HOW TO PREPARE FOR THE

MILLER ANALOGIES TEST

by Morris Bramson

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Scoring High on the Miller Analogies Test

Scoring High on the MAT

The analogy is a popular form of test question in many types of examinations. It is used in one form or another in the Scholastic Aptitude Test, the Graduate Record Examination, and the Graduate Management Admission Test, among others.

In these tests, the analogies are essentially verbal: that is, the analogies are primarily based on vocabulary. The Miller Analogies Test includes analogies that are based on subject matter as well as verbal relationships. The subject matter may be in the fields of science, social science, mathematics, philosophy, art, music, etc

The various types of analogies used in the MAT are described in this chapter. Familiarize yourself with these different types and the approaches to them before proceeding to the nine sample tests

The MAT consists of one hundred analogies to be answered in fifty minutes Avoid spending too much time on any one question. Credit is granted only for correctly answered questions, but there is no penalty for an incorrect answer Therefore, if you are not certain of the answer to any question after considering it for a while, take as good a guess as possible Make sure that you have answered *all* questions by the end of the test

The scores that are reported to colleges and institutions are raw scores, simply the number of questions answered correctly. Most graduate schools consider these scores along with other aspects of the applicant's ability: his undergraduate grades, faculty recommendations, etc

The sample tests are similar in form and content to the actual Miller Analogies Test. As you finish each test, check your answers with those in the answer key. For those questions you answered incorrectly, look over the explanatory answers that follow each test and answer key

We believe that going through these tests in the manner described will help you become familiar with the analogy concept and can help you toward continuous improvement of your MAT score.

Approaches to Solving the MAT Analogy Problem

THE MAT ANALOGY PROBLEM . . . WHAT IT IS

The MAT analogy is a word relationship problem that consists of four terms: three given terms, and a fourth, open term

SOFT : HARD :: PILLOW : ( )
1 2 3 4

Four choices are offered in the space of the open term. As presented on the MAT, the problem looks like this

SOFT : HARD · · PILLOW : (*a.* bed *b.* cot *c.* pea *d.* rock)

Your task is to discern the relationship between Term 1 and Term 2, or between Term 1 and Term 3, and then to select the correct term from among the four choices made available in the open term which lies within the parentheses

The correct choice for the open term is the one which permits you to make *similar*, or *analogous*, statements about each of the two pairs of terms in the problem. In the sample problem above, the problem can be solved by establishing a relationship between Term 1 and Term 2, or by establishing a relationship between Term 1 and Term 3, as follows.

1 SOFT is an antonym of HARD. Similarly, to the degree in which they both yield to the touch, PILLOW is an antonym of ROCK

2. SOFT is an adjective that describes a fundamental quality of a PILLOW. An analogous statement using Terms 2 and 4 would be. HARD is an adjective that describes a fundamental quality of a ROCK

Answer *(d)*

NOTE: **In the MAT analogy problem, you can establish a relationship between any two of the given terms—*other than Terms 1 and 4 or Terms 2 and 3.* The correct choice for the open term is the one which, taken with the remaining given term, gives you a relationship that is analogous to the relationship already established.**

Here is another sample analogy problem

HOT · COLD : . WARMS : (*a.* chills *b.* kills *c.* bites *d.* wets)

You probably noted by inspection that you could express a relationship between Term 1 and Term 2. You may also have noted that you could express a relationship between Term 1 and Term 3. As in the previous sample, you could have begun with either pair of terms, as follows:

1. If HOT is the opposite of COLD, you must select the word from among the four choices offered in the open term which, taken with WARMS, gives you a relationship that is similar to the one between HOT and COLD. Since HOT and COLD are opposites, you must select a word that is the opposite of WARMS. That word is CHILLS.

2. Starting with Terms 1 and 3, you might have said: a HOT drink WARMS us. In this relationship, the physical quality of Term 1 tells us, through Term 3, what its effect is. Therefore, you must select the word from among the four choices in the open term which, taken with COLD, tells you what COLD does. A COLD drink CHILLS us, is the analogous statement.

Answer (*a*)

NOTE: Although the signs between the terms in the MAT analogy problem are the same as those used to express mathematical ratios, do not think of the verbal MAT analogies in mathematical terms, and *do not say*, "Term 1 is to Term 2 as Term 3 is to Term 4," but rather, make a meaningful statement, using each pair of terms, so that a significant relationship is expressed.

