

[MICROSOFT](#)

[PRODUCTS](#)
[SEARCH](#)
[SUPPORT](#)
[SHOP](#)
[WRITE US](#)
Microsoft

home

▶ [Lessons at a Glance](#)

Lessons

[All About Me](#)

[Animal Logic](#)

[Bridging the Generation Gap](#)

[Buy Low/Sell High](#)

[Buying a Dream Car](#)

[Campaign Hot Buttons](#)

[Candy is Dandy](#)

[Celebrate the U.S.A.](#)

[Code Crackers Math Game](#)

[Creating Your Own Web Site](#)

[Don't Trash the Earth](#)

[Endangered Species](#)

[For the Record](#)

[It's All in the \(Chocolate\) Chips](#)

[Just Desserts](#)

[Making Ends Meet](#)

[Newsworthy Journey](#)

[Nutrition Track](#)

[Planning a School Event](#)


[Solving Polynomial Equations](#)

[Space Case](#)

[Three Squirrels and a Pile of Nuts](#)

[Traits R Us!](#)

[Understanding Poetry](#)



Code Crackers Math Game

Subject: Math

Grade Level: Middle School

Required Software: Microsoft® Excel 97

▶ [Teaching Guide](#)

▶ [Student Activity](#)

Teaching Guide

Summary

This engaging and challenging math game provides students with opportunities to work with math operations and simple algebraic equations by creating a spreadsheet-based "rule machine."

Objectives

To build students' skills in math operations and algebraic thinking, to put spreadsheets in students' hands as problem-solving tools, and to promote cooperative math learning.

Prerequisite Skills

Understanding of Microsoft Excel spreadsheet use and fluency in math operations and basic algebraic thinking.

Time Alloted

One class period

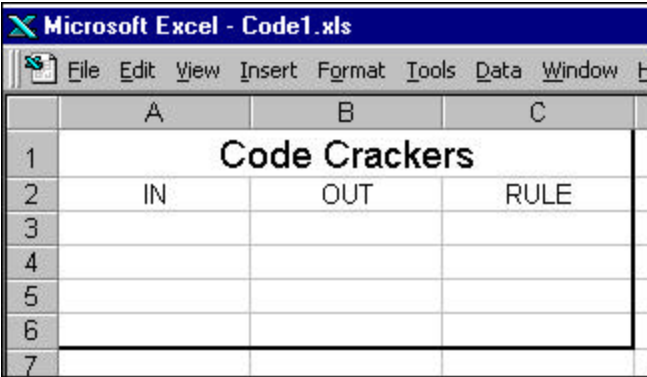
How to Begin

Introduce the game by demonstrating how math operation "rules" work. On an overhead or the chalkboard/whiteboard, write the following headings: In, Out, Rule. Tell students that what you've created is an old-fashioned Code Cracker math machine. Write the number 2 under In; under Out, write 14; leave Rule blank for now.

Ask students for three or four possible formulas you might have used to get from 2 to 14; when they all call out 2×7 , tell them that your formula, or rule, uses two math operations, not just one. Write their guesses under Rule.

Next, write several other Ins and Outs based on the same rule, such as 4, 24 and 7, 39. Ask students to keep guessing until they figure out that your rule is $5 \times (\text{In}) + 4$.

Give students a few minutes to write and test their own rules, then ask for volunteers to try stumping the class using your old-fashioned Code Cracker.



	A	B	C
1	Code Crackers		
2	IN	OUT	RULE
3			
4			
5			
6			
7			

Then, using a large monitor or LCD projector, demonstrate how to set up a modern Code Cracker using Excel. (Follow the model above, and check the Student Activity directions on the next page for set-up details.) Run through a few practice rules, showing students how to create and copy the formula in column B and what happens when you type different variables in column A. Ask students: How is Code Cracking different with this machine?

Have each student choose a partner, hand each team a copy of the Student Activity page, and let the code cracking begin!



Student Activity

Description

With this math game, you and your partner will take turns posing math rules and trying to guess them using a worksheet "machine" you create with Excel. Whoever guesses the most rules quickest, wins!

STEP 1 *Make Your Machine*

SOFTWARE: Microsoft Excel

WHAT TO DO: With your partner, decide who should go first. Partner 1 should then follow these steps while Partner 2 is not looking.

1. Launch Excel, open a new worksheet, and save it.
2. Follow instructions in the Tip box, below, to set up your Code Cracker machine.
3. Type a number in cell A3. In cell B3, type a rule (formula) that uses the number in cell A3.
4. Remember to start your formula with an equal (=) sign. Use at least two but not more than three math operations in your rule.
5. Select your rule, click on the fill handle in the corner of the cell, and drag to copy it in B4:B7.
6. Type a different number in each of cells A4 through A7; cells B4 through B7 will show values that represent your rule. Save your work.
7. Hide your rules by clicking on the View menu and deselecting Formula Bar.

TIP

To set up your spreadsheet:

1. Type Code Crackers in cell A1.
2. Highlight cells A1:C1.
3. On the Format menu choose Format Cells.
4. Click on Alignment, choose Merge Cells, then click OK.
5. Click the Center button to center the text across columns A:C.
6. In cell A2, type In. In cell B2, type Out. In cell C2, type Rule.
7. Select cells A2:C2 and Center your text.

STEP 2 *Crack the Code!*

SOFTWARE: Microsoft Excel

WHAT TO DO: Now Partner 2 will try to guess the rule Partner 1 has devised. Your time limit: two minutes!

	A	B	C	D	E
1	Code Crackers				
2	IN	OUT	RULE	TALLY	
3	4	13	4*3+1, 4*4-3	Robert	8
4	7	19		Martha	5
5	5	15			
6	11	27			
7	8	21			

Create and hide rules in column B for your partner to guess!

Look carefully at the numbers in columns A and B. What rule, using more than one math operation, could turn A into B? Click cell C3 and type in your main guess plus some other guesses. Click on cell A4, and replace that number with any one you choose. What do you see in B4? Review and revise your guesses if necessary. Try out more numbers in column A until you feel absolutely sure of the rule, or until your time's up.

STEP 3 *Tally and Switch*

SOFTWARE: Microsoft Excel

WHAT TO DO: Partner 1 can now reveal the rule by clicking on cell B3. Did Partner 2 guess correctly? If so, she or he gets 5 points - plus 1 additional point for every other workable rule. Tally the points in an empty place on your worksheet, then switch places so Partner 2 creates rules for Partner 1 to guess. Whoever reaches 50 points first, wins!

