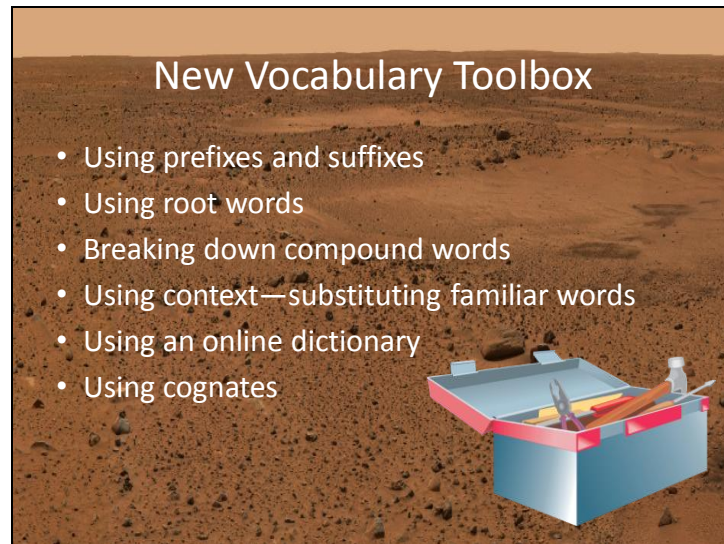


As you conduct your research today, you are likely to encounter many new vocabulary words. Since the research you are conducting will help you create a successful Mars Rover mission, it is very important for you to have a complete understanding of the articles you read so you can incorporate (or include) what you read into the spacecraft and rovers you design. Understanding the new vocabulary is key for you to comprehend the articles on spacecraft and space travel.

Today's mini-lesson will give you some ideas and tools you can use to figure out the meanings of the new words in the articles.



As you conduct your research today, you will undoubtedly come across many words you have never seen before. Some of this new vocabulary may be very important in helping you design your spacecraft. So, it is important to have a toolbox of different strategies you can use to figure out the meaning of new words.

This slide shows you a list of strategies you can use to figure out the meaning of new vocabulary. These will become your “Vocabulary Toolbox”. Let’s now learn about these tools one at a time.



In some cases, prefixes and suffixes can help you find the meaning of new words. Let's take a look at one of the words found in the articles you'll be reading today. This word is probably new to you. Let's look at the this word more closely to see if we can figure out its meaning using prefixes and suffixes.

Let me start with a question—does anyone see a familiar word within the word on the screen? (Ask for a volunteer.) Yes, that's right, we can see the word circle.

Using Prefixes and Suffixes

- Look for prefixes and suffixes in novel words. They often provide clues as to meaning.

encircled

↑ make into ↑ in the past

This slide has 2 (two) CLICKS of animation.

So the meaning of this word will relate to circle. Now, let's look at the prefix "en". En is a prefix that changes a noun like circle into a verb. It means to "make into". Then, the suffix "ed" means "in the past", so encircled would mean something like "make into or in a circle in the past". This is very close to the real definition of encircle, which means to "make or draw a circle around something".

Let's look at some other common prefixes and suffixes that you may encounter in your reading today.



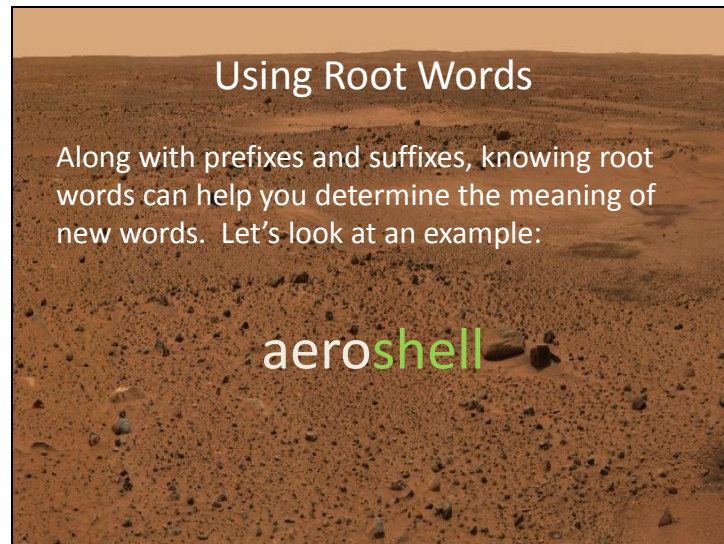
Here is a list of prefixes. You will see these prefixes as you do your research today. When you come to a word you do not know, check to see if it contains one of these prefixes. It could help you determine the meaning of the word, just like we did with encircled on the previous slide.

