

# How to Teach Essential Words in Science:

# A Guide for Middle School Teachers

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### **Overview of the Essential Words Routine**

#### A COMMON CHALLENGE

Have you ever noticed that students have difficulty learning new science content because they lack the necessary background knowledge or have limited vocabularies?

#### A RESEARCH-BASED SOLUTION

Preteach students the meanings of important words using a simple graphic organizer and routine!



Why is this practice helpful? Activating students' background knowledge before reading a text or presenting new information greatly increases their comprehension. Teaching essential words prepares students for learning new information by building their background knowledge and providing the "Velcro" for new information to "stick to." This practice also allows teachers to provide

- explicit instruction on important vocabulary words quickly and
- immediate practice using the words through collaborative turn-and-talk activities.

**Does research support the use of this strategy?** YES! Reviews of research on academic vocabulary instruction have found evidence of effectiveness for explicit instruction of important words.

### Teacher Instructions for the Essential Words Routine

#### Step 1: Examine your content and choose your words carefully.

You can preteach essential words either at the beginning of a new unit or before reading a passage. Either way, examine your content and ask yourself the following:

- What is most important for my students to learn?
- What are the main learning objectives for this unit or passage?

Based on your answers, select a few words to preteach.

#### How many words should I introduce at one time?

The following are general guidelines:

- If you are preteaching words for a single reading passage, select two to three words.
- If you are preteaching words for an entire unit (or first half of a unit), select up to five words.

Remember, you know your students best, so adjust instruction accordingly!



#### CHECKLIST FOR SELECTING WORDS

#### Words to Choose

- Essential to understanding the main idea of the text or unit
- Used repeatedly or frequently encountered
- Not part of students' prior knowledge

#### Words NOT to Choose

- Concepts NOT central to the text or unit
- Proper nouns or Latin names
- Specific to a certain situation or topic (e.g., discussed only once in the unit)

## FAQ

# My students won't learn and remember up to five words after just one "dose" of instruction.

You are absolutely correct. This first dose of instruction (with the vocabulary maps) is just the students' introduction to the word—to give them a little background knowledge and prepare them for learning additional content. As you move through your unit or read the text, students encounter these essential words again and again (i.e., multiple exposures), and through your continued instruction students gain a deeper understanding. Some ways to provide additional practice with essential words appear at the end of this guide.

#### Step 2: Create a vocabulary map for each word or concept.

#### (a) Download the Middle School Matters vocabulary map template in PowerPoint:

greatmiddleschools.org/map

The template has preset animations so that content is displayed gradually, allowing students to focus on one vocabulary element at a time. Instructions for finding images to include in the map are also available: greatmiddleschools.org/pictures

#### (b) Using the template, create a vocabulary map for each word you select.



# FAQ

# I don't have time to make all these vocabulary maps. Can I just have my students make them? It seems like it's a good learning activity.

Because the objective is to introduce these essential words before learning content, having students create their own maps is not the best use of instructional time. Also, creating a vocabulary map requires deep understanding of the word, which students are not likely to have yet.

Consider the following tips for creating vocabulary maps:

- Use the premade Middle School Matters template: greatmiddleschools.org/map
- As a department or grade-level team, decide which words need to be taught, divide the vocabulary maps that need to be created, and then share!
- Use the maps from year to year. (Thus, the bulk of the work is done the first year.)

#### Step 3: Deliver instruction using the vocabulary maps.

#### (a) Establish the purpose of the instruction.

Tell students they will learn important words or concepts found in the unit or text.

#### (b) Teach the essential words directly and with a brisk pace (3 to 5 minutes per word).

- Display the vocabulary map in PowerPoint and deliver instruction for one word at a time.
- Students do **not** need a copy of the map and should **not** take notes during instruction.
- Students should track the teacher with their eyes during instruction.
- Students should respond to all teacher prompts and demonstrate understanding of the words during turn-and-talk activities.

