Johnson O'Connor RESEARCH FOUNDATION

Choosing Intelligently

A Practical Guide To Using Your Aptitudes

This book is published by

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of the

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April 2021

Johnson O'Connor RESEARCH FOUNDATION

www.jocrf.org

"The individual who knows his own aptitudes, and their relative strengths, chooses more intelligently among the world's host of opportunities."

Choosing Intelligently

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TABLE OF CONTENTS

INTRODUCTION

We have all heard of the “born” artist or the “gifted” scientist, people who seem to fit perfectly into their chosen career. When we use these designations, it appears to us that they perform their work almost without effort, and their success comes from just being who they are.

The reality, of course, is that success always requires effort, but not all effort has to feel like labor. Our philosophy is that for the person whose aptitudes are a good match with their work, the required effort can be a source of joy rather than a burden, as that person is “doing what comes naturally”. The gifted scientist is energized by exploring the mysteries of chemical reactions, just as the born artist is inspired when faced with a blank canvas. Their success comes from following the pull of their natural abilities.

While some fortunate individuals discover early in life what their gifts are, and have opportunities to express them, a great many people are unsure about their abilities. Perhaps someone has had little opportunity for the kinds of activities that would have revealed their gifts, or is aware of some strengths but not others. Our own estimates of our abilities are not always accurate, and aspirations other people have for us can confuse matters even further. This is where aptitude testing can help.

NATURAL ABILITIES

When we say aptitudes are natural abilities, we mean they do not seem to be acquired through training or experience. Our research shows that they are stable over time, and that they also have a substantial degree of heritability. Johnson O’Connor did extensive research on the effects of practice on aptitude tests, and he found that given equivalent practice and education, those who started with the lowest scores would typically still have lower scores relative to others.

Because of these factors, it follows that test scores are not inherently good or bad, they merely indicate how a person performs different types of tasks or activities compared to other people. A low score can provide as much direction as a high score, just as being tall is an advantage for sports like basketball, while shorter athletes may have an advantage in gymnastics.

In real life, of course, it is possible that individuals with less natural ability can surpass others with higher scores through diligent application, which is why we never tell someone they can't or shouldn't do something. But we do think, and our research shows, that applying that diligence in an area that suits your natural abilities can lead to even greater career fulfillment and success.

As you read through this book, you will find lists of careers, majors, and hobbies that use each aptitude. Keep in mind that aptitudes do not function in isolation. That is why we refer to the importance of understanding any aptitude in the context of the entire pattern of scores. Much like puzzle pieces, one piece by itself has little value; it's the understanding of how the pieces fit together that provides meaning for each individual.

> "Be who you are, strive to use to the utmost every one of your natural abilities, and you will undoubtedly leave this world a better place, while finding enjoyment and satisfaction in doing so."
> — Rusty Burke, former Research Director

HISTORY

Our founder Johnson O'Connor began developing and administering aptitude measurements in 1922. A Harvard graduate with a degree in mathematics, O'Connor took a job at the General Electric Company in Massachusetts in hopes of learning engineering. He advanced from an entry level job to a department head, working under the plant manager F.P. Cox who, as an engineer by trade, was interested in finding ways to increase efficiency by applying a more scientific approach to hiring employees. When Cox created the Human Engineering Department to apply the principles of engineering to the question of human performance, O'Connor was put in charge.

O'Connor noted that when a business would evaluate materials, tools, or machinery, the traditional approach was to try them out on a sample of the work to be done. He suggested taking the same approach with people: isolate the distinguishing characteristics of a job and develop a test — or "work sample" — to determine how easily untrained individuals could accomplish the task. If the task came relatively easily to them, that should correlate with success on the job.

The first test created was a measure of dexterity, intended for use in the selection of assembly line workers. O'Connor's theory bore fruit when he discovered that the test was not only an excellent predictor of success in assembly work but that the applicants who were selected for this work on the basis of their dexterity enjoyed their jobs.

