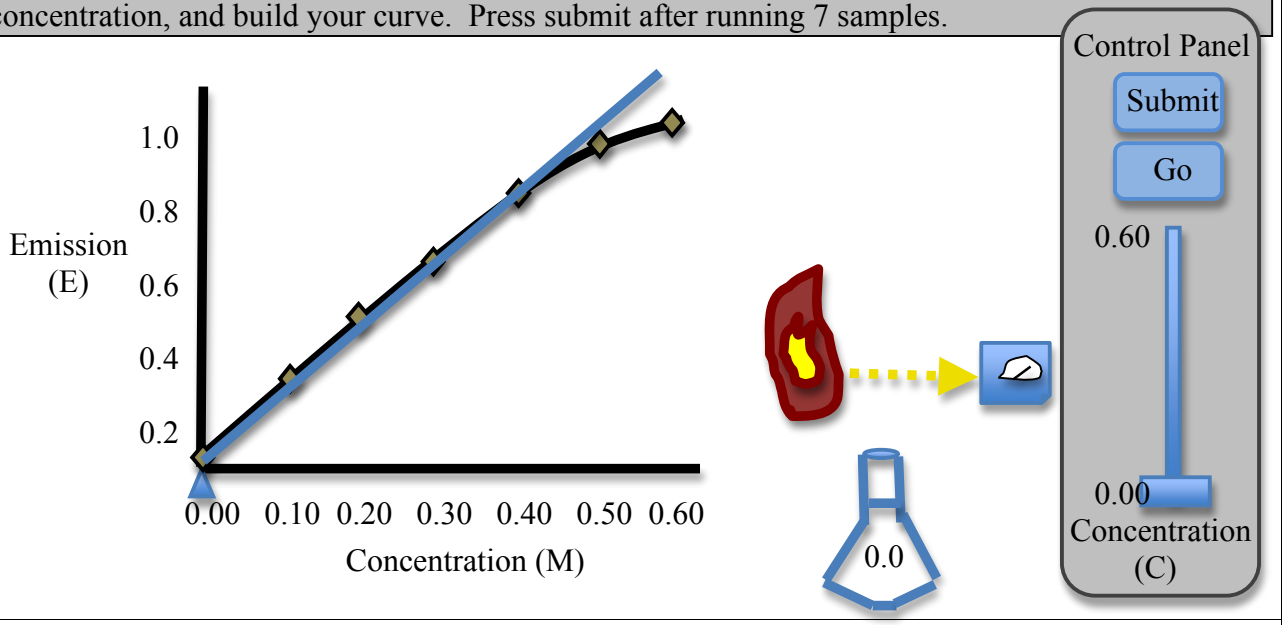
Incorrect submission hints: correct answers glow green, incorrect answers glow red. Glow lasts 2 seconds. Then, all boxes return to the stack.

"Show Answer" animation: The items all automove to their correct locations. Then correct answer plays.

Question # 2 **out of** 3

Progress Bar | Title text block

Knowing an element's characteristic wavelength of emission, we can draw its atomic emission curve. Change the concentration with the slider, and press "Go" to find emission at that concentration, and build your curve. Press submit after running 7 samples.



Description: A graph is on the left. Initially, there are no points. The axes are labelled as shown. On the control panel is a slider. The slider controls the small triangle marker on the x axis. X axis ranges from 0.0 to 1.2. Slider has 7 set positions – it has discrete positions, it is noncontinuous. As the slider increases, the number on the vial gets larger. As the slider falls, the number does too. The number reflects the concentration level of the slider.
The arrow on the graph moves along as they drag the slider.
When the student presses go, an arrow shoots through the flame as shown. A dot appears above the x axis marker (one of the diamonds shown). The points are drawn without a line when the student is placing them there.
After the student has 7 points made, after having pressed go at all 6 positions, they will be correct upon pressing submit.

Correct answer Animation: The line is drawn through the points.

Incorrect answer Animation: The points fill in on their own, then a line is drawn through the points.

