Philip Carter

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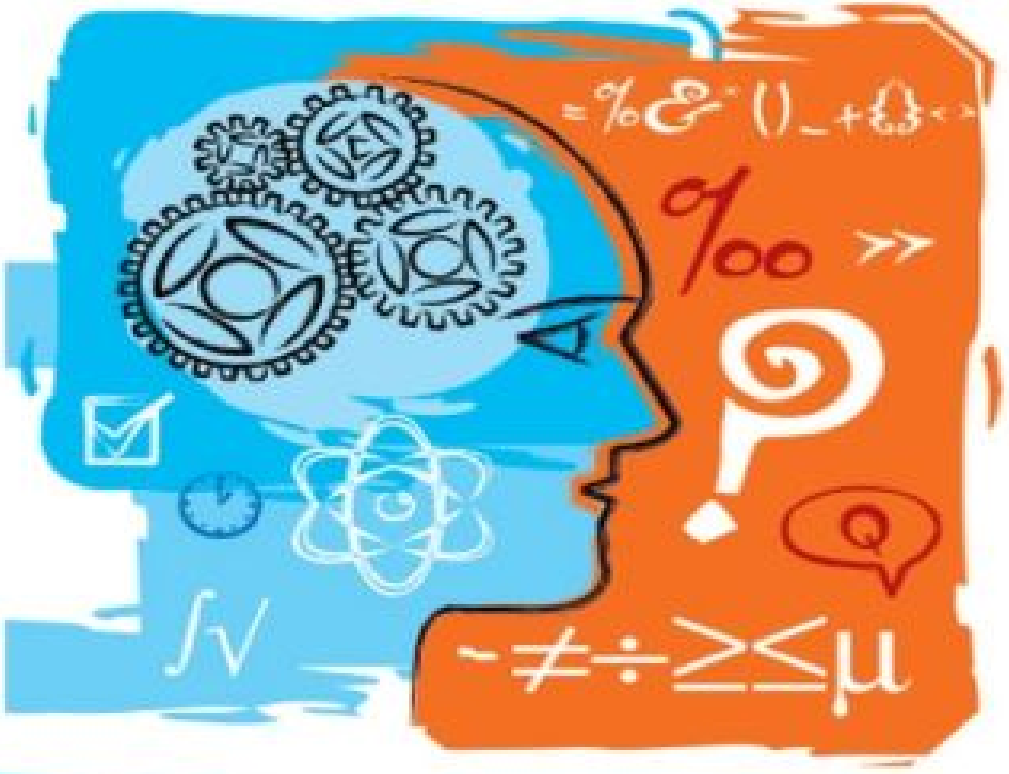

The Complete Book of Intelligence Tests

500 Exercises to Improve, Upgrade and Enhance Your Mind Strength

THE IQ WORKOUT SERIES

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THE COMPLETE BOOK OF INTELLIGENCE TESTS

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Visit our Home Page on www.wileyeurope.com or www.wiley.com

Other Wiley Editorial Offices

John Wiley & Sons Inc., 111 River Street, Hoboken, NJ 07030, USA

Jossey-Bass, 989 Market Street, San Francisco, CA 94103-1741, USA

Wiley-VCH Verlag GmbH, Boschstrasse 12, D-69469 Weinheim, Germany

John Wiley & Sons Australia Ltd, 33 Park Road, Milton, Queensland 4064, Australia

John Wiley and Sons (Asia) Pte Ltd, 2 Clementi Loop #02 — 01, Jin Xing Distripark, Singapore 129809

John Wiley & Sons Canada Ltd, 22 Worcester Road, Etobicoke, Ontario, Canada M9W 1L1

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British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

eISBN : 978-1-907-31204-5

Typeset in 11=14 pt Garamond by MCS Publishing Services Ltd, Salisbury, Wiltshire. Printed and bound in Great Britain by T.J. International Ltd, Padstow, Cornwall. This book is printed on acid-free paper responsibly manufactured from sustainable forestry, in which at least two trees are planted for each one used for paper production.

1

Introduction

Intelligence may be narrowly defined as the capacity to acquire knowledge and understanding, and use it in different novel situations. It is this ability, or capacity, which enables the individual to deal with real situations and profit intellectually from sensory experience.

A test of intelligence is designed to formally study, under test conditions, the success of an individual in adapting to a specific situation.

There are a number of different methods which purport to measure intelligence, the most famous of which is the IQ, or intelligence quotient test. In the formation of such tests many psychologists treat intelligence as a general ability operating as a common factor in a wide variety of aptitudes.

