

Support for Student Literacy

Introduction

In today's schools, many students struggle with English language literacy. Some students grow up speaking, reading and/or writing other languages before being exposed to English. Other students grow up speaking English but have not yet acquired strong literacy skills. It is essential that we use strategies that support the development of literacy for all students, especially those who struggle with reading and writing in English.

Many effective support strategies are embedded within the CPM curriculum. In addition, this section is designed to provide additional strategies for further supporting literacy in teamwork, whole class discussions, and writing activities.

Strategies that require students to generate ideas (student-driven literacy strategies) are most effective for many reasons. It is important to allow all of our students the opportunity to connect meaning of new vocabulary to their own prior understanding and experiences through activities that help them to recognize these personal connections to new ideas, whether the content is mathematical, language, or anything else. Allowing students to generate their own vocabulary lists or find challenging words themselves enables them to build strategies that can effectively help them beyond their math class. Learning is much more effective when students have a sense of ownership or connection to it. Whenever possible, allow students to generate their own vocabulary lists, discuss the meaning of a portion of text, and provide them opportunities to make sense of new words. Monitor these efforts for accuracy as you circulate among the study teams during class.

Taking time in class to focus on supporting literacy is beneficial to all students, not just those who may be identified ELL. Many of the effective strategies for supporting English language learners are the same strategies found most effective to promote learning for all students. One goal of the CPM curriculum is to provide multiple learning strategies so that all students will have access to learning mathematics.

Literacy Resource Guide

Several of the resources listed below are explained in this document. Others that are included in the *Connections* texts are marked with “*.”

If the Literacy Challenge is:	For Intensive Intervention:	Moderate Intervention:
Understanding math tasks	<ul style="list-style-type: none"> • Paraphrasing for (or with) students • Supported Word Attack 	<ul style="list-style-type: none"> • Students Paraphrase • Independent Word Attack
Communicating understanding orally and through writing.	<ul style="list-style-type: none"> • Concept Maps* • Introducing Ways of Thinking* • Using Focus/Target Questions* • Team Roles Sentence Starters* • Ways to Contribute to Team Learning* • Team Discussion Sentence Starters* 	<ul style="list-style-type: none"> • “Making Connections:” Concept Maps* • “Summarizing My Understanding:” Graphic Organizers* • Verbalizing Ways of Thinking* • Team Roles*
Writing about math	<ul style="list-style-type: none"> • Writing Templates • GO – Graphic Organizers* 	<ul style="list-style-type: none"> • Math Sentence Starters* • Learning Logs* • GO – Graphic Organizers*
Building Math Vocabulary	<ul style="list-style-type: none"> • Predicting Meaning • Generate Graphics • Logging Math Meanings in notes (as formalized in text)* • Vocabulary Theater 	<ul style="list-style-type: none"> • Students “Teach” Each Other • Alternative Representations • Paraphrasing • Encouraging Usage
Building Academic Vocabulary	<ul style="list-style-type: none"> • Personal Dictionary • Vocabulary Reference Cards • Word Attack • Vocabulary Theater • Word Posters • Paraphrasing for (or with) students • Synonym Maps • Process Word Wall 	<ul style="list-style-type: none"> • Word Choice Stories • Students Paraphrase • Encourage Usage

Resources that support literacy in the textbook

Team Roles and Other Support for Managing Effective Study Teams

One of the most effective tools for helping students understand new mathematical content or new vocabulary is to provide them with opportunities to discuss their understanding and to listen to and question that of their peers. The *Connections* texts provide teachers extensive suggestions for establishing and maintaining a team roles structure in the “Study Team Strategies” tabbed section of the Teacher Binder. In addition, there are regular suggestions for using team strategies in the lesson notes. These notes discuss the use of focus questions, team role sentence starters, and modeling dialogue, and how students can contribute to a team.

Discussion Points and Focus Questions

Discussion Points and Focus Questions appear in many *Connections* lessons. As well as framing the mathematical task, they give students ideas for language they can use to ask mathematical questions. Many of them also focus on reading comprehension, asking students to discuss things like, “What is this problem about?” or “What are you being asked to find?”

“Making Connections” Concept Maps in Chapter Closure Activities

In this section of each chapter closure, students create concept maps using lists of vocabulary. Students generate their own lists in a brainstorming format. A list is provided in the text as well. By deciding what words and ideas are connected to which others, students build understanding of each of the individual words and ideas in the chapter. Often in team conversations, a teacher leading this activity will overhear students saying, “Are these ideas connected?” or “Wait, what does this word mean?” The ensuing conversation is invaluable to that student’s understanding of the vocabulary and of the content they are discussing.