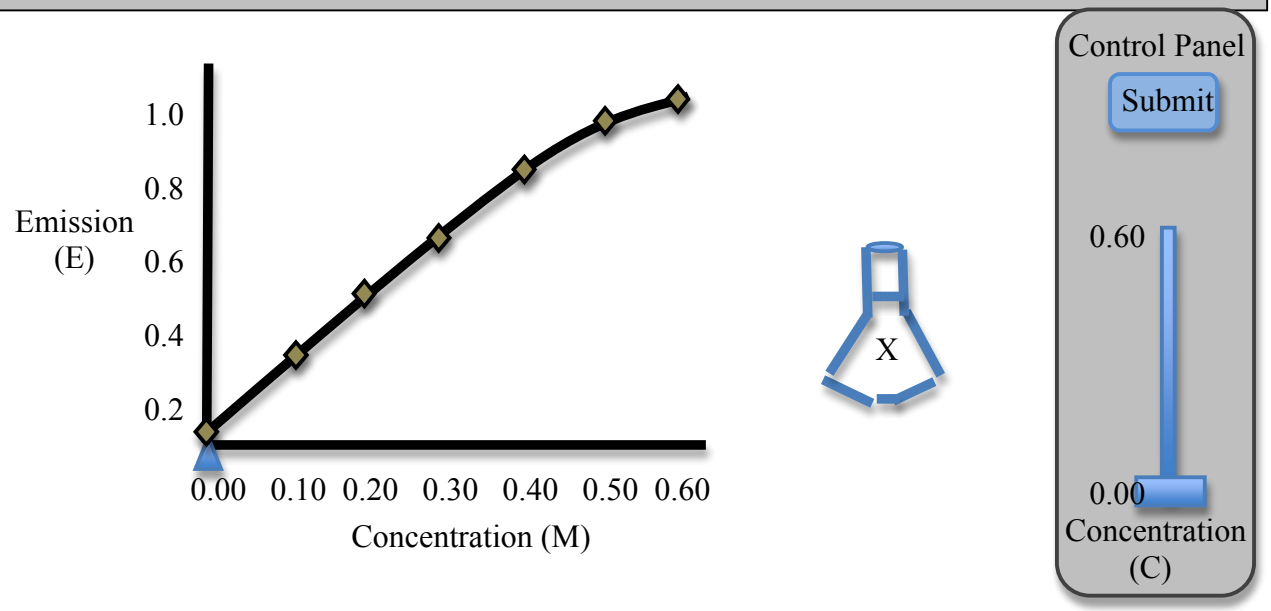
Incorrect submission hints: none

"Show Answer" animation: The points fill in on their own, then a line is drawn through the points.

Question # 2 **out of** 3

Progress Bar | Title text block

Use the graph to determine the concentration of a mystery solution, given that its emission = 0.6. Answer by setting the concentration with the slider, then press submit to finish.



Description: The same graph as in question 2 is made. A bottle is shown that reads X. the student must move the concentration slider (which drags along the marker on the graph). This time, the slider has 14 graduations (one for each 0.05, going from 0.0 to 1.2). If the student presses submit when the slider is at 0.5, then they are correct.

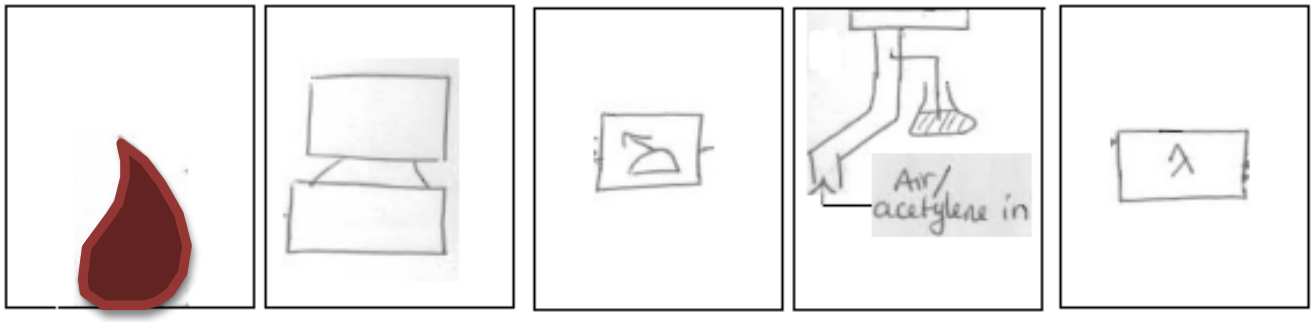
Correct answer Animation: the X fades away from the bottle, then replaces with the number 0.25.

