

## Analogies: Critical Thinking Across Content Areas from *Ridgewood Analogies*

Analogous thinking is already a part of many classrooms.

The processes involved in solving analogies in the content areas empower students. Thinking analogically requires learners to:

- ◆ actively process information
- ◆ make important connections
- ◆ use information and skills to identify relationships
- ◆ construct relationships and generate new knowledge
- ◆ improve understanding and long-term memory

The following discussion provides the background that will help you teach students to recognize and solve analogies.

### WHAT IS AN ANALOGY?

An analogy is made from sets of words or concepts that have a particular relationship. Analogy problems often show pairs of words. The relationship between the first pair of words is the same as the relationship between the second pair. Here is an analogy:

**bat : baseball :: racket : tennis ball**

We read this as *Bat* is to *baseball* as *racket* is to *tennis ball*. This means that the relationship between *bat* and *baseball* is like the relationship between *racket* and *tennis ball*. You can explain the similarity through a *relationship sentence*:

**A bat is used to hit a baseball, just as a racket is used to hit a tennis ball.**

The phrase is *used to hit* a is called the *relationship phrase*.

**eyes : seeing :: ears : \_\_\_\_\_**

We read this as *Eyes* are *seeing* as *ears* are to \_\_\_\_\_. The relationship phrase is *are used for*. The relationship sentence is:

**Eyes are used for seeing, just as ears are used for hearing.**

### HOW CAN STUDENTS USE ANALOGIES?

Analogies stimulate critical and creative thinking and can be used in all content and skill areas. They can teach and reinforce content, as well as assess students' abilities to identify relationships and make connections.

#### *Language Arts*

In language arts, a lesson might be presented in this way:

**view : preview :: \_\_\_\_\_ : reread**

Students must first recognize that *view* is the root word of *preview*. In the next step, they must express that fact using a relationship phrase: **View is the root word of preview**. Then students must complete the analogy, using the same relationship phrase: **Read is the root word of reread**. The completed analogy looks like this:

**view : preview :: read : reread**

#### *History*

History is another area in which analogies can be used effectively. Assessment in this area can be achieved by using analogies in the following way:

**Thomas Jefferson : Declaration of Independence :: \_\_\_\_\_ : Constitution**

Students must recognize Thomas Jefferson as the main writer of the Declaration of Independence. The first part of the analogy reads **Thomas Jefferson was the main writer of the Declaration of Independence**. To complete the analogy, students must identify James Madison as the main writer of the Constitution. The completed analogy looks like this:

**Thomas Jefferson : Declaration of Independence :: James Madison : Constitution**

## Math

In **math**, analogies can be verbal, numeric, or symbolic. Here is a **verbal** analogy:

subtraction : addition :: \_\_\_\_\_ : multiplication

The relationship phrase is *is the inverse operation of*: **Subtraction is the inverse operation of addition**. The completed analogy reads:

subtraction : addition :: division : multiplication

A **numeric** phrase looks like this:

$15 \times 2 : (10 \times 2) + (5 \times 2) :: 14 \times 3 : \underline{\hspace{2cm}}$

The relationship phrase is *can be rewritten as*:  $15 \times 2$  can be rewritten as  $(10 \times 2) + (5 \times 2)$ . The completed analogy looks like this:

$15 \times 2 : (10 \times 2) + (5 \times 2) :: 14 \times 3 : (10 \times 3) + (4 \times 3)$

Symbolic analogies (those that use symbols) are also possible)

☺ : ☹ :: ☺ : \_\_\_\_\_

The relationship phrase is *can be rotated to form*: ☺ can be rotated to form ☹. The completed analogy looks like this:

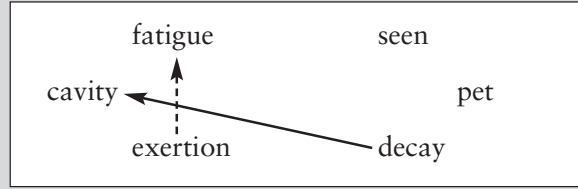
☺ : ☹ :: ☺ : ☺

## THE DIFFERENT TYPES OF ANALOGIES

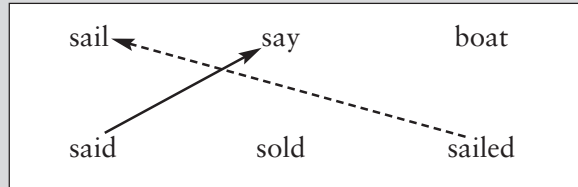
### Causal Analogies

A **causal** analogy shows a relationship between two pairs of words. In one kind of causal analogy, one word shows a cause and the other word shows the effect of that cause. In the second kind of causal analogy, the second word in each pair shows the result of a change made to the first word. Such a change may be, for example, a mathematical operation, or a change in a word's tense or part of speech.