Whilst many IQ tests measure a variety of different types of ability such as verbal, mathematical, spatial and reasoning skills, there is now a second school of thought in which it is believed that the earlier definitions of intelligence may be too simplistic.

It is now becoming increasingly recognised that there are many different types of intelligence and that a high measured IQ, although desirable, is not the only key to

success in life. Other characteristics, such as outstanding artistic, creative or practical prowess, especially if combined with personal characteristics such as ambition, good temperament and compassion, could result in an outstanding level of success despite a low measured IQ. It is because of this that in recent years CQ (creative quotient) and EQ (emotional quotient), to name just two examples, have come to be regarded as equally important as, or even more important than, IQ measurement.

It should also be pointed out that having a high IQ does not mean that one has a good memory. A good memory is yet another type of intelligence, and could result in high academic success despite a low measured IQ test score.

The object of this book is to identify different types of intelligence and bring together tests for different aspects of intelligence into one book, and provide an objective assessment of abilities in a number of different disciplines.

This will, therefore, give readers the opportunity to identify their own strengths and weaknesses and thus enable readers to build on their strengths and work at improving their performance in areas of weakness.

As well as the identifying of such strengths and weaknesses, the tests and exercises in this book perform another important function, that of using and exercising the brain.

Despite the enormous capacity of the brain, we only use on average 2% of our potential brainpower. There is, therefore, the potential for each of us to expand our brainpower considerably.

It is important that we continually use our brain, for example, the more we practise at tests of verbal aptitude, the more we increase our ability to understand the meaning of words and use them effectively; the more we practise at

mathematics, the more confident we become when working with numbers; and the more we practise our ability to move our fingers and manipulate small objects, the more dextrous we become at operations involving this type of aptitude.

Our brain is undoubtedly our greatest asset, yet, for most of us, it is the part of the body we most take for granted.

Our brain needs exercise and care in the same way as other parts of the body. We eat the right foods to keep our heart healthy, we moisturise our skin to keep it from drying out and, just as gymnasts strive to increase their performance at whatever level they are competing, by means of punishing training schedules and refinement of technique, there are exercises, or mental gymnastics, we can do to increase the performance of our brain and enhance quickness of thought.

Many people still have the outdated belief that there is little they can do to improve the brain they are born with and that brain cells continually degenerate with age, but in fact our brain cells continually develop new and stronger connections and adult brains can grow new cells, irrespective of age.

We should all be aware that we have the capacity to put our brain to even more use and unleash many hitherto untapped creative talents by continually exploring new avenues, experiences and learning adventures. By continually exploiting our enormous brain potential, we all have the ability to make more and stronger connections between our nerve cells, with the result that not only our mental but also our physical long-term well-being will improve.

Whilst the aim of the tests and exercises is therefore two-fold, that of identifying individual strengths and weaknesses and that of exercising the brain, they are at the same time,

and equally importantly, designed to provide fun and entertainment to those who take them.

Aspects of intelligence

Although it is difficult to define intelligence, indeed it appears to have no formal definition, there is, nevertheless, at least one particularly apposite definition: the capacity to learn and understand.

Scores from standardised intelligence tests (IQ scores) are often used to define one's intelligence level. It is, however, becoming increasingly accepted that they do not reveal the complete picture and only provide a snapshot of a person's ability in the area under examination, so that, for example, someone who has scored highly on a verbal test can only be said to have a high verbal IQ and someone who has scored highly on a mathematical test can only be said to have a high numerical IQ. Obviously, therefore, the more different types of disciplines that are tested and examined, the more accurately the intelligence level of the individual can be assessed.

Whilst IQ testing is broadly based on the principle of a measurable and genetically inherited intelligence that is cast in stone for every individual and does not increase throughout adulthood, there is now another school of thought which believes there are many more different types of intelligences, some of which could be as a result of our upbringing and development and some of which could be the result of a natural talent with which we are born.

The concept of general intelligence, or g, was devised in the early twentieth century by the English psychologist Charles Spearman, who established g as a measure of performance in a variety of tests.

Spearman’s research led him to the conclusion that the same people who performed well in a variety of mental tasks tended to use a part of the brain that he termed g. The g factor, therefore, laid the foundation for the concept of a single intelligence, and the belief that this single, and measurable, intelligence enables us to perform tasks of mental ability.

Recent studies have to a certain extent reinforced Spearman’s theory, and research has found that the lateral prefrontal cortex is the only area of the brain where an increase in blood flow takes place when volunteers tackle complicated puzzles.

