A First Course on Kinetics and Reaction Engineering
Unit 7. Lesson Plan

Before Class

• Provide the redacted slides to the students and tell them to bring them to class

During Class

• Introduce today's topic and where it fits in the course (Slides 1 and 2)
• Review of Unit 7 (5 to 10 minutes)
  - Slide 3
• Ask whether the students have any questions from their pre-class preparation and answer them
  - Slide 4
• Learning Activity (~20 minutes)
  - Slide 5 (as groups or individually): Put the slide up, answer any questions, and tell them to outline the approach they will use to find the rate expression. Give them ~2-3 minuted to work then either have them interactively give you the steps or go directly to slide 6 and
  - Slides 6: go over the steps in the process. Tell them to proceed with the solution; circulate among them as they complete the problem, answer questions and correct mistakes or mistaken impressions you encounter
  - Slides 7 and 8: When most appear to have finished or stopped working, go over the solution using these slides
• Learning Activity (20 minutes)
  - Slide 9: Put the slide up, and point out that the reading said it doesn't matter which species one chooses from the macroscopically observed reaction, the rate expressions will be equivalent. Tell them that this activity will demonstrate that claim. Divide the class in half and read through the rest of the slide. Note that the Bodenstein steady state results are not affected, so the same expressions for Hdot and Brdot apply to all three cases. Tell half of the class to work on the rate with respect to Br2 and the other half to work on HBr. (This can work well by sending a few students from each half of the class to the board to do the writing while others in the class tell them what to do and check their algebra).
  - Slide 10: Using this slide or the results on the board, show them that the rate expressions are all the same except for an integer factor that accounts for the stoichiometry.
  - Slide 11: show them what's next and how it relates to what's already been covered

After Class

• Provide the complete slides and the solution showing the algebra for the second activity to the students.