OPTIONAL—Pass out the common prefix sheet for students to refer to during the reading.



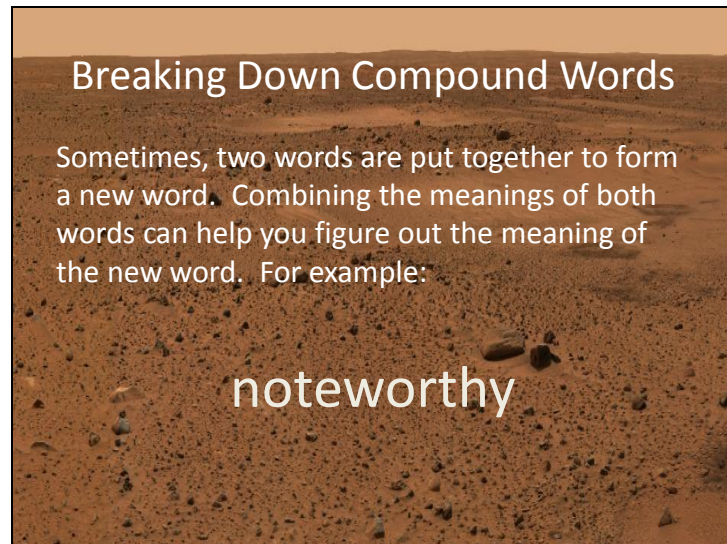
Suffixes can also help you figure out the meanings of new words. This slide shows some of the suffixes you will come across during your readings today.

OPTIONAL—Pass out the common prefix sheet.



Aeroshell is a word you will encounter in today's readings. We can use the word root and the prefix to determine what this word means. As you know, a shell is the outside part of the egg. You also probably know that that shell protects the egg (and the baby animal that grows inside). Other things have shells as well, such as peanuts and even cars. In all these cases, the shell is the outside part that protects what is inside. You also learned earlier that the prefix "aero" refers to air or aircraft. So, if we put the two parts of this word together, we might guess that an aeroshell would protect something while it is in the air. And that is very close to the real definition.

NASA uses aeroshells to protect instruments that they are sending to another planet. The aeroshell keeps the instrument safe while it falls to the surface of the planet, protecting it from heat, radiation and dust. Just like a real egg, once the shell breaks open once it hits the planet's surface and the NASA instrument can then do its work.

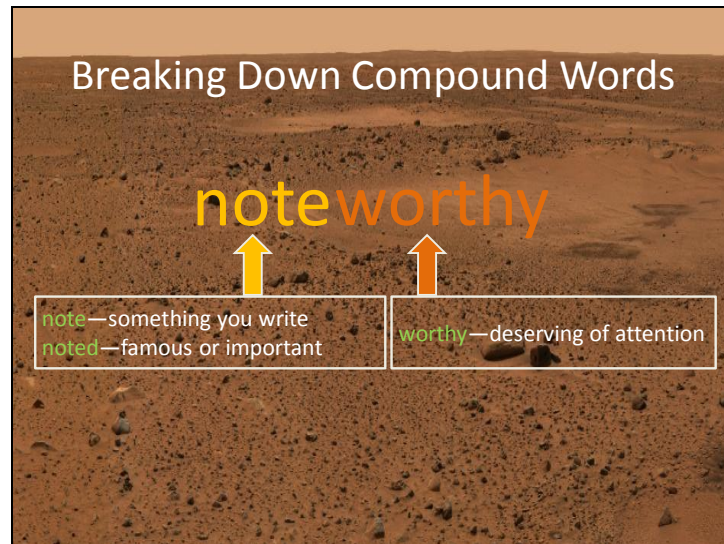


Breaking Down Compound Words

Sometimes, two words are put together to form a new word. Combining the meanings of both words can help you figure out the meaning of the new word. For example:

noteworthy

Paraphrase the information on this slide.




This slide has 1 CLICK of animation.

Let's break this word into its two parts. CLICK.

The first word is note. A “note” can be something you write and “noted” means famous or important. “Worthy” means deserving of attention.

So when we put the two meanings together, we get “something famous or important that is deserving of attention” and “something you write about because it is deserving of attention”. Both of those would be good definitions for the entire word, “noteworthy”.

So breaking down a compound word can help us figure out the meaning.



Using context:
substituting familiar words

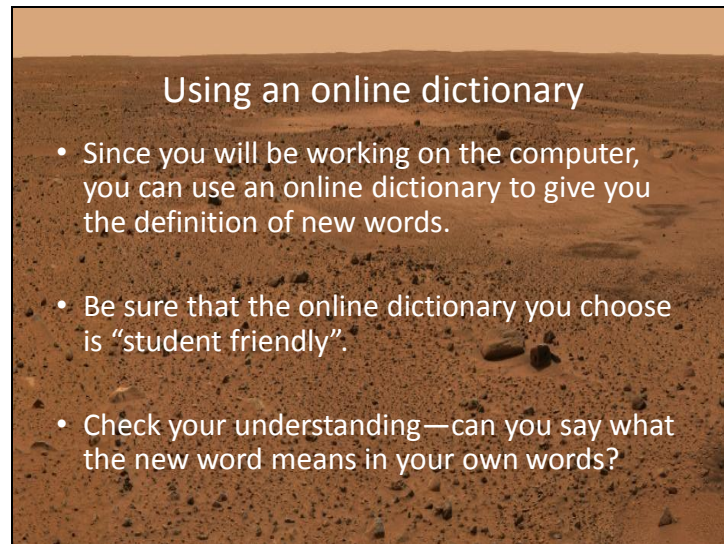
Sometimes, the rest of the sentence gives us clues about the meaning of a new word. Let me do a think-aloud with you using the following example:

Planetary spacecraft have usually been fairly delicate-looking contraptions.

Paraphrase the first paragraph and read the example. Then walk students through the example.

Hmmm. “Contraption” is a new word for me. Let me see if I can figure out the meaning from the rest of the sentence. The sentence basically says that spacecraft are delicate-looking SOMETHINGS. Well, I know that spacecraft are machines. I wonder if contraption might be another word for machine.

Now that I have a good guess as to what the word may mean, let me try to substitute the word I came up with in place of “contraption” to see if it makes sense. “Planetary spacecraft have usually been fairly delicate-looking **machines**.” Yes, that makes good sense. Indeed, a contraption is a machine, although when the word is used, people think about “funny-looking machines” or “machines that look like they may not work well”. So our guess was good enough to get us close to the real definition.



Another useful tool for new vocabulary is a dictionary. You can use a printed dictionary or you can use an online dictionary. However, since most of your reading today will be on the computer, let's focus on dictionaries you can find on the internet.

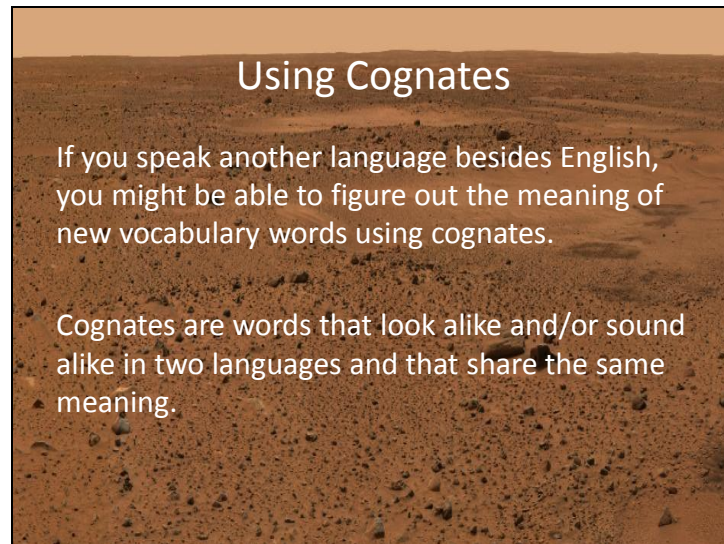
However, be sure that you pick a dictionary that is student-friendly. Student-friendly means that the definitions of the new vocabulary are written in words that students your age can understand. Some dictionaries are written for grown-ups and the definitions often contain words that might be just as hard for you as the word you didn't understand. You won't understand the word any better if you don't understand the definition.

You might be wondering, "How can I know that I really understand what the new word means?" One way to check your understanding is to see whether you can state the definition in your own words, rather than just repeating what you read. When you understand or "own" a word, you can tell other people what it means.

(Teachers, below are links to two online dictionaries. You may wish to bookmark these [or other similar student-friendly dictionaries] on the computers your students will use and show them how to use them.)

<http://www.nasa.gov/audience/forstudents/k-4/dictionary/index.html>

<http://www.ldoceonline.com/>



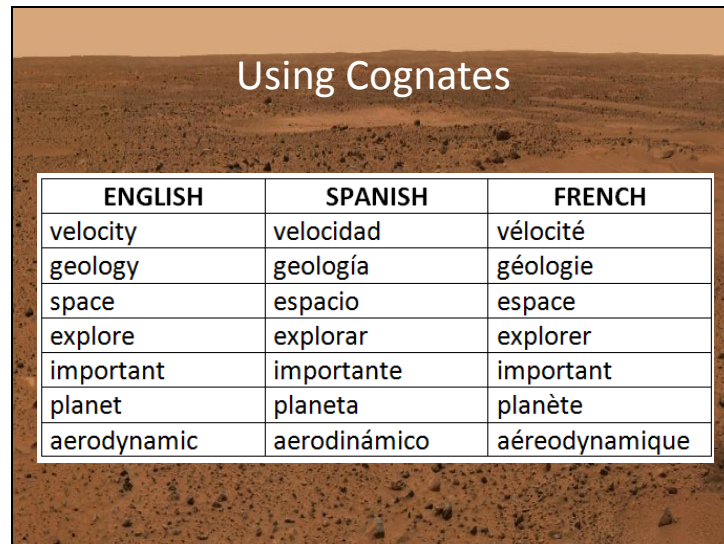
Using Cognates

If you speak another language besides English, you might be able to figure out the meaning of new vocabulary words using cognates.

Cognates are words that look alike and/or sound alike in two languages and that share the same meaning.

Paraphrase the information on this slide.

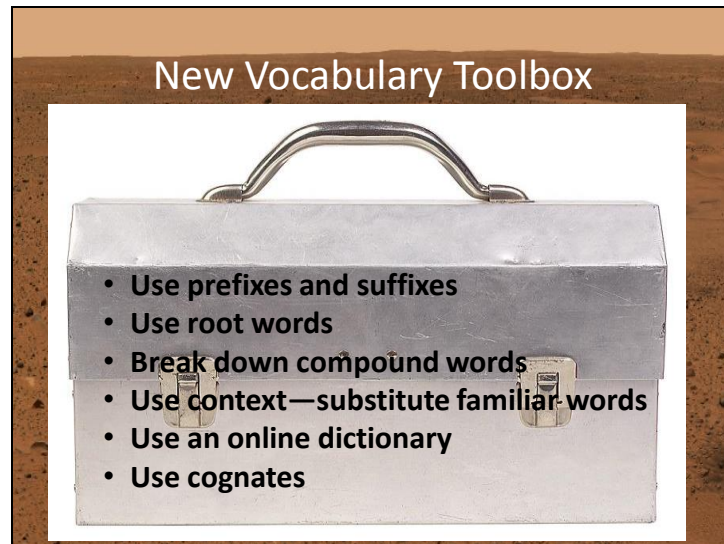
Depending on how similar the language you speak is to English, there may be many or just a few cognates. If you speak Spanish or French, there are tens of thousands of words that these languages share with English. Let's look at some examples.



Using Cognates

ENGLISH	SPANISH	FRENCH
velocity	velocidad	vélocité
geology	geología	géologie
space	espacio	espace
explore	explorar	explorer
important	importante	important
planet	planeta	planète
aerodynamic	aerodinámico	aérodynamique

(If your students do not have speakers of other languages, you can skip this slide. If your students speak Spanish or French, let them point out the similarities between the words and suggest other examples. If they speak other languages, point out the similarities and ask them to think about and suggest other words that are similar in their language and English. If your students have a hard time identifying an example in their language, suggest the word telephone, which has a cognate in most languages.)



Let's review our new vocabulary strategies (go over list on toolbox). I will give each of you a worksheet with a copy of this toolbox. You can use it as a reminder of the different "tools" available to you to figure out the new vocabulary words you will encounter as you conduct your research today.