What is a cloze?

A cloze is one method to determine if a student is capable of comprehending a text. To perform this assessment, the instructor takes a portion of the text the student is going to read and systematically removes several words from it. Then, the student is given the task of filling in the words that are removed. If the student is unable to fill in the words correctly, then he or she is unable to comprehend the text. Let me guess what question you may be asking right now, "Why am I reading about how to test if a student can read a book or not in a math teaching article?" I plan to show two different ways to use clozes to help students learn algebra and other mathematical topics.

Polynomial Vocabulary Cloze 01 Name: _____

In the expression "3^{5}", 3 is the _____ and 5 is the _____. "$3x^{2}$" is a _____, "1-5y" is a _____, and "$2x^{2}$-5x+3" is a _____. When you _____ a term you raise it to the third power.

Review:
"-6/7" is the _____ of "6/7". The _____ of "2/3" is "3/2". In the _____ "7y-2", 7 is the _____, y is the _____, and -2 is the _____.

An _____ is a mathematical relationship that says one quantity is smaller than another. The inequality "6u<18" reads 6 times a number _____ 18. The expression "18-6u" reads six times a number _____ 18. The expression |-17| reads the _____ of -17.

is less than	*expression*	*absolute value*	*base*
reciprocal	*exponent*	*variable*	*cube*
less than	*inequality*	*monomial*	*opposite*
coefficient	*binomial*	*constant*	*trinomial*

(fig 1)

Using a cloze to help students with vocabulary.

The most obvious way to use a cloze is to help students learn vocabulary. I use the same techniques as a traditional cloze and simply have the vocabulary I want the students to learn be the blanks. An example of this can be found in fig 1. Unlike a traditional cloze used to assess reading comprehension, I provide the answers at the bottom to help the students.

Version A

$3(5x-3)+4(6x+7)$
$=15x-9+24x+28$
$=15x+\square x-9+\square$
$=\square x+\square$

Version B

$\square(\square x-\square)+4(6x+7)$
$=\square x-\square+24x+28$
$=\square x+24x-\square+28$
$=\square x+\square$

(fig 2)

The Algebra Cloze

I am lucky enough to work at a school that is made up of SLCs (Small Learning Communities). Because of this, I share all of my 9th grade algebra students with one English teacher. One day, during passing period, we were talking about how we structure our classes, and he told me that he has his students do a cloze activity during the last 10 minutes of class each period.

I thought to myself, "Anything done in an English class can be done in an algebra class." This is how I created what I call the algebra cloze. To do this, I take a multi-step algebra problem and work it out to completion. Then, similar to the reading cloze, I systematically remove several key parts of the work. Carefully consider the parts to be removed from the problem. If you remove the wrong parts of the work, the students will not be learning the math concept you want them to learn. Also, if you remove too much of the problem, then the students will not be able to complete the cloze.
In order to demonstrate this, I created three clozes for simplifying the expression $3(5x-3)+4(6x+7)$. Versions A and B of this cloze can be found

in fig 2. Version A is not an example of a good cloze because it only requires the students to know how to collect like terms and does not address the distributive property. Version B is better, but it does not lead to an exact solution. The value of an algebra cloze can be found in Version C (fig 3). As you can see, while the student is working on this cloze, he or she has to think both backwards and forwards. This challenges the student who is already strong in the concept and is also accessible to students who still need additional help. A struggling student my not know how to complete the first box in the Line 2 , but will know to complete the second box in the same line because the answer is simply 3×3. Also, notice in this cloze students are discovering how to factor by grouping when they are filling in the two blanks " $4(\square x+\square)$ " in Line 1.

Version C

Line 1: $3(\square x-3)+4(\square x+\square)$

Line 2: $=\square x-\square+24x+28$

Line 3: $=\square x+24x-9+28$

Line 4: $=39x+\square$

(fig 3)

How I use cloze in my algebra classroom

Clozes, both in vocabulary and algebra, are effective reviews for topics covered. In my algebra SDAIE (Specially Designed Academic Instruction in English) class, I teach vocabulary by using my word wall during instruction and having the students make and study vocabulary cards. To help my students master vocabulary, I give them a vocabulary cloze and then have them complete as much as they can without their vocabulary cards for 7 minutes, then I let them use their vocabulary cards to complete the cloze.

I use an algebra cloze during the last 10 minutes of class to help students review. Each student gets their own algebra cloze printout, and it is also projected on the whiteboard. In the last two minutes of class I call on students to fill in the blanks in the algebra cloze.

As you can see, these types of clozes can be used for any multi-step math problems, not just in algebra 1. Other topics where math clozes can work is in adding and subtracting fractions, order of operations, long division, and many topics beyond algebra 1. The next two pages are handouts of clozes for use in an algebra 1 classroom.

Student Handout 1 (expressions)

$$5x-\square\left(2x^2-5\right)-\left(3x+\square\right)$$

$$=5x-2x^{\square}+\square-\square-4$$

$$=\square x^3+\square x-\square$$

Student Handout 2 (equation)

$$\square-\square\left(3x-\square\right)=x+\square$$

$$\square-6x+2=x+\square$$

$$7-\square=x+\square$$

$$\begin{array}{llll} -7 & -x & & -x-7 \\ \hline & -7x & = & 0 \end{array}$$

Student Handout #3 (equation)

$$\frac{\square}{1}\left(\frac{x}{3}-\frac{5}{\square}=\frac{\square}{2}+1\right)$$

$$\begin{array}{llllll} 4x & - & \square & = & 18x & + & \square \\ -\square & & +15 & & -\square & & +15 \\ \hline \dfrac{-14x}{\square} & & & = & & & \dfrac{27}{\square} \end{array}$$

Student Handout #4 (slope)

Find the equation of the line that goes through the points $\left(5,\square\right)$ and $\left(\square,7\right)$.

$$m=\frac{\square-3}{2-\square}=\frac{\square}{\square}$$

Student Handout #5 (systems)

$$2x-3y=\square$$

$$\square x+\square y=1$$

$$\frac{6x}{\square}=\frac{\square}{\square}$$

$$x=1$$

Back Substitution

$$2(\square)-3y=5$$

$$-\square \qquad -\square$$

$$\frac{-3y}{-3}=\frac{3}{-3}$$

$$\square=-1$$

Student handout #6 (monomial)

$$\frac{5x^{7}y^{\square}}{\square x^{\square}y^{9}}=\frac{x^{-2}y^{-5}}{3}=\frac{\square}{\square x^{\square}y^{\square}}$$

Student Handout #8 (quadratic)

Solve: $\square x^2+4x-\square=0$.

$$x=\frac{-\square\pm\sqrt{\square^{2}-4\bullet 3\bullet(-1)}}{2\bullet\square}$$

$$=\frac{-\square\pm\sqrt{16\square 12}}{6}$$

$$=\frac{-\square\pm\sqrt{\square}}{6}$$

$$=\frac{-4\pm\sqrt{\square\bullet 7}}{6}$$

$$=\frac{-4\pm\square\sqrt{7}}{6}$$

$$=\frac{-\square\pm\sqrt{7}}{\square}$$

Student Handout #7 (polynomial)

$$(x+4)(\square+5x-1)$$

$$=3x^{3}+\square-x+12x^{2}+\square-4$$

$$=3x^{3}+\square+\square+19x-\square$$