#### HOW TO STRUCTURE TURN-AND-TALK ACTIVITIES

1. Provide a prompt for students to discuss. It should be relatable for students so that they can draw on their prior knowledge or life experience.

Example: What kind of information do you analyze before buying a new electronic device?

2. Have students turn to their partner and discuss the prompt (10 to 20 seconds). Monitor students' conversations to check for understanding.



- 3. Select students to share thoughts and ideas from their discussion with the whole group (30 seconds).
- 4. Repeat steps 1 to 3 with a second prompt that sparks discussion related to your course content. Example: Why is it important to analyze the data you've collected during a lab session?



### FAQ

#### There is no way I can get through each word in only 3 to 5 minutes!

Perhaps not the first time, but after a little practice, you'd be surprised how quickly you can present an entire vocabulary map. It's OK to try this strategy with just one word on the first day or two. Time yourself (or record yourself on your smart phone) to see how long it takes and then make adjustments for future instruction.

#### My students will get off track during the turn-and talk activities and talk about other things.

Keep students on track by (a) setting clear expectations ahead of time (you will call on a group to report out after partners discuss) and (b) giving them only 15 to 30 seconds to discuss. Rotating around the room as partners talk also helps to keep students on task and allows you to check for understanding.

### **Creating Additional Opportunities to Practice Essential Words**

A critical next step is to return to these words regularly throughout the lesson and instructional unit to ensure that students have a deep understanding of the words and can correctly use them in speaking and writing tasks.

The following activities provide interactive language opportunities focused on the target word.

#### **Example or Nonexample Questions**

Students listen to sentences and determine whether they are examples or nonexamples of the target word. The teacher displays the prompts and reads them aloud to students; students respond orally.

#### **Examples or Nonexamples?**

#### Target word: interact

- 1. Tony did not even notice Josie sitting next to him in the gym. Did they interact?
- 2. Not a leaf was moving because the wind was completely still. Was there an interaction?
- 3. The teacher poured vinegar into the jar of baking soda, and it bubbled and fizzed. Was there an interaction?

#### **Sentence-Creation Prompts**

Students demonstrate their understanding by creating their own sentence using the target word.

#### **Prompt and Possible Responses**



**Teacher:** We have learned the word **analyze**. Now I'd like you to turn to your partner and use the word in a sentence. You will have 30 seconds, and then I'll call on you to share with the class.

#### Students:

- I had to analyze the facts for my science project.
- We had to analyze the data from our experiment to know whether it came out right.
- The teacher asked us to analyze the facts to understand why the environment is changing.

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#### **Frayer Model**

This graphic organizer builds vocabulary and conceptual knowledge across content areas. The strategy requires **students** (not the teacher) to define a vocabulary word and then process the word by outlining its characteristics, examples, and nonexamples. This activity can be done in collaborative groups while the teacher circulates around the classroom and assists students.



#### MULTIPLE MEANINGS OF WORDS

Don't forget that students should be taught the multiple meanings of words in addition to what words mean in a specific context. This is especially important for English learners, who tend to know fewer words and fewer definitions for multiple-meaning words than native English speakers.

#### **Essential Words Routine: Key Takeaways**

- Carefully select the **most important** words to preteach to students.
- Create a vocabulary map for each word that includes a student-friendly definition, synonyms, a visual, examples, and turn-and-talk prompts.
- Deliver instruction for 3 to 5 minutes per word using the maps you created.
- Do **not** allow students to create their own vocabulary maps.
- Revisit these essential words multiple times during your unit.



#### **Helpful Resources**

The following are available at <u>GreatMiddleSchools.org/words</u>

- Professional development resources
- Strategy guides
- Vocabulary map template
- Videos

#### **Questions?**

E-mail us at msmi-info@meadowscenter.org

## Selected References

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This practice is also included in *The Middle School Matters Field Guide: Reading Throughout the Content Areas* (see Principle 3, Practice 1).