Despite this, Spearman’s concept remains highly controversial and is becoming increasingly challenged by those who claim that the concept of a single overall intelligence is too simplistic.

At the same time, there is a body of research whose findings suggest that our mental ability is not determined by biological inheritance, but as the result of social factors such as education and upbringing.

Whilst IQ tests are, and will remain, helpful in predicting future performance or potential in many areas, they do not provide us with other information, such as the ability to connect with other people emotionally or perform creative tasks that involve the use of imagination.

Although most IQ testing only assesses what is termed ‘general ability’ in three categories of intelligence, numerical, verbal and spatial (abstract) reasoning, there are several other equally important and valuable intelligences that need to be recognised and developed.

The theory of multiple intelligence (MI) advocates that the traditional view of a single general intelligence, g, is too narrow and that humans have multiple intelligences. By

expanding our definition of intelligence to include multiple intelligences, we can identify, appreciate and nurture more of our strengths.

This is important, as it would be as rare for any one individual to be endowed in all the different intelligences as it would for any one individual not to possess some kind of talent. We all tend to be aware of some of our abilities and limitations, for instance, some of us may be great musicians but completely hopeless when it comes to fixing a problem with our car; others may be championship-class chess players but would never be able to smash a tennis ball into the opposing player's court; and others may possess great linguistic and mathematical skills but feel completely at a loss trying to make small talk at social gatherings. The fact is that no-one is talented in every domain and no-one is completely incapable in every domain.

The originator of the theory of multiple intelligences, Howard Gardner, a professor of education at Harvard University, defines intelligence as the potential ability to process a certain sort of information. The different types of intelligence are for the most part independent of one another, and no type is more important than the other.

In all, Gardner identifies seven different types of intelligence. These can be summarized as follows:

1. Verbal=linguistic, e.g. lexical skills, formal speech, verbal debate, creative writing.
2. Body=kinesthetic (movement), e.g. body language, physical gestures, creative dance, physical exercise, drama.
3. Musical=rhythmic, e.g. music performance, singing, musical composition, rhythmic patterns.
4. Logic=mathematic, e.g. numerical aptitude, problem solving, deciphering codes, abstract symbols and formulae.

5. Visual=spatial, e.g. patterns and designs, painting, drawing, active imagination, sculpture, colour schemes.
6. Interpersonal (relationships with others), e.g. person-to-person communication, empathy practices, group projects, collaboration skills, receiving and giving feedback.
7. Intrapersonal (self-understanding and insight), e.g. thinking strategies, emotional processing, knowing yourself, higher order reasoning, focusing=concentration.

Although aspects of it are included in several of the above categories; in addition to the above seven basic types of intelligence can be added creativity, which has sometimes been referred to as ‘the eighth intelligence’.

Additionally, if creativity is the eighth intelligence, then memory must be the ninth, and both creativity and memory are explored and tested in detail in Chapters 4 and 6, respectively.

Whilst Spearman concluded that people who performed well at varying tasks tended to use the same part of the brain, g, Gardner asserts that each of the above intelligences is located in one or more particular areas of the brain. Some of the evidence for this belief is provided by the study of people who have suffered brain damage, either from strokes or other causes, and who may, for example, still be able to sing words despite having lost the ability to use expressive speech.

Although the jury may still be out on the debate as to whether the g factor, as gauged by IQ tests, is just one single general intelligence, or whether there are, as Gardner and others suggest, a set of independent mental domains, it would appear to be coming increasingly apparent that, as we learn more about the human brain and how different

parts of the brain appear to generate different intelligences, the more compelling Gardner’s theory becomes.

The main lesson to be learned from this is that people can be intelligent in many different ways. It is completely wrong to write off or even put down someone who has scored badly in an IQ test which, after all, has only provided us with one type of information about that individual. All of us have the potential for achievement in some kind of intelligence and we also possess the potential for improvement in many other areas.

Although there are types of intelligence that cannot be tested in a book, for example, aptitude at performing physical tasks or playing a musical instrument, in the chapters that follow as many different types of intelligence will be tested and explored as is feasible to do.

Intelligence quotient (IQ)

Intelligence quotient (IQ) is an age-related measure of intelligence level and is described as 100 times the mental age. The word ‘quotient’ means the result of dividing one quantity by another, and a definition of intelligence is mental ability or quickness of mind.

Such tests are based on the belief that every person possesses a single general ability of mind. It is this which determines how efficiently each of us deals with situations as they arise, and how we profit intellectually from our experiences. This ability of mind varies in amount from person to person, and is what intelligence (IQ tests) attempt to measure.

