Word Problems a Problem? WHAC 'Em

Harold Torrance

No, not the students! WHAC is the name of a strategy that students can use for solving word problems. It provides a systematic method for approaching and solving even the most difficult problems. WHAC is also easy for students to learn initially and put into use.

Many students encounter difficulty correctly solving word problems. This is a situation often encountered at all levels from elementary through high school. Numerous books and research studies have outlined causes for this inability to solve word problems, but few strategies have been offered to actually address the problem. WHAC is a simple strategy that I've used with quite good success in both elementary and middle grades classrooms. Students are given a set procedure to use for tackling any word problem. The approach is designed to analytically guide them through a given problem in organized steps.

The only prerequisite for using this strategy is a simple matching of objective to entry behavior. For example, if the problem will eventually call for a student to add two numbers, then the student must already be capable of computing the sum of two numbers. For the WHAC strategy to work successfully, the student's entry behavior must correspond with the computational operation which is being called for in the problem. Computation is usually the easiest part of mathematics for students anyway. WHAC helps students with the most difficult, higher-order reasoning by giving them an initial foothold to the problem.

The WHAC strategy is composed of a four-part process that is used virtually the same way each time a word problem is attempted. This prevents students from rambling without a place to start, or trying to answer a problem without first knowing what is being asked. I've found that students learn the process quickly and are able to use it successfully for solving problems.

What follows is an explanation of WHAC and an example of how it is actually used. The strategy can be taught as a group activity or to individual students as needed. I've used it for both enrichment and remediation purposes, though I think it is best used as a whole-class activity.

WHAC stands for What, How, Action, Complete. These four words outline the four-step process:

1. What is the question asking?
2. How do you go about solving it?
3. Action is taken to do the actual computation.
4. Complete the problem by answering it.

Example Problem

A bicycle shop has 23 red bikes, 14 blue bikes, 11 black bikes and 9 green bikes in stock. They can special order other colors, but none are currently in the store. What is the total number of bikes in the shop which are either red or green?

Step 1. What Is the Question Asking?

After the problem has been read through, show students how to focus on this one part of the problem. They should be able to see that the question simply asks how many bikes are either red or green. I typically ask students to jot down a shortened version of the question so that it is not forgotten while they are doing the actual computation.

How many bikes are red or green only?

Step 2. How Do You Go About Solving It?

This particular problem asks only for the total number of bikes that are either red or green. Students should be able to see that the information given about blue and black bikes will not be used. The information about ordering other colors is also superfluous. At this point the plan for solving the problem is written out by the student.

Combine the number of red bikes with the number of green bikes. Add them.

Step 3. Action Is Taken to Do the Actual Computation

Here the problem is set up and computation done.

23 red bikes
\+ 9 green bikes
32 bikes which are either red or green

Step 4. Complete the Problem by Answering It

In this step it is useful to have students refer back to Step 1. They can then fashion an answer based on

what they previously determined was being asked in the problem. For word problems, I have asked students to answer with a complete sentence.

The total number of bikes in the shop which are either red or green is 32.

As students become familiar with thinking through a process for solving word problems, they will become more comfortable in working even multistep problems. WHAC gives students a tangible place to start a problem, replacing frustrated guessing with a deliberate course of action. Through greater confidence, students are empowered to do their best.

Wreck of the Hesperus

When an emigrant ship, bearing the ill-fated name Hesperus, was wrecked off Turtle Island, the authorities voted to donate $1,000 to the survivors. This sum was divided among the men and women who were eligible, and their 20 children, in accordance with an agreed scale. Each child received the same number of dollars; each woman received six times as much as a child; each man, $5 more than each woman. There were exactly twice as many men as women. The Hesperus carried 118 passengers. How many survivors were there?