“Summarizing My Understanding” in Chapter Closure

In this section of each chapter closure, students are asked to demonstrate what they have learned about one or more of the major ideas in the chapter. In most chapters, graphic organizers (or GO pages) have been included to provide structure to support students.

Focus on Multiple Representations

In *Connections*, there is a strong emphasis on supporting students in understanding the connections between multiple representations of mathematical relationships. Thus, students who may struggle with a particular way of doing a problem can turn to their breadth of understanding to find other, creative ways to make sense of the ideas. If students struggle, for example, with describing the slope of a line, they can show their understanding by making a table or drawing a graph.

“Summarizing My Understanding” in Chapter Closure

The *Connections* courses emphasize various ways of mathematical thinking. For example, in *Algebra Connections* they are: **generalizing, reversing, connecting, justifying, and applying and extending**. Students use them to solve problems. (They are explicitly included in problem statements.) See the introduction to closure in the front of this Teacher Edition and the Chapter 1 notes for more details.

Additional Support Strategies

Strategies for Individual Students (at home or in class)

Student Response Templates

For some assignments, it can be beneficial to provide writing templates for students who struggle with language. Examples of student response templates for a few assignments and activities can be found at the end of this document. It is fairly easy to adapt these models for any concept or skill from the course.



Paraphrasing

When students face linguistically challenging word problems, they should attempt to paraphrase the math task. If they can do so, it is not important that they understand every word. Encourage them to achieve functional literacy by focusing their attention on words that must be understood in order to complete the problem in front of them. If they cannot paraphrase the math task clearly, they can learn to select from a variety of strategies:

- They can use context clues to figure out the meaning of the word by thinking of known words that can be substituted into the sentence to replace the unknown word. This strategy allows them to get a basic sense of what the unknown word means.
- They can use the textbook glossary to look up the meaning of the unknown word.
- They can use a dictionary to look up the meaning of the unknown word and test for the best definition by substituting multiple definitions into the sentence in the textbook containing the unknown word.

Personal Dictionaries


Personal dictionaries allow students to take responsibility for their own vocabulary development outside of class time. This strategy can be an ongoing practice throughout the year. Students keep a vocabulary chart for new words and revise it as they increase their understanding of the words. The chart could look something like this:

word	part of speech	synonym (1 or 2 words)	complete definition	image/ drawing
examine	verb	Look closely	To study or analyze:	
comprehend	verb	understand	to grasp the nature, significance, or meaning of	

Vocabulary Reference Cards

Vocabulary reference cards include the same information and serve the same purpose as personal dictionaries, but allow students to organize this information spatially. Students complete one 3x5 index card for every new word. Cards may be hole-punched and kept together with a binder ring or with string. Each card includes the following information:

○	word (part of speech)	image or sketch
complete definition	synonym	
context sentence: copied directly from the textbook, including the page number on which the new word first appears		
original sentence: students write their own sentences, emulating the way the word is used in the context sentence		

○	examine (v)	
To study or analyze.	look closely	
context sentence: Examine the graph at right and answer the following questions.		
original sentence: After my test is graded by the teacher, I examine the corrections to learn from my mistakes.		

Word Attack

Word attack is a strategy that helps students navigate word problems on their own, by training them to practice and eventually internalize the vocabulary strategies of skilled readers. This strategy can be used in teams during class time or at home as individual practice, although before students are expected to use it on their own, it should be practiced in class.

- Students read the problem to identify essential words (words that that a reader *must* understand in order to complete the problem).
- Students guess possible meanings of the word based upon the way it is used in context and create a list of ideas.
- Students look for word parts they understand and revise their list of possible meanings.
- Students compare their possible meanings with a formal definition (found in a dictionary, online or provided by the teacher).
- Students create a sentence, putting the word into an original context.

For example, a student may struggle with the direction, “Use mathematical reasoning to solve the problem.” They may identify “reasoning” as an essential word. They may then use the context to guess the following list of meanings: skills, thinking, help, talking. All of these words would make sense as replacements for “reasoning” in the original sentence. Then, examining word parts, students could use their own experience with “reason” to recognize that it has something to do with talking or thinking. They would then eliminate “skills” and “help” from their list, and create a sentence using “reasoning.” For example, “I used my reasoning skills to figure out how to buy books on the Internet.”

Strategies for Class or Teams

Team Discussion Sentence Starters:

Many students who struggle with language are reluctant to join team or class conversations. They often feel self-conscious about their ability to communicate verbally. Yet, verbal interaction is essential for constructive teamwork. It is often useful to provide sentence starters for students to use in team discussions. The following list of sentence starters can help support team discussion for all students. Many teachers put sentence starters such as these on the walls of their classroom so that students can refer to them during any discussion. Some teachers also provide copies of lists like this for teams to keep on their table as they work. Each student should keep a copy in their binder.