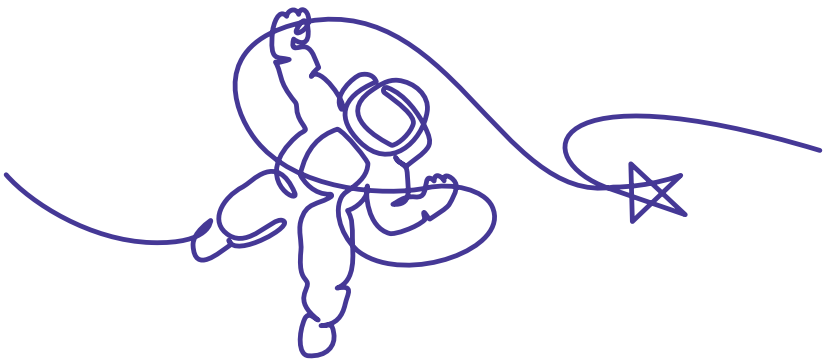
As the testing expanded to measure more aptitudes, some limitations arose with this approach. First, creating individual work samples for the hundreds of thousands of jobs that exist in the world would be impractical. Second, many jobs seemed to call not for a single ability, but a combination

of several. When examining these issues, O'Connor observed that some of the traits that were measured seemed applicable to more than one job. If they isolated traits common to many fields, it would reduce the number of needed work samples. Thus, by taking only twenty tests, one might, in essence, sample over a million jobs. An aptitude testing battery was born.

Ultimately, this discovery shifted the focus of O'Connor's endeavor. Rather than using aptitude tests on behalf of an employer, he wanted to use them to provide guidance for individuals. Demand for the testing grew as many GE employees who had taken the aptitude tests themselves asked to have their friends and relatives tested. Eventually, Johnson O'Connor began pursuing aptitude testing full-time, and, in 1939, incorporated as an independent, non-profit scientific organization called The Human Engineering Laboratory. This independence allowed O'Connor and his staff to expand their testing of occupational groups. No longer confined to the manufacturing plant, they were soon testing nurses, teachers, bankers, and more, and publishing results of these studies. Over the ensuing decades, we have continued O'Connor's efforts to test people from many occupations, sometimes from more recent fields like software engineering; sometimes replicating previous studies, such as lawyers or accountants.

The Foundation now has multiple offices around the United States, as well as a Research Department located in Chicago. Hundreds of thousands of people have learned about their natural abilities through the Foundation and used the information to make career and educational decisions.

> "The philosophy of the Human Engineering Laboratory stresses the need of surveying one's own capabilities, not with some fixed job in mind, but with the aim of making that peculiar contribution to the world of which one alone is capable, of planning life from the beginning about one's aptitudes, of reaching constantly for progress to give them ampler expression."
>
> — Johnson O'Connor



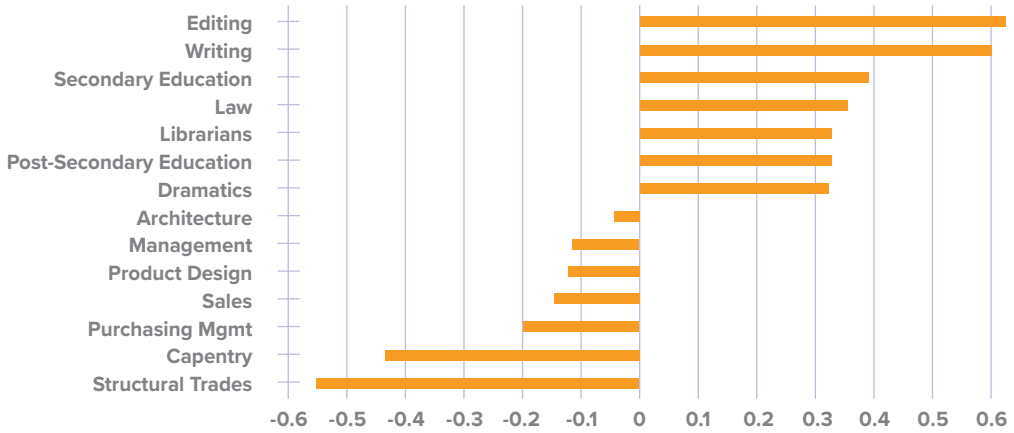
INTERPRETING THE DATA

As you read through this book, you will find charts and graphs similar to the one below. Any mention of career and aptitude connections is based on our years of research and the data represented in the graphs. Below are some tips for how to interpret the graphs.

We represent the data using z-scores. Z-scores are standardized scores that allow us to derive meaning about the importance of specific aptitudes in different career areas.

As a general guide, a z-score of .3 or higher is considered to be a statistically relevant indication that an aptitude is important for a career.