Generally such tests consist of a graded series of tasks, each of which has been standardised with a large

representative population of individuals. Such a procedure establishes the average IQ as 100.

IQ tests are part of what is generally referred to as ‘psychometric testing’. Such test content may be addressed to almost any aspect of our intellectual or emotional make-up, including personality, attitude and intelligence.

Psychometric tests are basically tools used for measuring the mind; the word ‘metric’ means measure and the word ‘psycho’ means mind. There are two types of psychometric test, which are usually used in tandem. These are aptitude tests, which assess your abilities, and personality questionnaires, which assess your character and personality.

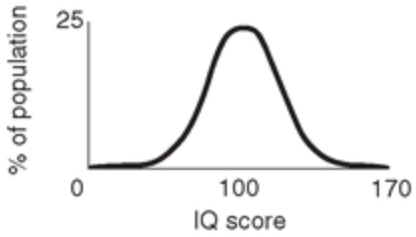
In contrast to specific proficiencies, intelligence tests are standard examinations devised to measure human intelligence as distinct from attainments. There are several different types of intelligence test, for example, Cattell, Stanford — Binet and Wechsler, each having its own different scale of intelligence.

The Stanford — Binet is heavily weighted with questions involving verbal abilities and is widely used in the United States of America, and the Weschler scales consist of two separate verbal and performance sub-scales, each with its own IQ rating.

It is generally agreed by advocates of IQ testing that an individual’s IQ rating is mainly hereditary and remains constant in development to about the age of 13, after which it is shown to slow down, and beyond the age of 18 little or no improvement is found. It is further agreed that the most marked increase in a person’s IQ takes place in early childhood, and theories are continually put forward about different contributory factors, for example, it has been claimed recently, following research in Japan, that the playing of computer games by children, which involve a high

degree of skill and agility of mind, have resulted in higher IQ measurement.

IQ Tests are standardised after being given to many thousands of people and an average IQ (100) established, a score above or below this norm being used to establish the subject's actual IQ rating.



Because beyond the age of 18 little or no improvement in a person's IQ rating is found, the method of calculating the IQ of a child is different to the method used for an adult.

When measuring the IQ of a child, the subject will attempt an IQ test which has been standardized with an average score recorded for each age group. Thus, a child aged 10 years who scored the results expected of a child of 12 would have an IQ of 120, calculated as follows:

$$\frac{\text{mental age (12)}}{\text{chronological age (10)}} \times 100 = 120 \text{ IQ}$$

However, adults have to be judged on an IQ test whose average score is 100 and their results graded above and below this norm according to known scores. A properly validated test would have to be given to some 20,000 people and the results correlated before it would reveal an accurate measurement of a person's IQ.

Like most distributions found in nature, the distribution of IQ takes the form of a fairly regular bell-curve (see diagram above). On the Stanford — Binet scale, half the population fall between 90 and 110 IQ, half of them above 100 and half of them below; 25% score above 110; 11% above 120; 3% above 130 and 0.6% above 140. At the other end of the scale the same kind of proportion occurs.

The earliest known attempts to rank people in terms of intelligence date back to the Chinese Mandarin system, circa 500 B.C., when studying the works of Confucius enabled successful candidates to enter the public service. The top 1% of candidates were successful in progressing to the next stage, where they would again be run off against each other, and the procedure repeated yet again through a final layer of selection. Thus, the chosen candidates were in the top 1% of the top 1% of the top 1%.

The first attempt to measure scientifically the difference between the mental abilities of individuals was made by Sir Francis Galton in the nineteenth century, when he tried to show that the human mind could be systematically mapped into different dimensions.

The first modern intelligence test was devised in 1905 by the French psychologists Alfred Binet and Theodore Simon after they were commissioned by the French government to construct tests that would ensure no child be denied admittance to the Paris school system without formal examination. The pair developed a 30-item test, which included a wide range of different types of problems.

In 1916, the American psychologist Lewis Terman revised the Binet — Simon scale to provide comparison standards for Americans from age 3 to adulthood and the concept of the ratio of the mental age to chronological age, multiplied by 100, was added. Terman devised the term ‘intelligence quotient’ and developed the Stanford — Binet intelligence

test to measure IQ after joining the faculty of Stanford University as professor of education. The Stanford — Binet test was further revised in 1937 and 1960 and remains today one of the most widely used of all intelligence tests.

