

Code Breaking in the Classroom: Using Math and Having Fun

New website helps teachers create math codes

Children love to break codes. In the 1930s, thousands of children sent away for Orphan Annie decoder pins so they could break the secret messages given on the radio each week. More recently, our students have raced against characters in *Ghost Writer* or Jack and Annie of *The Magic Tree House* to decode secret messages and solve the mystery before the fictional kids do. Today, teachers can use a new internet tool to create secret messages for their students who will have to use their math skills to break the code. The tool takes the specifications of the user and produces a PDF document that can be printed out and given to the students.

The kind of code that can be generated is a popular one in math workbooks. The secret message is a phrase of text, such as “Look under your

desk.” Each letter in the secret message is placed next to a math problem. When the math problem is solved, the answer can be matched to a number printed below a blank at the bottom of the page. When all the math problems are solved, the entire secret message is decoded. (See Figure 1.)

The math problems can be of any degree of difficulty, using addition, subtraction, multiplication or division, or any combination of those. The user may specify ranges for the operands (the numbers being added, subtracted, etc.). For example, a 1st grade teacher might specify to use addition with operands between 0 and 9 (see Figure 1), or a 3rd grade teacher might specify addition and subtraction with operands between 50 and 150 (see Figure 2). Other specifications are possible, such as vertical or horizontal problem layout (see Figure 3) and whether or not fractional answers are allowed in division problems.

For each code page, there is an option to put a bit of text at the top of the page. This may be used to give directions or to ask a question whose answer is the secret code. This gives the teacher the opportunity to integrate math into other topics throughout the day. The possibilities are endless. Here are just a few ideas:

1. Codes could be used as an incentive or treat when a student has ac-

completed a certain task or behaved especially well. The code could even lead to the incentive the teacher has hidden (candy, free time pass, etc.). See Figure 1.

2. The secret message could be a fact about something that they are already studying. “What is the capital of Burundi?” Decoded answer: “Bujumbura” or “Tyrannasaurus Rex was a ?” Decoded answer: “carnivore.” All the codes could be the same, or you could print up several different codes so not every child has the same answer. See Figure 2.
3. You could give children access to the site and they could design codes for their classmates.
4. The secret message could be the punch line to a joke or riddle. “Who is a chicken’s favorite composer?” Decoded answer: “Bach, Bach, Bach.” See Figure 3.

We have used some of these ideas over the last four months on a small set of children, and they love the codes. They keep asking for more. It’s as if they don’t realize they’re doing math. Of course, there are many more ways this program could be of use in the classroom. We’d love to hear what you have done with it. The web site is <http://www.uwsp.edu/math/afelt/>

`codes.html` and its use is free and unlimited. Have fun!