It is not helpful to say: HOT is to COLD as WARMS is to what?

It is helpful, however, to make a statement like: HOT is the opposite of COLD. Then you can ask yourself which choice will permit you to use the remaining given term, WARMS, in an analogous statement.

THE MAT ANALOGY PROBLEM . . . WHAT IT LOOKS LIKE

In the samples given so far, the open term of the MAT analogy problem has been the fourth term. However, the open term need not appear as Term 4; it can appear as any of the four terms, as for instance:

ROAD : ASPHALT : : BOOK : (*a.* glass *b.* paper *c.* straw *d.* tin)

ROAD : ASPHALT : : (*a.* hut *b.* bed *c.* book *d.* top) : PAPER

ROAD : (*a.* tin *b.* mud *c.* asphalt *d.* flat) : : BOOK : PAPER

(*a.* bed *b.* road *c.* car *d.* bitumen) : ASPHALT : : BOOK : PAPER

No matter where the open term appears, the analogy problem remains the same, and if the terms remain constant in each instance, the solution must remain the same. In other words, if the relationship between Term 1 and Term 2 is one in which the former is made of the latter (as in the case above), then the relationship between Term 3 and Term 4 must be one in which Term 3 is made of Term 4. Similarly, if the relationship established is between Term 1 and Term 3, you must establish an analogous relationship between Term 2 and Term 4.

In the four different forms of the analogy problem given above, the same explanation of the relationships between the terms obtains:

> A material used in building a ROAD is ASPHALT, just as a material used in making a BOOK is PAPER.

These statements and the relationships they express remain the same for each of the forms, but the choice of answer for each is, of course, different. Thus, in the first form, the answer is *b. paper.* In the second, the answer is *c. book.* In the third and fourth, the answers are, respectively, *c. asphalt,* and *b. road.*

THE MAT ANALOGY PROBLEM . . . GETTING THE RIGHT ANSWER

The basic strategy for solving the MAT analogy problem has already been demonstrated, but it bears repetition:

Use the appropriate pair of given terms in a statement that expresses a significant relationship between them. Then, use the remaining given term and the open term choice that permits you to make a second statement that expresses a relationship that is parallel, or analogous, to the first one. Do not express the relationships in the analogy problems in the mathematical terms of a ratio problem. So, use the pairs of terms in meaningful statements.

When you use any pair of terms in a statement, be sure to keep the terms in the order in which they appear in the problem, as in the sample below:

DAWN : DAY : : DUSK : (*a.* noon *b.* morn *c.* night *d.* twilight)

In this example, the relationship between DAWN and DAY is a sequential one: DAWN is followed by DAY. If the relationship between the two terms of the second pair is to parallel that of the first pair, the question you must ask yourself is, "What is DUSK followed by?" However, if you have not habituated yourself to using the terms in the order in which they appear in the problem, you might have found yourself saying, "DAY follows DAWN, and DUSK follows NOON." The answer, of course, is that DUSK is followed by NIGHT.

Answer (*c*)

REMEMBER! When you make your statement about each pair of terms, use the terms in your statement in the order in which they appear in the problem.

Sometimes you must establish a relationship between the first term and second term, and sometimes between the first and third terms. How can you tell which pair to start with? One way to determine which pair of given terms to use is by inspection and trial. Very often the parts of speech of the given terms will provide an important clue·

PITCHER : THROWS : : BATTER : (*a.* catches
b. slides *c.* hits *d.* wins)

You can see, almost at a glance, that the first two terms, a noun and a verb, combine readily in the construction of a statement that expresses a significant relationship between them. It is equally clear that the third term is a noun, and that the four choices in the open term are verbs

Having established by inspection the possibility of a relationship between Terms 1 and 2, you would now make a trial statement using the two words "A PITCHER THROWS a ball." Now you would attempt to construct an analogous statement using the third term and one of the choices in the open term. If a PITCHER THROWS a ball, what does a BATTER do that is parallel? He may; of course, do any of the things offered as choices, but the verb THROWS defines the PITCHER'S primary function, and the only way to construct an analogous statement is by selecting the verb that defines the BATTER'S primary function, and that verb is HITS.

If the terms were shuffled around—

PITCHER : BATTER : : THROWS : (*a.* catches
b. slides *c.* hits *d.* wins)

you would probably still see the first noun as relating to the first verb. You would still say, "Just as a PITCHER THROWS a ball as his primary function, so, too, a BATTER HITS a ball as *his* primary function.