In the mid-nineteenth century psychologists used information-loaded tests to assess the intelligence of their clients. Later, psychologists introduced the concept of mental speed when assessing performance. Around 1930, Furneaux demonstrated that a relationship did exist between power, meaning the absolute difficulty of a problem, and speed, meaning the time a person required to solve it. By increasing the difficulty by 30%, you double the time required to solve it, but a 60% increase will lengthen the time five-fold.

The first IQ testing on a mass scale was carried out by the US army during the First World War. Personality tests or character tests soon followed, but in the 1920s and 1930s studies began to define more closely the general concept of intelligence. What emerged was recognition of fluid and crystallised intelligence. Fluid intelligence was measured by references to spatial items, such as diagrams, drawings or pegs, and crystallised intelligence was measured through language and number.

There are many different types of intelligence tests; however, a typical IQ test might consist of three sections, each testing a different ability, usually comprising verbal reasoning, numerical ability and diagrammatic, or spatial, reasoning. In order to assess your overall general ability, the questions in the test that follows are multi-discipline and include a mix of verbal, numerical and diagrammatic questions, as well as additional questions involving logical thought processes together with a degree of lateral thinking.

While it is accepted that IQ is hereditary and remains constant throughout life and, therefore, it is not possible to improve your actual IQ, one weakness of this type of testing is that it is possible to improve your performance on IQ tests by practising the many different types of question, and learning to recognise the recurring themes.

In subsequent chapters of this book, readers will have ample opportunity to test themselves in different areas of brain activity and to identify their strengths and weakness in specific areas of intelligence.

It must be emphasised that a person who is good at IQ tests is not necessarily capable of excelling at academic tests, regardless of how logical and quick-witted he=she is. Often motivation and dedication are more important than a high measured IQ rating. To score highly on an academic test requires the ability to concentrate on a single subject, obtain an understanding of it, and revise solidly in order to memorise facts prior to an examination. Often it is difficult for someone with a high IQ to do this because of an overactive and enquiring mind, which cannot direct itself on one subject for very long and forever wishes to diversify. Such a person would have to apply a high level of self-discipline in order to succeed at academic tests but, if able to apply this self-discipline, would be likely to obtain a high pass mark.

Because the test that follows has been newly compiled for this book, it has not been standardised, so an actual IQ assessment cannot be given. Nevertheless, a guide to assessing your performance is provided in the Answers section.

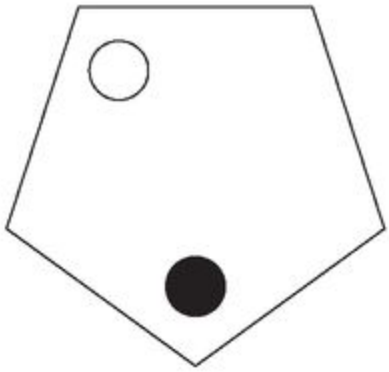
A time limit of 90 minutes is allowed for completing all 40 questions. The correct answers are given at the end of the test, and you should award yourself one point for each

completely correct answer. You should not exceed the time limit, otherwise your score will be invalidated.

Where preferred, the use of a calculator is permitted on numerical questions, except where indicated.

Test 1.1 IQ test

1. The white dot moves two places anti-clockwise at each stage and the black dot moves one place clockwise at each stage. After how many stages will they be together in the same corner?



2.

	72496	is to	1315
and	62134	is to	97
and	85316	is to	167
therefore	28439	is to	?

3. Put the following words into alphabetical order:

   arthropod, artificer, arteriole, artichoke, arthritis, articular, artillery, arthritic

4. Which two words are most opposite in meaning?

   imaginary, realistic, illegible, impracticable, radical, embellished

5. What numbers should replace the question marks?

2	6	3	7	?
6	3	6	3	?
3	6	3	6	?
5	2	6	3	?

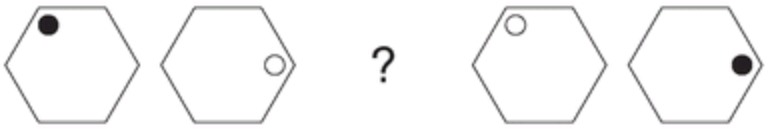
6. Which group of letters is the odd one out?

CEFH	LNOQ	UWXZ
HJKN	PRSU	DFGI

7. Identify two words (one from each set of brackets) that form a connection (analogy) when paired with the words in capitals.

RESTRAIN (suppress, deny, conceal)

WITHHOLD (curb, reserve, conceal)

8. 

Which figure should replace the question mark?

9. Spell out a 12-letter word by moving from letter to adjacent letter, horizontally and vertically (but not