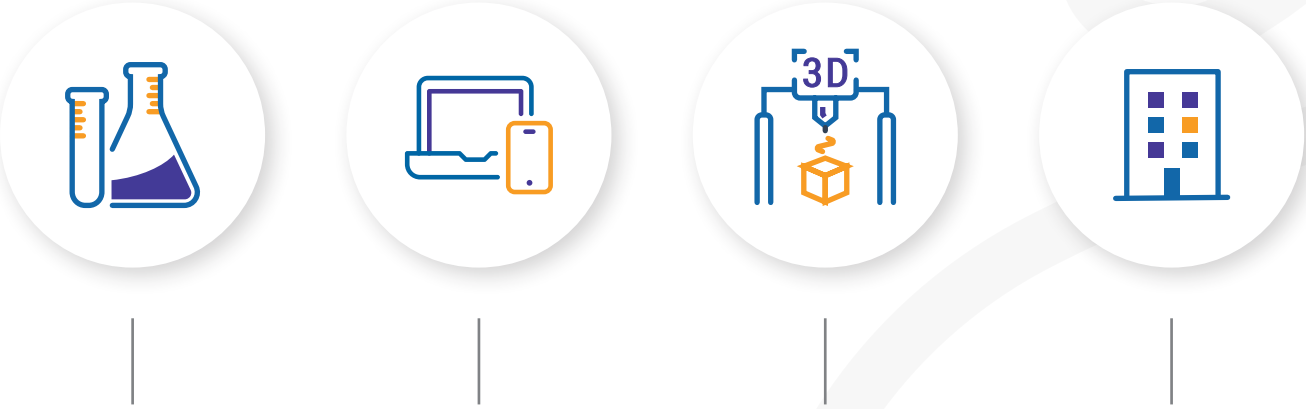
SILOGRAMS



A negative z-score indicates that the average score for a career is lower than the average score of all examinees. For example, people who work in structural trades score significantly lower in Silograms than the general population.

A positive z-score indicates that the average score for a career is higher than the average score of all examinees. For example, people who work in editing and writing score significantly higher on our Silograms test than the general population.

01 Structural Visualization



Science | Technology | 3D Thinking | Building

THE TESTS

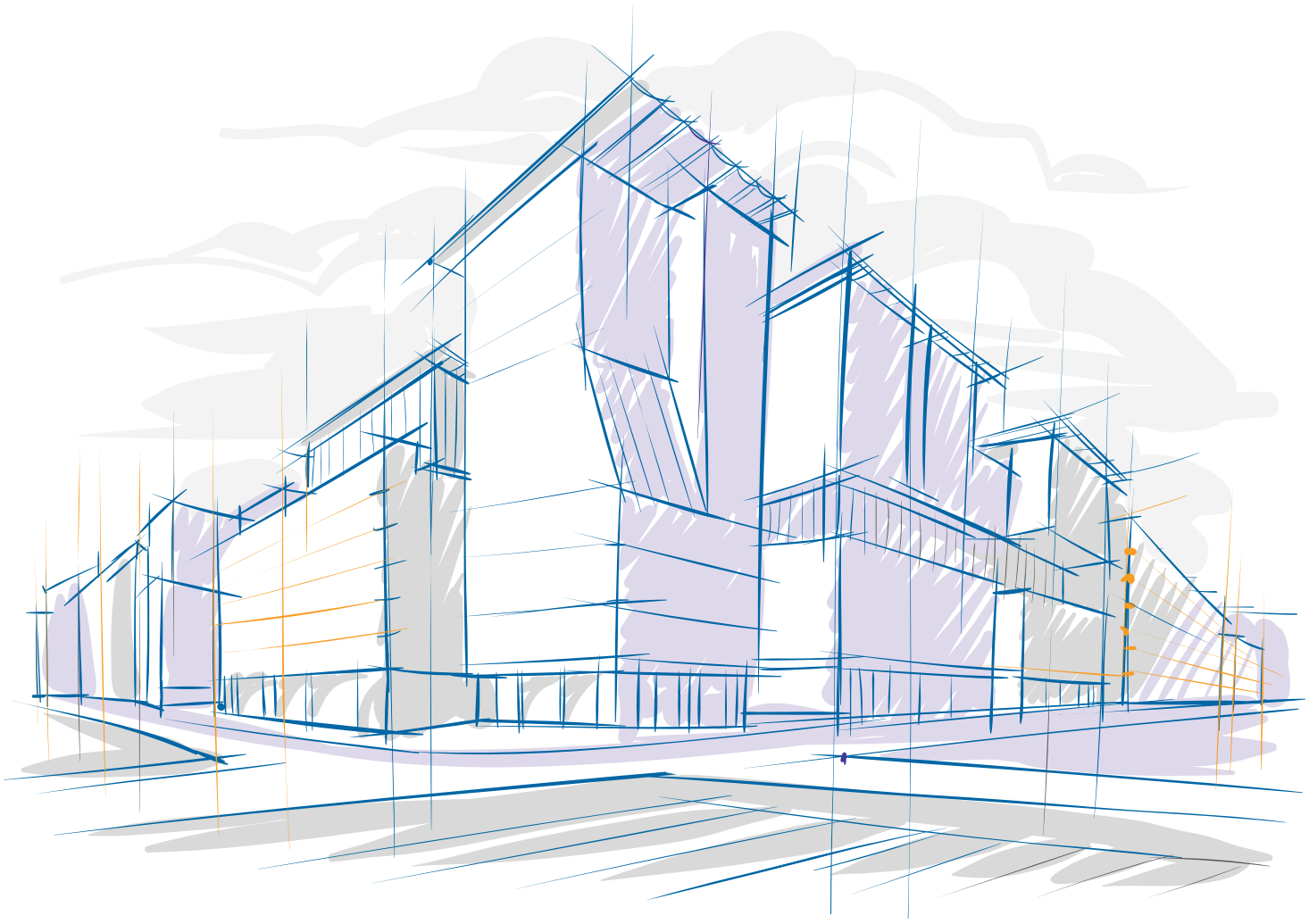
The Structural Visualization score is a composite of scores on two different tests. We measure this aptitude in two ways to increase the statistical reliability of the score.