A further aid to determine which pair of terms to use for making your initial statement is dependent upon your ability to classify analogy relationships by category The next section of this book sets forth various categories into which analogies fall.

Types of MAT Analogies

The MAT analogy problems can be classified in two ways:

1. The content areas from which the material for the problems is drawn;

2. The categories into which the problems' relationships fall, by type.

THE MAT ANALOGY PROBLEM ... THE NATURE OF THE CONTENT QUESTIONS

The material for the analogy problems is drawn from a broad spectrum of subject areas. The test constructors assume that the candidate's educational background, personal reading, and cultural environment have prepared him or her for solving analogy problems drawn from the fields of mathematics, science, literature, history, art, music, religion, mythology, philosophy, the social sciences, and from general information sources. Analogies are also based on vocabulary alone. Examples of analogies from each of these areas are given below, with explanatory solutions:

GENERAL INFORMATION

AURORA AUSTRALIS : SCOTT : : AURORA BOREALIS : (*a.* Peary *b.* Mason *c.* Livingston *d.* Clark).

The AURORA AUSTRALIS is the south polar equivalent of the AURORA BOREALIS, or northern lights, of the north polar region. SCOTT was an antarctic explorer; Peary was an arctic explorer. It is likely, therefore, that the AURORA AUSTRALIS was seen by SCOTT, and that, similarly, the AURORA BOREALIS was seen by PEARY.

Answer (*a*)

CHRISTIE : SKIING : : HOOK SLIDE : (*a.* golf *b.* fishing *c.* soccer *d.* baseball).

A CHRISTIE is one of several types of turns in SKIING, and a HOOK SLIDE is a technique for sliding into a base in BASEBALL. Therefore, we can say that the statement, "A CHRISTIE is a specialized maneuver in

SKIING" is analogous to the statement, "A HOOK SLIDE is a specialized maneuver in BASEBALL."

Answer (*d*)

VOCABULARY

SOMBER : (*a.* sleepy *b.* grave *c.* tired *d.* alert) : :
VIVACIOUS : ANIMATED

VIVACIOUS and ANIMATED are synonyms. Both mean very lively Similarly, SOMBER and GRAVE are synonymous. Both mean very serious.

Answer (*b*)

NOTE: In the problem above, the initial statement uses Term 3 and Term 4, since the open term is Term 2. Terms 1 and 3 could be used, but then they would have to be presented as having an antonymous, or opposite, relationship.

Using different combinations of given terms to establish relationships through the initial statement is not always possible, as we shall see in the next sample:

EXTENSION : RETRACTION : : NEMESIS :
(*a. hoodoo b. foe c. benefactor d. detractor*).

EXTENSION is an antonym of RETRACTION. NEMESIS, which means an agent of punishment or retribution, is the opposite of BENEFACTOR.

Answer (*c*)

WORD STRUCTURE

DISCREET : DISCRETE : . (*a.* fit *b.* event *c.* meat *d.* meet) : METE

DISCREET and DISCRETE are homophones, as are MEET and METE. Note that *meat* is a homophone of METE, too, but it does not match the spelling of DISCREET as MEET does.

Answer (*d*)

PTARMIGAN : GNAT : : (*a.* pheasant *b.* rood *c.* earth *d.* column) : APLOMB

PTARMIGAN, like GNAT, has a silent initial letter. COLUMN, like APLOMB, has a silent final letter

Answer (*d*)

MATHEMATICS

2 : 3 : : 5 : (*a.* 4 *b.* 7 *c.* 8 *d.* 11)

2 is a prime number, and 3 is the next highest prime number. Similarly, 5 is a prime number, and 7 is the next highest prime number.

Answer (*b*)

4 : 6 : : 6 : (*a.* 4 *b.* 7 *c.* 9 *d.* 10)

Even in this simple mathematical ratio problem it is safer to avoid saying 4 is to 6. Far better, say that *4* is two-thirds of *6*, just as *6* is two-thirds of *9*.

Answer (*c*)

SCIENCE (BIOLOGY, PHYSICS, CHEMISTRY, ASTRONOMY, ETC.)

LIVER : DUCTS : : (*a.* pancreas *b.* sweat *c.* pituitary *d.* kidney) : DUCTLESS

The LIVER is a gland with DUCTS. The PITUITARY is a DUCTLESS gland.