Incorrect answer Animation: The slider auto sets to 0.25. the X fades away from the bottle, then replaces with the number 0.25.

Incorrect submission hints: none

"Show Answer" animation: The slider auto sets to 0.25. the X fades away from the bottle, then replaces with the number 0.25.

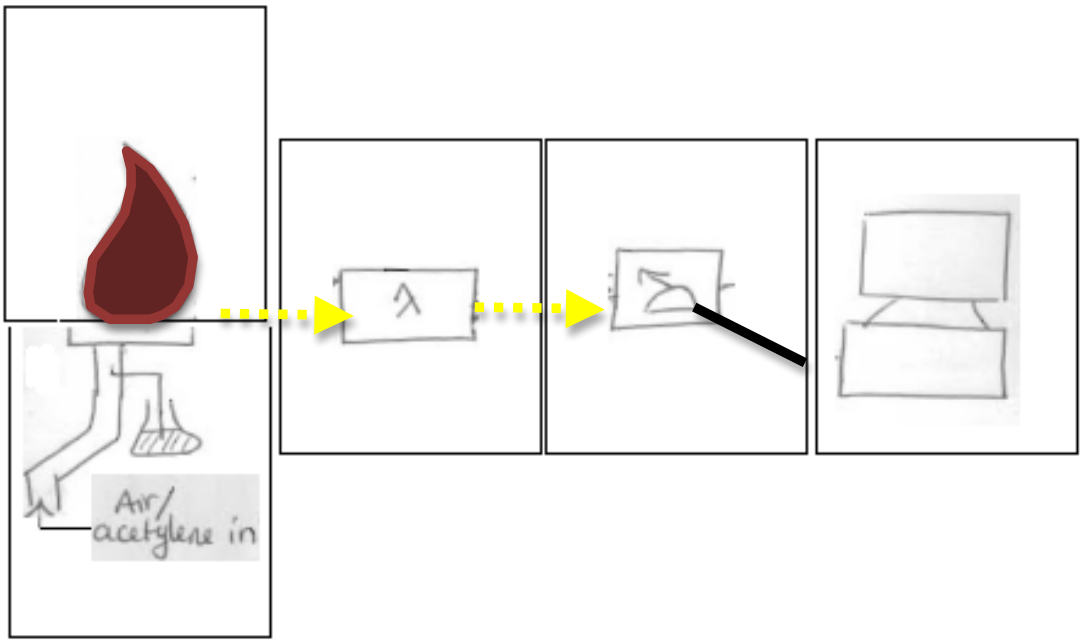
Appendix # 1



Description: The order of items that come out of the card stack in question 1.

Their tool tips read, from left to right:

1. Acetylene flame
2. Data processing (Computer)
3. Photodetector
4. Acetylene burner & sample
5. Monochromator

Appendix # 2

Description: The correct answer locations of the items in question1. The animation that follows is shown as well.

Quality Checklist:

OS and Browser Compatibility:

OS System	Firefox	Chrome	Safari
Windows			
Mac OSX			
Linux (Ubuntu)			N/A

NOTE: All demos must display each question properly for each OS/Browser combination.

Server Compatibility:

Description:	**Checklist**
SWF can run as a standalone file off the server with no errors.	
While in offline mode the submit button uses server simulation	
While on the server the SWF can and transmit and receive data	

Demo Controls:

Description:	**Checklist**
User can traverse back and forward through questions without glitches	
User can reset at any time and question state will revert back to beginning state	
No cases of wrong answers marked as right	
No cases of right answers marked as wrong	
When the user presses the answer button the answer animation plays	
While an answer animation is playing the curtain is visible	
(Microstep) User can traverse back and forward through microsteps without glitches	
(Microstep) Reset sets the microstep back to 1 and reverts back to beginning state	
(Explore mode) The user can return to explore mode at any time	
(Explore mode) The user can return back to the last question from explore mode	

Miscellaneous Checks

Description:	**Checklist**
All interaction objects have the mouse cursor change to a hand while over object	
All fonts are Times New Roman, Helvetica or Futura	
Instructions text is appropriate **and written**.	
Demo title is appropriate **and written**.	