Got Math?

A Newsletter from the Secondary Mathematics Team

Southern Nevada Regional Professional Development Program

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Chip Off the Ol' Block

The debate over block schedule versus regular schedule for math instruction includes discussions about time in the classroom, daily exposure to math, retention, absences, dose-size of instruction, and attention span. Common CCSD assessments and high-stakes testing requirements make it clear that teachers must provide appropriate mathematics instruction in any type of scheduling environment.

Some high schools in the Clark County School District are returning to a standard 6-period day after having been on a block schedule for a number of years. What can math teachers do to prepare for that change? What strategies have been successful?

In addition to required course content, critical components to effective instruction include bell-to-bell instruction and activities, effective transitions, well planned assignments and expectations, and effective school paperwork procedures.

The RPDP Secondary Math Team offers these abbreviated suggestions for organizing student learning based on the *Components of an Effective Math Lesson.*

Warm-Up Activity/Assignment

- Be brief. This activity can NOT take excessive minutes away from critical classroom instruction. Use a timer!
- Make it appropriate. Focus on memory review of prior skills, high-stakes test reviews, or review of prerequisite skills for the lesson.

Taking Roll/Attendance

- Make and use a seating chart from day one. Update it as needed. Take attendance from the seating chart without calling out each name to wait for a response.
- Learn students' names quickly. Consider ice-breaker activities at the beginning of the school year to remember their names.

Homework Collection/Check

Alternative assessment of homework assignments is determined by the instructor. Some options for variety may include the following:

- Develop a buddy system where students help check each other's homework.
- Students who had problems with homework may put a problem on the board at the beginning of class. Other students can volunteer or be assigned to do a problem on the board and explain it to the class.
- Do only a few problems on the board. Be selective and link similar types of problems.
- Place answers on the overhead so students can check their own/buddy's answers quickly.
- Check homework periodically for content and clarity.
- Checks can be scored in conjunction with the structured note-taking expectations.
- Grade homework with notebook checks.
- Use questioning strategies to determine adherence and effectiveness.
- Have homework turned in when the unit exam is taken.
- Allow students to check/correct homework before and after school.

Math Resources

www.rpdp.net

In this issue:

- *MAKING THE BEST USE OF CLASS TIME*
- *COMPONENTS OF AN EFFECTIVE LESSON*
- *ORGANIZING STUDENT LEARNING*

Introduction

- Be brief and specific. Much like a movie preview, the introduction should spark students' interest.
- Use real-life situations. Explain why it will be useful.
- Begin class as soon as tardy bell rings.
- Make the connection from previous homework or assignments.

Daily Review

- Briefly cover or review recent lesson(s).
- Use a warm-up activity to review.
- Reviews can serve as introductions.
- Link previous learning to the lesson.

Daily Objective

- Briefly specify the skills and information to be learned.
- Have the objective written on the board and recorded in student notebooks.
- Stress vocabulary and use appropriate language/symbols.

Concept/Skill Development

- Focus on big concepts but use simple examples at first.
- Provide all necessary information for the concept.
- Have appropriate note-taking expectations.
- Use a variety of techniques.
- Focus on student engagement.

The Best Use of Time - Organize Student Learning

Questioning Strategies
- Include a variety of learning-level questions that include expectations to define, recall, describe, analyze, and evaluate.
- Plan for appropriate wait time, feedback, and student engagement.
- Develop strategies that involve every student.
- Develop techniques to activate prior knowledge.

Student Note-taking
- Be specific and provide clear instructions.
- Be very directive and prescriptive in expectations of how students take notes.
- Develop complete, useful notes for doing homework and preparing for exams.
- Notes should include algorithms, vocabulary, procedures and open-ended questions.
- Notes should be organized so previous material can be found in student notebooks.

Guided Practice
- Students must do the work. Teachers should guide or redirect learning from teacher-lead instruction to individual student skills and independent thinking.
- Ask leading questions to guide the class to appropriate learning. Involve every student in the practice.
- Allow some time for students to think, analyze, work on problems, then to discuss solutions.
- Be careful not to allow too much time.

Group Practice
- Establish clear class procedures. For example, students can only talk to group members and the group can not ask teacher for help until everyone in the group has attempted the problem and spoken to all group members.
- Develop effective collaborative learning activities that involve every student.

Patterns
- Recognizing number patterns is also an important problem-solving skill. If you see a pattern when you look systematically at specific examples, you can use that pattern to generalize what you see into a broader solution to a problem.
- Teach or demonstrate patterns as a recurring theme in mathematics instruction. The toddler separates red blocks from blue blocks. The separation is a pattern - the reds go here, the blues go there. The kindergartner learns to count - the numbers are a pattern. A first grader makes a pattern with stamps or stickers - tree, turtle, tree, turtle. The fourth grader notices that multiples of five end in five or zero - yet another pattern. Sixth graders make tessellations - patterns that cover a plane. High school students learn that mathematics from algebra to calculus is all about functions, or the pattern of how one number changes into another.

Memory Aids
- Include oral recitation for learning/memorizing facts and algorithms.
- Consider mapping, diagrams and images.
- Flash cards may be useful for quick practice.
- Use mnemonics, acronyms, songs, etc.

Technology Implementation
- Use technology to enhance investigations and motivate students.
- Technology can provide the 'ah-ha' moments for students to see the patterns and solutions.
- Utilize graphing calculators.
- Use appropriate computer software such as Geometers' Sketchpad for specific lessons.

Homework Assignment
- Make homework an extension of class work.
- Set standards (size of paper, titles, show work, write out the problem, circle answers; etc).
- Include reading, vocabulary and notation.
- Include procedures and open-ended questions.
- Provide clear expectations and inspections.
- Assign problems that are manageable for completion in a reasonable amount of time at home.
- Homework should be used to teach students how to study for assignments, unit exams, and high-stakes tests.

Closure
- Summarize the new material. How does it apply?
- Have students explain what they learned today.

Long-Term Memory Review
- Be brief and repetitive. This activity should take no more than 5-7 minutes.
- Address basic skills, formulas and facts.
- Use LTMR resources from *www.rpdp.net.*
- Teach students how to study.
- Utilize appropriate memory aids.
- Make time for high-stakes test review and practice.

Teacher Preparation - Collaboration - BAM

The best recipe for success is common collaboration and planning with department members. Teachers working together toward common goals and targets form an effective team for success.
- Test questions should include the types of questions seen on homework - vocabulary, notation, short answer, review, procedures, etc.
- Plan for each unit by determining what students should know or be able to do at the end of the unit.
- Identify what assessment will verify that students have learned the material.
- Develop plans to instruct students. Include student notes, practice, homework, and activities.
- Include test questions in daily instruction.