

Re-Teaching Algorithms

Program Summary

Developmental students often have seen many algebraic procedures in previous classes but have misunderstandings and do not execute the procedures well. They have difficulty identifying their mistakes. Unfortunately, they also often “tune out” when the concept is re-taught. In this session, some strategies for re-teaching these important procedures will be discussed.

Laura Bracken

Lewis-Clark State College

bracken@lcsc.edu

Developmental students:

1. Often have attention span and focus “issues.”
2. Lose focus when material is familiar.

3. Lose focus when material is “easy” – if trial and error or inspection is an option for easy problems, they tune out.
4. Often state that they can “do” math but cannot “explain” how they do it.

5. Often state that they “go blank” on tests.
6. Often have seen or even tried many of the algorithms we are teaching them.
7. Often have misunderstandings about concepts or procedures of basic algorithms.

Sample Misunderstandings

1. PEMDAS
2. Properties of equality
3. Exponent laws
4. Clearing fractions.
5. Using $y = mx + b$
6. Domain and range of a function

Teaching a developmental math student the same math that was not mastered before ---

- in half the time (a semester)
- with fewer contact hours per week
- with more distractions
- and more pressure

---requires patience and creativity.

One strategy:

Use carefully constructed cooperative group activities combined with whole class instruction to teach and re-teach algorithms.

You must be willing to do:

- Some student training in group work and social interaction.
- Some community building.
- Some shifting of responsibility for explanations from the instructor to the student.
- Assessments that motivate the student to engage in learning.

Practical Advice.

- Sandwich activities between introduction and summary.
- Grade work as a group using a rubric. Substitute for attendance/participation grades. Ask for verbal as well as written explanations. Look at everyone's work *some* of the time.

- Don't answer too many questions; ask more questions than you answer.
- Emphasize that you are in control and that it is not a race. Have an ending activity in your class so that fast work is not overly rewarded.
- Write the activity so that there is enough practice to keep the faster groups busy.

- Get to know students personally as you move from group to group, even if it takes the group off task occasionally.
- Make office hours appointments for extra help during group activities.

Examples – Handouts.

- Multiples of Ten
- Simplifying Exponential Expressions
- Fractions, Rational Expressions, and Multiplication
- Common Denominators
- Equations and Solutions
- Rearranging Equations

Guidelines for Writing Activities.

1. Remind or ask students for prerequisite knowledge. May reinforce a pre-activity lecture.
2. Limit what is taught in each example. Use more examples rather than complicated examples.

3. Require student explanations *in their own words*.
4. Include sufficient but not overwhelming number of checkpoints.
5. Provide sufficient practice to allow for variation in group speed.
6. Use group reporting to learn from others' work.

Write a 20-minute activity.

Skill:

Clearing fractions from a linear equation in one variable.

Assume that students are reasonably adept at solving equations.