- **Paper Folding** A series of pictures show a square piece of paper being folded and then punched with a hole. Examinees imagine where the hole or holes will be when the paper is completely unfolded.
- **Wiggly Block** Wood blocks that have been cut into wiggly pieces are taken apart, and examinees are asked to reassemble them.

THE APTITUDE

Scoring high in Structural Visualization (spatial thinking) indicates the ability to visualize in three dimensions, rotate a three-dimensional object in your mind, or imagine what something looks like from another angle. Engineering, architecture, industrial design, software engineering, sculpting, sciences, medicine, physical therapy, surveying, carpentry, and metallurgy are all fields that allow you to use Structural Visualization. In addition, our research has suggested that occupations such as computer programming, actuarial science, and mathematical research are also suitable for those who have this aptitude.

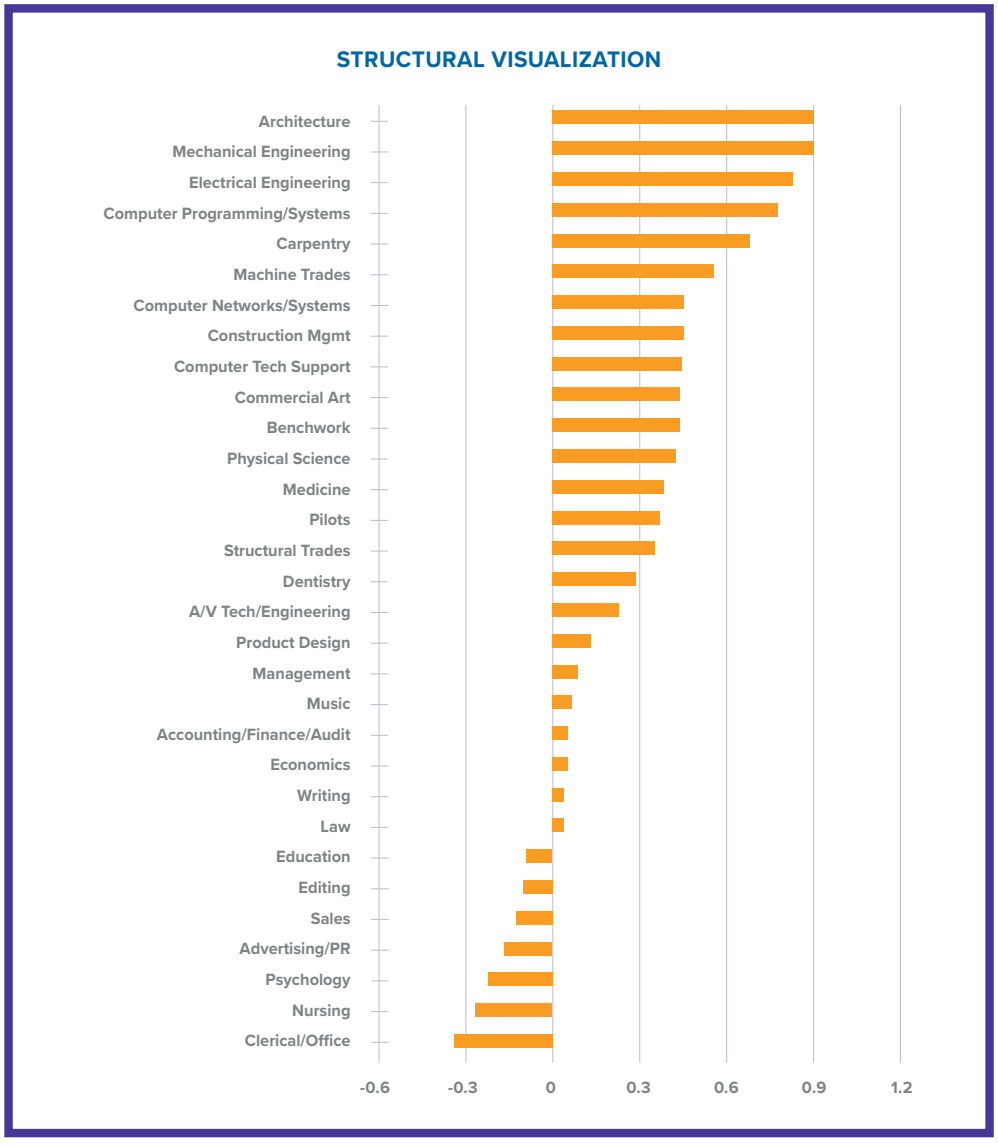
From a young age, people who score high on our tests of Structural Visualization are often drawn to taking things apart and putting them back together, building things, designing things, and figuring out how things work. Three-dimensional thinkers frequently enjoy having a tangible outcome for their efforts or having visible evidence that they've accomplished something.