Answer (*c*)

MERCURY : SMALLEST : : (*a.* Earth *b.* Jupiter *c.* Saturn *d.* Pluto) : LARGEST

MERCURY can be described as the SMALLEST planet in the solar system. An analogous statement would be that JUPITER can be described as the LARGEST in the system.

Answer (*b*)

LITERATURE

(*a.* Pope *b.* Rossetti *c.* Browning *d.* Hardy) : PRE-RAPHAELITE : : KEATS : ROMANTIC

ROSSETTI was one of the PRE-RAPHAELITE poets. An analogous statement would be that KEATS was one of the ROMANTIC poets.

Answer (*b*)

MILTON : AREOPAGITICA : : BACON :
(*a.* Novum Organum *b.* Utopia *c.* Le Morte d'Arthur *d.* Paradise Lost)

John MILTON was the author of AREOPAGITICA. Francis BACON was the author of the NOVUM ORGANUM.

Answer (*a*)

SOCIAL SCIENCES

COMING OF AGE IN SAMOA : (*a* Malinowski *b.* Mead *c.* Boas *d.* Benedict) : · PSYCHOPATHOLOGY OF EVERYDAY LIFE : FREUD

COMING OF AGE IN SAMOA was written by MEAD, just as PSYCHOPATHOLOGY OF EVERYDAY LIFE was written by FREUD.

Answer (*b*)

STAGES OF MAN · CHILD DEVELOPMENT · : ERIKSON : (*a.* Horney *b.* Jung *c.* Piaget *d.* May)

The STAGES OF MAN is a concept of levels of development of human beings, and it is associated with ERIKSON. CHILD DEVELOPMENT, conceptualized as having levels, is associated with PIAGET.

Answer (*c*)

HISTORY

1066 : (*a.* Eric the Red *b.* William of Orange *c.* William the Conqueror *d.* Richard the Lionhearted) : : 1588 : SPANISH ARMADA

1066 is the date of the Norman conquest of England by WILLIAM THE CONQUEROR. An analogous statement is that *1588* is the date of the attempted conquest of England by the SPANISH ARMADA.

Answer (*c*)

LOUIS XVI : ROBESPIERRE : : MONARCHY : (*a.* Directory *b.* Consulate *c.* Committee of Public Safety *d.* Ancien Regime)

LOUIS XVI was ruler of France under the MONARCHY. ROBESPIERRE was a leader of France while the COMMITTEE OF PUBLIC SAFETY held sway.

Answer (*c*)

ART, MUSIC, RELIGION, MYTHOLOGY, PHILOSOPHY, ETC.

(*a.* Michelangelo *b.* da Vinci *c.* Giacometti *d.* Epstein) :
PIETA : : BEETHOVEN : EMPEROR CONCERTO

The sculptor MICHELANGELO created the PIETA. BEETHOVEN created the EMPEROR CONCERTO, his fifth piano concerto.

Answer (*a*)

NOTE: As is demonstrated in the sample analogy problem above, both pairs of related terms need not derive from the same subject area. However, the type of relationship must be the same for both related pairs.

THE MAT ANALOGY PROBLEM ... THE CATEGORIES OF RELATIONSHIP IN THE MAT ANALOGY PROBLEM

The most important concept to keep in mind while attempting to solve the MAT analogy problem is that the four terms of the problem must be divided into two pairs that are related to each other in the same way; for this, by definition, is the nature of the MAT analogy problem. An analogy is, according to the *Random House Dictionary*, "a partial similarity between like features of two things, on which a comparison may be based."

It is most helpful to understand, too, that, by and large, the number of ways in which people, objects, characteristics, and actions can relate to each other is not unlimited. In fact, although the types of relationships between the terms of an analogy cannot be keyed down to a precise number, they can be categorized enough to permit you to recognize most types of relationships quickly.

Listed below are a number of fairly common, very useful relationship categories, with samples and explanatory answers for each:

SYNONYMOUS RELATIONSHIP

In this category, the two terms of each related pair are synonymous.

THIN : SLIM : : SLENDER . (*a.* lean *b.* tall *c.* wan *d.* incorporeal)

THIN and SLIM are synonymous, as are SLENDER and LEAN.

Answer (*a*)

The two pairs of terms need not be synonymous to each other. Each pair of synonymous terms can be unrelated to the other pair of synonymous terms, or even be opposite to it in meaning: