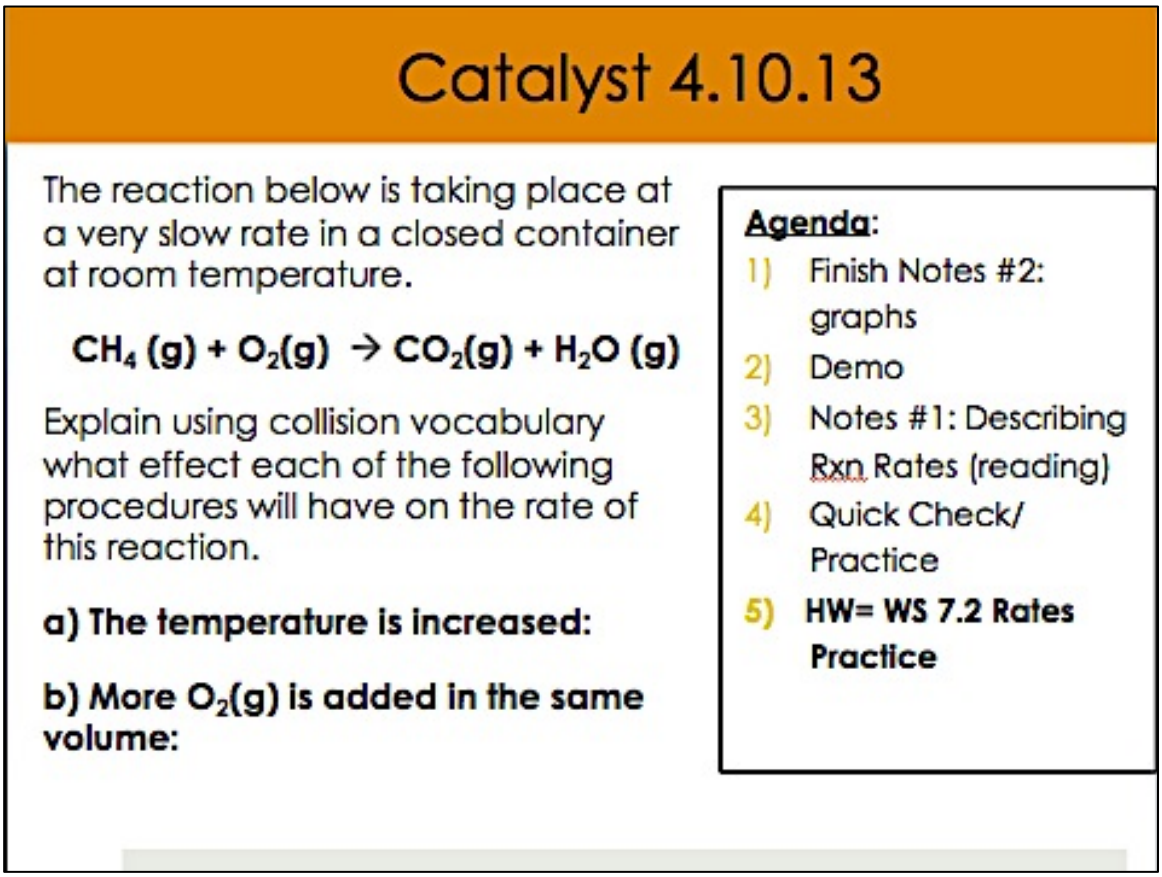
Academic Discourse Transcript– 11th grade Chemistry

At the start of class, students worked silently on whiteboards for 5 minutes on the following prompt, which was projected at the front of the classroom:



When the 5 minute timer went off, the teacher began the student-facilitated discussion.

Teacher: Who would like to start off the discussion?

Areli: I would like to start off by reading the formula. CH_4 gas plus O_2 gas produces carbon dioxide gas and H_2O gas. Shanae would you like to move us on?

Shanai: Stacey could you tell us which are the reactants and which are the products?

Stacey: The reactants are CH_4 and O_2 and the products are carbon dioxide and H_2O.

Areli: Elizabeth…[*Elizabeth's hand is raised*]

Elizabeth: I would like to answer the first question which says 'What happens when the temperature increases?' The higher the temperature, the more collisions that will happen.

Luis: [*to Elizabeth*] Can you please explain why?

Elizabeth: Nicolas, would you like to explain?

Nicolas: [*After a short ~10 sec. pause while he thinks and laughs*] This will happen because the molecules will have more kinetic energy which will cause the particles to collide more often therefore making the reaction rate increase. Daisy, do you have a question?

Daisy: I have a question about this problem. If the temperature increases what will increase, the reactants or products? [*~5 sec. pause. Brandon's hand is raised*] Brandon?

Brandon: Well, if the temperature increases, won't the reactants be consumed more making more of the product at a faster rate? [~5 sec. pause while class processes what Brandon said. Jule's hand raises] Um, Julie.

Julie: I agree. I would like to move us on to letter b "more O_2 gas is added to the reaction at a constant volume." I wasn't really sure what would happen, but I guessed that there would be more products made. [*~5 sec. pause, Shanai's hand goes up*] Shanai?

Shanai: I was confused about part b too so I left it blank. But then I remembered about the demo from yesterday with the acid and zinc. The 12 molar solution had a stronger concentration than the 1 M acid solution, so the 12 M solution reacted faster. So I put that the rate of this reaction would increase because there is more O_2 so the concentration of the reactants is greater just like in the demo. That would make more of the products in this case like you said Julie. [*many students in the class process this and seem to have "ah ha" moments*]

Areli: Does anyone have questions? Luis?

Luis: I would like to add on that if you add more oxygen molecules, you will have more collisions because there are more molecules present.

Shanai: Would someone like to close the discussion since all the questions seemed to be answered?

Areli: I still have a question. You know how when the temperature is increased it produces the products faster and so does if you add more O_2? Does this mean they have a similar impact on the reaction?

Claudia: Yes I think both a) and b) have a similar effect since they both produce more collisions.