Freeman (1971):

An aptitude is a combination of characteristics indicative of an individual's capacity to acquire (with training) some specific knowledge, skill, or set of organized responses, such as the ability to speak a language, to become a musician, to do mechanical work.

All these definitions reveal the predictive nature of aptitudes. When we say that Ram or Radha has an aptitude for teaching we mean that they have the capacity or ability to acquire proficiency in teaching under appropriate conditions.

Similarly, when we say Mohan has an aptitude for music we mean that his present condition or ability reveals that if he were to learn music he would be successful. The knowledge of an individual's aptitude thus helps us to predict his future success in a particular field of activity, with appropriate training or experience.

Like so many other personality traits or characteristics, it is difficult to say whether a particular aptitude is an absolute product of heredity or of environment. Certain aspects of an aptitude may be inborn. For example, a person showing an aptitude for singing may have been born with a musical voice and a person showing aptitude for type-writing or watch repairing may have sensitive and dexterous hands. But this is one side of the picture. It is also equally possible that the musical person's aptitude may be the result of his living in the company of good musicians or the typist's aptitude may be the creation of his father or mother who also happens to be a typist.

It is safer to conclude, therefore, that the aptitude of an individual at a particular moment is in all probability, dependent upon heredity and environment both.

How Aptitude Differs from Ability and Achievement

Aptitude and present ability do not mean the same thing. A person may have no present ability to drive a car but may have an aptitude for driving—which means that his chances of being a successful driver are good provided he receives the proper training. Thus, while aptitude has a future reference and tries to predict the degree of attainment or success of an individual in an area or activity after adequate training, ability concerns itself only with the present condition—the potentiality or capability which one possesses at the present moment regardless of the past and does not try to make any assessment of one's future success or failure.

Contrary to the predictive nature of aptitude and the contemporary nature of ability, achievement is past-oriented, reflects on the past and indicates what an individual has learned or acquired in a particular field.

It does not follow, however, that we can forecast an individual's future accomplishment in any area of activity with the help of aptitude measurement. Aptitude tests, in all their forms, measure only the present ability or capacity of an individual on which a prediction of his future attainments may be based.

Difference between Intelligence and Aptitudes

The existing intelligence tests gauge the general mental ability of an individual

while aptitude tests as we have seen, are concerned with specific abilities. Therefore, whereas with the knowledge of intelligence of an individual we can predict his success in a number of situations involving mental function or activity, the knowledge of aptitudes, on the other hand, acquaints us with the specific abilities and capacities of an individual to succeed in a particular field of activity. Therefore, in predicting his achievement in some specific job, training, course or specialized instruction we need to know more about his aptitudes or specific abilities rather than his intelligence or general ability.

Difference between Aptitude and Interest

In order to succeed in a given activity, a person must have both aptitude for the activity and interest in it. This does not mean that interest and aptitude are one and the same thing. A person may be interested in a particular activity, job or training but may not have the aptitude for it. In such cases, the interest shown in a particular occupation or course of study is often not the result of personal aptitude but of some other outside influence or reason such as the wishes of parents, the probability of getting a particular appointment or job, stipend or other financial help or the prestige associated with the work. Similarly, a person having long and dexterous fingers who makes a good showing on a mechanical aptitude test may have little or no interest in becoming a watch-maker.

A guidance or selection programme must, therefore, give due weightage to the measure of aptitude as well as of interest. Both are essential for the success of an individual in a given activity, job or course of instruction.

Aptitude Testing

Aptitude tests measure or assess the degree or level of one's special bent or flair much the same way as intelligence tests are employed for measuring one's intelligence. They are chiefly used to estimate the extent to which an individual would profit from a specific course or training, or to predict the quality of his or her achievement in a given situation. For example, a mechanical aptitude test would be able to determine whether an individual would do well as a mechanic after appropriate training and with the right motivation.

Two types (based on the specific purpose served) of aptitude tests are usually employed. These are, specialized aptitude tests and general aptitude tests.

Specialized Aptitude Tests

These aptitude tests have been devised to measure the aptitudes of individuals in various specific fields or activities. Generally, these tests can be divided into the following sub-types according to the specific aptitude tested by them:

1. Mechanical aptitude tests
2. Musical aptitude tests
3. Art judgement tests
4. Professional aptitudes tests, i.e. tests to measure the aptitude for professions like teaching, clerical duties, medicine, law, engineering, salesmanship, research etc.

3. Scholastic aptitude tests, i.e. tests to measure the aptitudes for different courses of instruction.

Let us now discuss these aptitude tests in detail.

Mechanical aptitude tests. Like intelligence, mechanical aptitude is also made up of many components. While explaining its meaning, Freeman (1971) writes:

> The capacity designed by the term 'mechanical aptitude' is not a single, unitary function. It is a combination of sensory and motor capacities plus perception of spatial relations, the capacity to acquire information about mechanical matters and the capacity to comprehend mechanical relationships.