To share new ideas. . .

What if we tried _____?
I have another approach to the problem. How about _____?
Here's another possibility. We could _____.

To disagree respectfully. . .

That is one good approach to the problem, but what about _____?
I understand what you're saying, but _____.
I'm not sure that will work because _____. What if we tried _____?

To recognize good ideas. . .

That's a great insight, [Name].
Very impressive thinking, [Name].
Nicely done, [Name].

To ask for more ideas. . .

Can we think about this in a different way?
Can anyone suggest a different approach?
Does anyone have anything new to add?

To add on to others' ideas. . .

[Name], your idea makes me think about _____.
I like your thinking, [Name], and it made me realize _____.
I understand what you're saying, and I'd like to add _____.

To help clarify ideas. . .

Could you explain what you mean by [other person's idea here]?
Could you explain that another way?
What part of the problem is hard to understand? What can we do (what do we need to know) to clear up our confusion?

To summarize ideas already shared. . .

I hear you saying _____. Is that right?
[Name] suggested that _____. What do the rest of you think?
I like [Name]'s idea that _____.

Paraphrasing

Overview and How to Launch:

Paraphrasing is especially useful when students face a complex or text-heavy problem with multiple parts. By making this strategy a classroom routine rather than waiting until students ask for clarification, you can boost student confidence and help all students to internalize this reading strategy.

Intensive Intervention – Paraphrasing for or with students

When your primary goal is to give students **immediate** access to a particular math task, if your students are not ready to handle academic vocabulary in teams, or you have no time for team exploration of new words, you may choose to paraphrase directions or word problems for your students.

Example: The text states, **“Please investigate a new function called a parabola. Spare no detail! I’d like to know everything you can tell me about how the rule for a parabola affects its shape. I need you to uncover the secrets that our competitors do not know.”**

You could say to students, **“Think about parabolas. Tell me how the rule for a parabola creates its shape. Tell me everything you can—especially things other people do not know about parabolas.”**

When your students have some understanding of the problem but are not ready to paraphrase in teams, you may choose to paraphrase part of the problem and ask students to paraphrase the rest.

Example: The text states, **(Same statement as above.)**

You could ask students, **“What is this problem about?”** Then you could ask volunteers to explain challenging phrases such as “spare no detail.” If no one volunteers a correct explanation, you might then say something like, **“‘Spare no detail’ means ‘tell me everything.’ Now that we understand that, what is this problem asking you to do?”**

Moderate Intervention – Students paraphrasing

If your students do not need intensive support, you may decide to read the problem aloud with your class and elicit paraphrasing from volunteers. Make this strategy a routine for complex or text-heavy problems.

Example: The text states, **(Same statement as above.)**

You could ask students, **“What is this problem about? What is it asking you to do?”**

When your students are comfortable with whole-class paraphrasing, you may decide to turn the process over to teams. As students work together, they can paraphrase to help team members access a math task or to demonstrate their understanding to the rest of the team or class. Make this strategy a routine.

Process Word Wall

In addition to new math concepts, students using CPM will encounter new words that describe the common cognitive processes of human inquiry. These process words are fundamental to English fluency and future academic success. These words are sometimes taught out of context. It may be more effective to allow students to develop the meaning of these words throughout the year. One effective strategy to foster this process is to make space on one wall in the classroom for students to post and explain these process words. This “process word wall” is a concrete representation of the growing fluency of the whole class and serves as a visual reference guide. When a student or team discovers a new process word, they make a word tile poster that includes the word, a synonym, a colorful graphic, and one contextual sentence.

Word Choice Stories

Word choice stories, also called Cloze Passages, give students the opportunity to strengthen and verify their understanding of vocabulary words. In this activity, students match vocabulary words with appropriate contexts by filling in blanks with words from a vocabulary list. This strategy is useful in situations in which students already have some familiarity with the vocabulary. Consider this approach to close your focus on a particular group of vocabulary words. A word choice story with five blanks should only take a few minutes to complete and discuss. One example of such a story is included at the end of this document.

- Display an overhead of the story, including blanks and the list of words from which students will choose.
- Direct teams to read the passage and determine from context which word makes most sense in each blank.
- After all teams are finished, read the passage together as a class and ask volunteers to justify each of the correct choices.
- Discuss reasons that some words do not fit into certain blanks, giving students the opportunity to explain their reasoning to each other.

Word Attack

Overview

See the general description and discussion on page 5.

