

Action Research

Do students have better retention of concepts when they discover them for themselves?

This was our (Hallie Foster and myself) main objective when we began this project to teach circumference and pi.

DAY 1

The first day's lesson was to cut four or five cardboard circles made with compasses. After the cutting was complete, the students were to measure the distance around each circle with a piece of string. Then the students were to calculate the value of the string's measurement (circumference) divided by the diameter. As a class, we then listed our new-found values on the chalkboard to compare with one another, only to discover the students all had calculated approximately the same value, regardless of the size of the circles.

What they had discovered, of course, was the value of pi!

DAY 2

On the following day, as a follow up to pi, the students' task was to measure the distance of the hallway using only a bicycle wheel as a measuring device. Without further instruction, they were to determine how to accomplish this goal. As a result of the previous day's lesson, this task was not as impossible as it could have seemed for them. Having learned the value of pi, the students realized by counting the number of revolutions of the wheel, the hallway's length could be calculated. (Students waiting to measure the hallway were given

smaller wheels to figure lengths of various items in the classroom.)

Like the previous day, we did a class comparison with our final calculations, only to find, once again, all had figured approximately the same distance.

We had hoped by this point, the students had learned of the relationship between circumference, diameter, and pi.

FOLLOW-UP

Approximately seven weeks later, five students of varying academic abilities were selected to be interviewed about the project and what they remembered about circumference and pi. Due to the length of time that had lapsed since these lessons and the skill levels, it was predicted that perhaps, two of the five would be able to recall the information. Much to our amazement, all five students had retained the process of how to find circumference and the value of pi!

Perhaps, the "self-discovery" truly was crucial in the retention of these mathematical concepts. In fact, one student's response during the interview was "When you do something, you remember it better".

We couldn't have said it better ourselves!