The purpose of mechanical aptitude tests is to test the above-mentioned abilities and capacities of an individual in order to assess his chances of success in mechanical pursuits.

Some well-known mechanical aptitude tests are:

1. Minnesota mechanical assembly test.
2. Minnesota spatial relations test.
3. The revised minnesota power form board (1948).
4. Stenguist mechanical aptitude tests (Parts I & II).
5. L.J.O. Rourke's Mechanical Aptitude tests (Parts I & II).
6. Bennet tests of mechanical comprehension.
7. S.R.A. mechanical aptitude test.
8. Mechanical aptitude test battery by Dr. A.N. Sharma (published by National Psychological Corporation, Agra).
9. A battery of mechanical aptitude tests (Hindi) prepared by *Mano-Vigyanshala,* Allahabad.

These tests usually include the following items:

1. Asking the subject to put together the parts of mechanical devices.
2. Asking him to replace cut-outs of various shapes in corresponding spaces on a board.
3. Solving geometrical problems.
4. Questions concerning the basic information about tools and their uses.
5. Questions relating to the comprehension of physical and mechanical principles.

For instance, the Bennet mechanical comprehension test Form AA has 60 items in pictorial form. They present mechanical problems arranged in order of difficulty and involve comprehension of mechanical principles found in ordinary situations. As an example, two items of this test are shown below (Figure 20.1 and Figure 20.2).

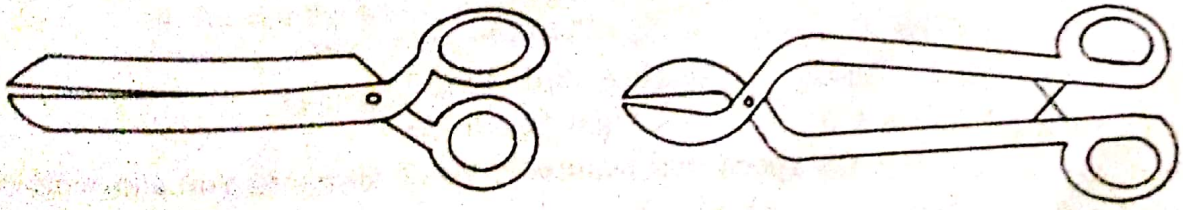


Figure 20.1 Which shear would be better for cutting metal?

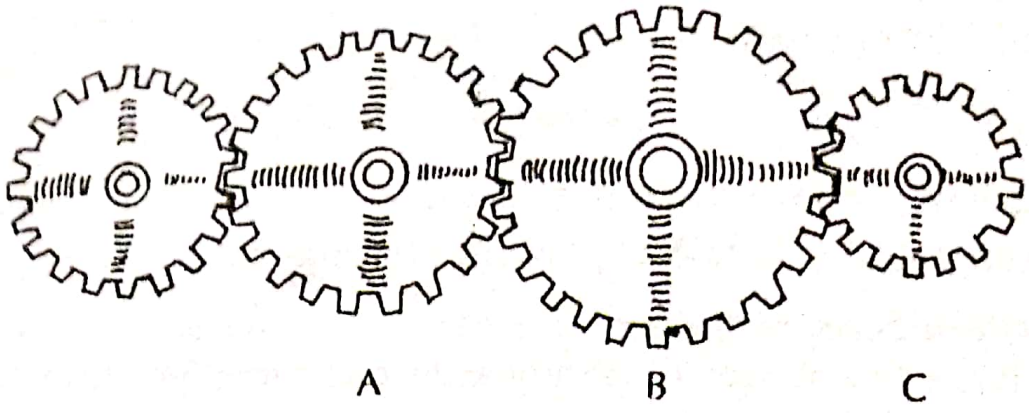


Figure 20.2 Which gear will make the most turns per minute?

Clerical aptitude tests. Like the mechanical the clerical aptitude is also a composite function. According to Bingham, it involves several specific abilities namely,

- *Perceptual ability.* The ability to register words and numbers with speed and accuracy.
- *Intellectual ability.* The ability to grasp the meaning of words and symbols.
- *Motor ability.* The ability to use various types of machines and tools like a typewriter, duplicator, cyclostyle machine, etc.

Some of the popular clerical aptitude tests are:

1. Detroit clerical aptitude examination.
2. Minnesota vocational test for clerical workers.
3. The clerical ability test prepared by the Department of Psychology University of Mysore, Mysore.
4. Clerical aptitude test battery (English and Hindi), Bureau of Educational and Vocational Guidance, Patna (Bihar).
5. Test of clerical aptitude prepared by the Parsee *Panchayat* Guidance Bureau, 209, Hornby Road, Bombay-400001

Musical aptitude tests. These tests have been devised for discovering musical talent. One of the important musical aptitude tests is described below:

Seashore measure of musical talent. It gives consideration to the following musical components:

- discrimination of pitch;
- discrimination of intensity of loudness;
- determination of time interval;
- discrimination of timbre;
- judgement of rhythm;
- tonal memory.