Intensive Intervention – Supported Word Attack

If your students need support using context clues to understand unknown words, you may want to guide them in thinking about possible meanings and choosing strong synonyms. You could begin by asking students to point out unknown words and phrases, and then elicit synonyms that make sense in place of each mentioned phrase. You might then repeat the original sentence several times, each time substituting in one possible synonym. Finally, you ask the class which one makes the most sense in context. If they have trouble identifying the best synonym, guide them in justifying their choices.

Moderate Intervention – Independent Word Attack

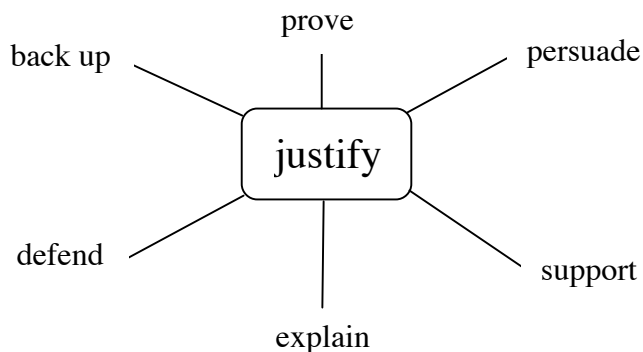
If students need less support with context clues, you may choose to introduce and practice the strategy several times together and then recommend it as a self-help strategy when working in teams.

Word Posters

Word posters can be displayed on classroom walls to remind students of key vocabulary definitions. These can be useful for high frequency math words that will be encountered again and again in the textbook. Useful vocabulary posters must be large, colorful, clear, and concise. Each poster should include the word, a synonym, a sentence using the word, and a visual representation of the word. Posters may also include other forms of the word labeled with parts of speech, i.e., comprehend (v) / comprehension (n) / comprehensive (adj.). Including other forms of the word helps students familiarize themselves with several variations they might encounter later.

Synonym Maps

While working together, students can strengthen team literacy by sketching quick synonym maps for essential new words. To do so, students brainstorm and web all the different ways they can say the new word. Synonym maps may look something like the one below, with the new word in the center and the student-generated synonyms clustered around it. Students should spend no more than a minute or so mapping each word.



Vocabulary Theater

This strategy allows students to connect specific words with their own actions or the actions of classmates, giving them new ways to internalize meaning. This strategy is best used spontaneously with words as they are discovered in the text OR with a group of key words at the end of a chapter or section. The idea is that, after learning the basic definition of a word, volunteers act out the meaning of the word in front of the class.

Version 1:

- The class identifies a challenging word.
- After some brief discussion, a working definition is provided by the teacher.
- A volunteer acts out the meaning of the word.

Version 2:

- The teacher assigns a different word to each study team.
- Teams are given a few minutes to find a definition and plan a performance of their word.
- Volunteers repeat the performance of their word over and over for a full 30 seconds.
- The rest of the class attempts to guess the word being dramatized.

Previewing Homework Vocabulary

If students encounter vocabulary in their homework that is difficult for them, it may intimidate them and/or prevent them from understanding problems. Take two minutes at the end of class to point out new or challenging words students will encounter at home. One simple and time-effective way to preview homework vocabulary is outlined below.

Explain to your students that they will see some words in their homework that may be new or challenging and list the words on the board or overhead. Then, for each word,

- Ask students to indicate their understanding and familiarity using the following signals: Thumb up means, “I know the meaning and I use the word.” Thumb parallel to the floor means, “I’ve heard the word before, but I don’t really know it.” Thumb down means “I’ve never heard the word before.”
- Ask “thumbs up” responders to volunteer to explain the meaning of the word. Elicit responses and then provide one clear, concise definition—preferably only a few words.
- Ask students to look through the homework, find the new word and then paraphrase or restate the portion of the problem containing the word. Or you could ask them what connections they can make between that day’s lesson and the new word.

Learning Log Student Response Template

Learning Log Title: _____ Today is _____

Using guess and check to solve a problem means _____

An example of a problem I can solve with guess and check is _____

The first think I would do to solve this problem is _____

because _____

Then next steps I would use are _____

Here is the complete solution to the example problem. I am showing all of my work so that later I can understand what I did. _____

Guess and Check is helpful to me because _____

Some questions I still have about Guess and Check are: _____

Sample Word Choice Story

Choose the best word from the list below to fill in each blank and complete the story. Be sure to use each word only once.

Jamilla needs money. She has come up with a great _____ to convince her parents to increase her weekly allowance. She has decided to create a graph to _____ an increase of \$5 per week. Her graph is a _____ of the money she plans to spend over the next year. She is careful to make sure that each point on the graph is _____ with something she plans to buy so that her parents clearly understand the _____ of the graph. Let's hope Jamilla's graph is convincing!

Representation
Justify

Strategy
Corresponding

Concept