For example, *Decay* is to *cavity* as *exertion* is to *fatigue* is an example of the first kind of causal analogy because *decay* causes a *cavity* and *exertion* causes *fatigue*. *Said* is to *say* as *sailed* is to *sail* is an example of the second kind of causal analogy because the second word in each pair shows the result of changing the first word to the present tense.



The relationship phrase is: *causes*. **Decay causes a cavity**, just as **exertion causes fatigue**.

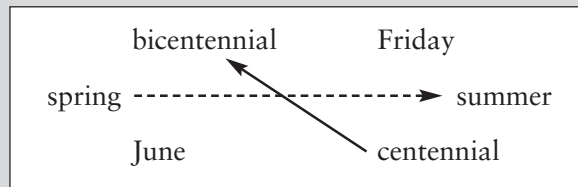


The relationship phrase is: *is the past tense of*. **Said is the past tense of say**, just as **sailed is the past tense of sail**.

### Serial Analogies

A **serial** analogy shows a relationship between two pairs of words. In each pair, one word relates to the other in time, size, sequence, quantity, or intensity.

For example, *Centennial* is to *bicentennial* as *spring* is to *summer* is a serial analogy because *centennial* comes before a *bicentennial* and *spring* comes before *summer*.

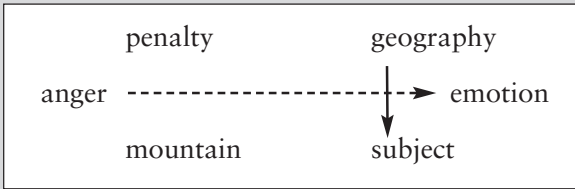


The relationship phrase is: *comes before*. **Centennial comes before bicentennial**, just as **spring comes before summer**.

### Categorical Analogies

A **categorical** analogy shows a relationship between two pairs of words. In each pair, one word names a category and the other names an example from that category.

For example, *Geography* is to *subject* as *anger* is to *emotion* is a categorical analogy because *geography* is an example of a *subject*, just as *anger* is an example of an *emotion*.

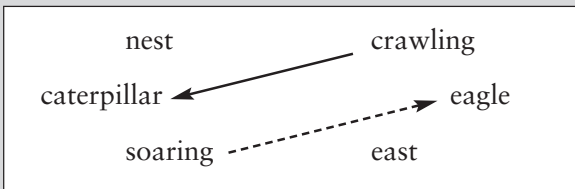


The relationship phrase is: *is an example of*. **Geography** is an example of a **subject**, just as **anger** is an example of an **emotion**.

### **Descriptive Analogies**

A **descriptive** analogy shows a relationship between two pairs of words. In each pair, one word describes a characteristic, property, part, function, structure, use, position, or location of the other.

For example, *Crawling* is to *caterpillar* as *soaring* is to *eagle* is a descriptive analogy because *crawling* is the movement of a *caterpillar*, just as *soaring* is the movement of an *eagle*.

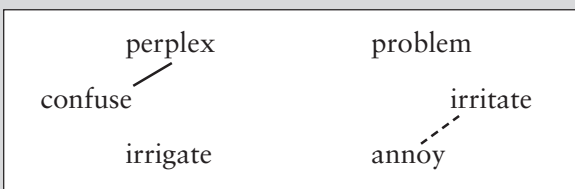


The relationship phrase is: *is the movement of*. **Crawling** is the movement of a **caterpillar**, just as **soaring** is the movement of an **eagle**.

### **Comparative Analogies**

A **comparative** analogy shows a relationship between two pairs of words. The words in each pair are synonyms, antonyms, homonyms, or anagrams (two words that contain the same letters arranged in different ways, like *silo* and *oils*).

For example, *Perplex* is to *confuse* as *irritate* is to *annoy* is a comparative analogy because *perplex* and *confuse* are synonyms. They have the same meaning but are spelled differently; *irritate* and *annoy* also are synonyms.



The relationship phrase is: *is a synonym for*. **Perplex** is a synonym for **confuse**, just as **irritate** is a synonym for **annoy**.

Notice that terms in a comparative analogy are connected with lines, not arrows. Arrows indicate the order in which the words in each pair must appear. In comparative analogies, the order of the words does not matter. This is because most comparative analogies deal with synonyms, antonyms, homonyms, or anagrams. The relationship sentence for a comparative analogy is true even when you switch the order of the words in each pair. It is true to say that *perplex* is a synonym for *confuse*, but it is also true to say that *confuse* is a synonym for *perplex*.

Familiarity with analogies and critical thinking techniques can help to increase student achievement on standardized tests. Studying and understanding analogies also helps develop critical thinking skills, an essential concept for all students.

*Ridgewood Analogies Book 5 – Teacher’s Guide*, available from Educators Publishing Service.