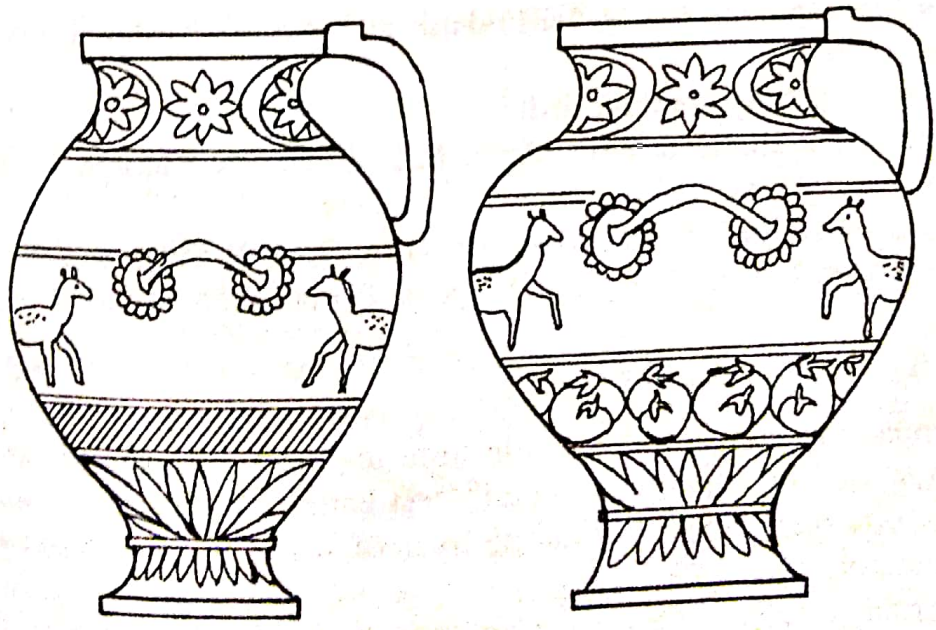
The test items in this battery are presented on phonograph records. The subject sits down, listens and attempts to discriminate. He is required to mark his responses on an answer form supplied to him by the examiner. The instructions in these tests are of the following nature:

> You will hear two tones which differ in pitch. You are to judge whether the second is higher or lower than the first. If the second is higher, record H, if lower, record L.

Aptitude for graphic art. These tests are devised to discover the talent for graphic art. Two important tests of this nature are:

- The Meier art judgement test.
- Horne art aptitude inventory.

In the Meier art judgement test there are 100 pairs of representational pictures in black and white. Figure 20.3 shows one such pair.



In this pair the subject is required to select the original and aesthetically superior work on the basis of the shapes of the bowls

Figure 20.3 Graphic art aptitude testing.

One item of each pair is an acknowledged art masterpiece while the other is a slight distortion of the original. It is usually altered in such a way that it

violates some important principle of art. The examinees are informed regarding which aspect has been altered and are asked to choose from each pair the one that is better, more pleasing, more artistic, and aesthetically more satisfying. For example, in the above illustration, the examinees are required to select the original and aesthetically superior work on the basis of the shapes of the bowls. The number of correct responses is taken as a measure of the subjects judgement or aptitude for graphic art.

Another important test of measuring aptitude for graphic art is the Horn art aptitude inventory. It requires the subject to produce sketches from given patterns of lines and figures. The created sketches of the subject are then evaluated against the standard given by the author of the test.

Tests of scholastic and professional aptitudes. Many aptitude tests have been designed for the selection of students for admission to specific courses or professions like engineering, medicine, law, business management, teaching etc. Some of these aptitude tests are:

1. The American council of education scholastic aptitude test (ACE).
2. Scholastic aptitude test (SAT) developed in U.S.A.
3. Stanford scientific aptitude test by D.L. Zyve.
4. Science aptitude test (after Higher Sec. stage); N.I.E. Delhi.
5. Moss scholastic aptitude test for medical students.
6. Ferguson and Stoddard's law aptitude examination.
7. Tale legal aptitude test.
8. Pre-engineering ability test (Education Testing Service, U.S.A.).
9. Minnesota engineering analogical test.
10. Coxe-Orleans prognosis test of teaching ability.
11. Teaching aptitude test by Jai Prakash and R.P. Shrivastav, University of Saugar (M.P.).
12. Shah's teaching aptitude test.
13. Teaching aptitude test by Moss, F.A. & Others, George Washington University Press.
14. Teaching aptitude test battery (Hindi) by Dr. R.P. Singh & S.N. Sharma (published by National Psychological Corporation, Agra).