Math Lab Lesson #7:
Semester Review I

What have we learned this semester?

SITUATING THE LESSON:

During Saturday Academy and Weekday, students have:

- Interpreted "squaring" and "taking the square root" as inverse operations (one undoes the other), and explored exceptions to this general principle when solving radical equations.
- Simplified square roots
- Reviewed the relationship between square roots and exponents.

Summary: In this lesson, students will:

- Start the Cumulative Review Homework
- Work in groups to create an instructional video based on problems from the Cumulative Review Homework (Activity)

Preparation Before Class: Work through all problems and watch videos in advance. Read through and annotate the Lesson Plan in a way that will be useful to you.

Materials:

- **Homework: Cumulative Review** (1 per student and instructor)
- **Math Lab Lesson #7: Group Activity** (1 per student and instructor)
- **Math Lab Lesson #7: Classwork** (1 per student and instructor)
- **Math Lab Lesson #8: Instructor Answer Key** (instructor only)
- **One Chromebook** (see notes about installing Video Recorder in Lesson Plan)
- **Blank Note Cards** (at least 5 per student)
- **Whiteboards and Dry Erase Markers** (1 per pair of students)

1st Hour

1. Lesson Launch (15 min)

A) SATURDAY ACADEMY AND WEEKDAY REVIEW

- Ask students what they have been learning in Saturday Academy and Weekday (if applicable). What has been interesting? What have they struggled with? Take a few responses and jot them on the board.
- Ask students to take out their Classwork (or Homework or Daily Double) from Saturday Academy and find a problem that they feel confident that they understand. Have students pair up and use a whiteboard to explain their work to their partner. After a few minutes, have them switch who is explaining and repeat. Circulate and listen.

B) REVIEW KEY IDEAS

- Bring the whole class together again, and ask a few students to share out what they just learned from their partner. Review any key ideas and common mistakes that you noticed as you circulated.

2. Cumulative Review Homework (40 min)

A) REVIEW OF TOPICS COVERED

- Hand out Classwork.
- Ask students "what are the main topics that we have learned about this semester?" Write a list on the board based on student responses, divided into these 4 main topics and sub-topics:
    - **Percents** (the relationship between decimals and percentages, percent as part of a whole, two-way frequency tables, percent increase/decrease)
    - **Compound Interest and Exponential Growth** (three growth models for continuous and non-continuous growth)
    - **Algebra with Exponents** (Five Exponent Laws, the relationship between fractional exponents and roots, simplifying square roots)
    - **Radical Equations** (how to solve them, where extraneous solutions come from)

B) CUMULATIVE REVIEW HOMEWORK

- Hand out the Cumulative Review Homework. Remind students that completion of this packet is mandatory, and that it will help them a lot on their Closing Assessment.
- Tell students to **identify the main topic that each question relates to and to note this next to each question** (they should follow the directions on the back page of their Classwork)
- Allow students to work in pairs. Circulate and provide support.
- Have a few students present a few problems to the whole class.
- **<u>IMPORTANT:</u> REMIND STUDENTS TO BRING THIS CUMULATIVE REVIEW HOMEWORK TO NEXT WEEK'S MATH LAB**

3. **Break** (5 min)

- Snacks and chill.

2nd Hour

4. Creating Instructional Videos (40 min)

- For the entire semester, students have watched instructional videos. Today, they are going to create one! If the class agrees, this video will be posted on the SEO Scholars website to help other students as they work through the Cumulative Review Homework.
- The product of this activity is one 9-12 minute video in which 3-4 problems are presented in a row. Logistics of how to record and save a video using a chrome book are on the next page.
- Hand out the Group Activity. Have students work in groups of 3 (or if necessary 4), and choose one problem from the Cumulative Review Homework. The problems should all be different so that no group is solving the same problem.
- Give each group 10 minutes to plan out their portion of the video. Who will say what? Who will write on the board? What will they write? What color markers should they use? And so on. Tell students to think of this activity like a rough script of what will happen on their part of the video.
- Each group's portion should be roughly structured as follows:
    1. **Introduction**: Students read the problem out loud.
    2. **What is this problem all about? :** Students explain how they identified the topic and sub-topic that this problem relates to. What clues or key words did they notice?
    3. **Solution:** Students solve the problem, explaining each step.
    4. **Check:** Students check their work, or else explain why they are confident that their answer is correct.
- Then, bring the class together and have students decide what order to present the problems. What order makes sense mathematically? Which problems are related to each other? Lead a short discussion around this.
- Divide the board into 3 (or 4) sections, and have each group write their problems clearly on one of the sections before starting to record.
- When students are ready, start to record (do a test video first to make sure the sound is working) One group after another will work on the big whiteboard (just like during presentations). Probably you should be the "cameraperson" in charge of recording with the laptop to ensure high quality (no shaking, etc).

- Ideally, students in each group will talk through the problem while they are writing (like a teacher would do). However, if some students do not want to appear on camera, they can write out their complete solution on the board and explain their work off-camera, pointing to the relevant work.
- They can also use the small whiteboards as props during their presentation.
- Students who are not in the group presenting should stay off-camera. However, they should be engaged in their role of the studio audience (clapping, cheering, laughing at jokes, etc)
- Feel free to stop and re-record parts if a student feels embarrassed or like they "messed up", however keep this to a minimum.

HOW TO RECORD AND SAVE A VIDEO USING A CHROMEBOOK

STEP 1: Log into the chrome book using the following information:
e-mail: mthomsseomath@gmail.com
Password: success1963

STEP 2: Press the bottom-left button and go to the Web Store

STEP 3: Click on "apps" then search for "Native Video Recorder." Click on "Add to Chrome" and install.

STEP 4: Open the app. When you are ready to record, hit "Start Recording." (do a test first to make sure that the sound/image quality are ok)

STEP 5: When you are ready to stop, hit "Stop Recording" and then "Save Video." It will download into the SEO Math Google Drive folder (you should see a download message pop-up on the bottom right of the chrome book). If you need to do multiple takes, that is fine but **make sure to hit "Save Video" after each take**, otherwise the previous video will be lost.

5. **Closing** (15 min)

A) MATH LAB PARKING LOT

- There will be chart paper on the wall titled "Math Lab Parking Lot." This is for students to use to bring up any questions that they have that relate (somewhat) to math. For example:
  - **Are you unsure about some idea that you learned in your SEO math class?**
  - **Are you unsure about some idea that you learned in your regular school math class?**
  - **Are you curious about something that is related to math that you saw on TV or that you heard about in the news?**
- Give students these prompts as an example of the types of questions that they can bring to add to the Parking Lot.
- Explain that each week, you will spend 5 – 10 minutes at the end of class answering these Parking Lot questions. See if anyone has any questions and write them on the Parking Lot (or have students do this). When there are a bunch, answer one if there is time.

B) REFLECTION WALL

- There will be chart paper on the wall titled "Math Lab Reflection Wall." If they haven't already, have them decide their Math Lab Team name (build a little competition into this) to add to this chart paper.
- Explain that each week, they will be asked to come to the reflection wall and write a response to a prompt. This week, the prompt is:

My favorite thing about my instructor is _____.

- After all students have written a response to this prompt somewhere on the butcher paper, dismiss the class.