

2017 Chemistry Olympiad Online Report for the ACS Georgia Local Section*Prepared by: Heather Abbott-Lyon**Summary for 2017*

Dr. Heather Abbott-Lyon, an assistant professor at Kennesaw State University (KSU), coordinated the 2017 Chemistry Olympiad for the Georgia Local Section (GLS) with the help of Dr. Glen Meades, a biochemistry lecturer at KSU. In November 2016, we notified the U.S. National Chemistry Olympiad Office (UNSCO) that the GLS would participate in the program. With the help of faculty at KSU and members of the GLS, we reach out to 52 chemistry teachers with confirmed email addresses at different high schools throughout the greater Atlanta metropolitan area in early December. In addition to teachers, we sent emails to the science specialists for Cobb and Fulton County using the contact information we received online, asking them to forward our invitation to teachers under their supervision. This was the second year that we emailed the dual-enrollment students at Kennesaw State University (KSU). These are high school students who advance beyond the courses available at their high school and begin taking classes at KSU. Finally, two parents who home school their children reached out to us about the competition.

35 high schools responded to our initial invitation, indicating that approximately 1590 students would participate in the exam. In order to keep our costs under control, we asked teachers to reuse test booklets if they planned to administer the exam to smaller sections of students. In total, we submitted an order for 1170 copies of the Local Exam. We received exam results for 1044 students from 32 high schools plus six additional students who were either dual-enrollment at KSU, home-schooled or from a high school that opted not to administer the exam at their location. The number of schools and student participants over the past several years are outlined in Table 1.

Table 1. Recent GLS Participation in the Local Chemistry Olympiad Competition

Year	Number of Students	Number of Schools
2010	344	17
2011	347	19
2012	402	20
2013	591	25
2014	634	23
2015	850	29
2016	937	29
2017	1044	32

Three 75-minute tutorial sessions on “Atomic Structure and Periodicity,” “Equilibrium and Thermodynamics,” and “Molecular Structure, Isomers, and Chirality” were planned to Sunday, March 5th 2017. The topics of these tutorials were chosen based on GLS student performance on the 2015 Local Exam. Given the improved performance in these areas between 2015 and 2016, we decided to keep the tutorial topics the same in 2017. Unfortunately, we did not see the same improvement between 2016

and 2017. However, we did have record attendance for the tutoring event with ~120 students attending at least one of the sessions. In particular, North Springs High School brought a record number of students.

Most of the Local Exams were mailed to participating teachers to administer at their high schools. Included in the mailings were answer sheets and a postage-paid return envelope. Teachers were asked to return their Scantrons to us with a postmark no later than March 20th. Alternatively, students were able to take the exam at Kennesaw State University on Saturday March 18th. A total of 1044 students from at least 32 different high schools took the Local Exam. This is about a 10% increase in the number of students and the number of schools participating (refer to Table 1).

The Local Exam results were used to select 13 finalists (and 3 alternates) to take the National Exam as per the Olympiad rules. Since the rules of the USNCO program do not allow more than two students from any high school to take the national exam. In the past couple of years, we have recognized the top 5% of students who took the exam within the GLS. However, this year, Scantron forms that did not allow us to scan the student's names were accidentally mailed. This meant that students names needed to be entered by hand. While we made an effort to do this, given the number of participants and the time constraints, it was not possible.

Students needed to answer at least 41 of 59 questions correctly (i.e., score a 69% or better) in order to qualify as a finalist or alternate (*n.b.*, one question was omitted due to a typo). These students will receive a certificate of achievement, which were provided free of charge by the USNCO program office. Normally the names of the GLS finalists are added to the GLS and KSU websites. However, we recently learned that student names should not be published online without the written consent of their parents. Since we were not able to obtain signed consent forms from the 2017 finalists, these names have not been published online as of yet.

The National Exam was offered at Kennesaw State University on Saturday April 22nd 2017. The exam was proctored by Dr. Meades and Dr. Abbott-Lyon and the laboratory portion was set-up with the assistance of Matthew Rosenberg, a staff member in the Department of Chemistry and Biochemistry at KSU, and several of our undergraduate teaching assistants. Thirteen students took the exam at KSU. Two students achieved the rank of Honors, scoring in the top 141 students who took the National Exam. The complete list of students who scored Honors or High Honors can be viewed [here](#).

The Local Exam results were also used to compile a report for each participating teacher. In this report, the items on the Local Exam were combined into ten chemistry topics (see Table 2). For each topic teachers could see the percentage correct for the entire GLS section, the percentage correct for their school and the percentage correct for each of their students.

Table 2. Chemistry Topics on the Local Exam

Chemistry Topic
Moles & Stoichiometry
Descriptive & Laboratory Chemistry

States of Matter & Intermolecular Forces
Thermodynamics
Kinetics
Equilibrium
Electrochemistry
Atomic Structure & Periodicity
Molecular Structure
Organic Chemistry

In addition to the reports created for teachers this year, individual performance reports based on the Local Exam were created for each of the 13 finalists in the GLS. These reports told students which answer they chose, what the correct answer was, the difficulty of the questions based on the performance of students in the GLS, and their general performance in each of the ten categories. A special tutorial session was held via a Google Hangout on Monday April 17th 2017 to help the finalists prepare for the National Exam. Unfortunately, the event was not well-attended, in part due to internet access issues for the students.

Budget

The total budget requested for the Chemistry Olympiad program in 2017 was \$2,392.38. The Chemistry Olympiad program spent \$1170.00 on exam booklets, \$655.62 on postage, and approximately \$117.33 on lunch for the 13 finalists and two proctors. These expenses, total approximately \$1942, were covered by the GLS. An additional \$152.06 was spent on Scantron sheets (\$48 per pack of 500; 1584 needed total) and were paid for by the Department of Chemistry and Biochemistry at KSU. All chemicals and materials used for the laboratory practical portion of the National Exam were also provided by KSU (\$30-50, exact costs not available). Thus, our spending for the 2015 Chemistry Olympiad Program totaled approximately \$2150, with the GLS covering about 90% of the total cost. All applicable receipts were submitted to the GLS Treasurer, Holly Davis.

Future Plans

While the program ran smoothly in 2017, the number of students and schools involved has become unwieldy for two people. Therefore, Abbott-Lyon and Meades are seeking more members for the committee from the faculty at KSU. There will be a planning meeting on Monday November 27th to make a plan for the 2018 program. The agenda for this meeting is below.

- 1) Discuss timeline for 2018 competition
- 2) Create a task list for the spring and divide responsibilities
- 3) Brainstorm ideas for the most efficient way to:
 - register high schools/students
 - handle forms, specifically related to having minors on campus
 - distribute and collect local exams
 - analyze and distribute student results

- recognize finalists (and possibly top 5%?)
 - report about events to the Georgia Local Section (and beyond?)
- 4) Discuss possibilities for the February tutorials (live streaming? grad students help? cancel them?)
- 5) Determine what's needed for an IRB - related to student data

As noted in the agenda, one concern is that we may not be utilizing best practices regarding our interaction with minors. Improving on this is a major priority for 2018. We will also discuss the proposed timeline for the 2018 program at the planning meeting. An update will be provided to ExComm after this meeting, and we are open to additional suggestions from the GLS membership on how to improve the program. Your support is greatly appreciated! 😊