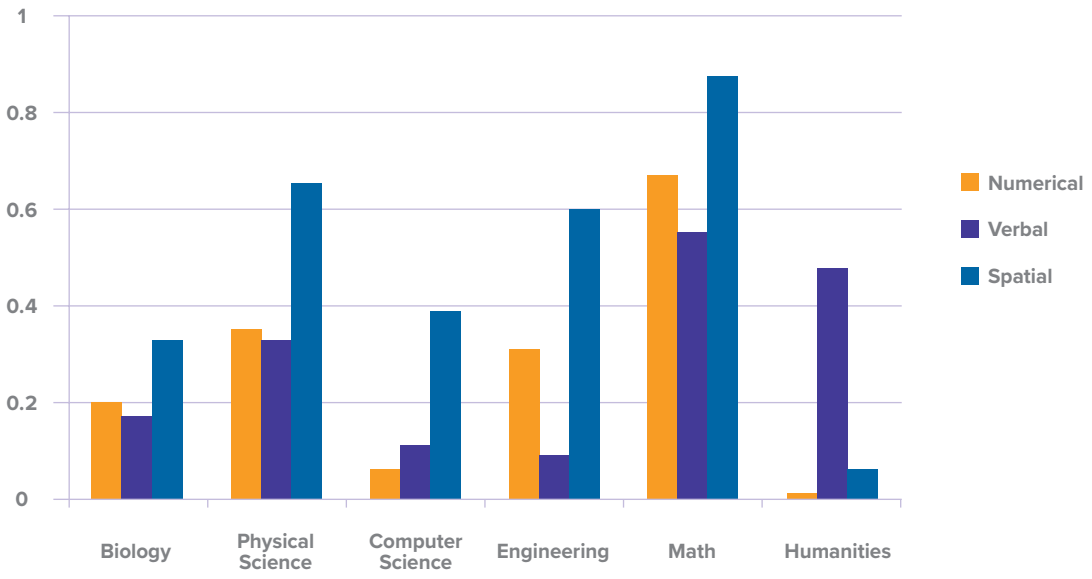
WHO USES STRUCTURAL VISUALIZATION?

Our research into the Structural Visualization aptitude shows some of the most dramatic effects of any test in the aptitude battery. The aptitude very clearly characterizes fields associated with 3D thinking like mechanical engineering, architecture, and carpentry.

There is also strong evidence connecting spatial thinking and science careers. Three-dimensional reasoning helps scientists think about the space and relationship between physical objects, which has led to breakthroughs like the discovery of the DNA double helix. Some of the most well-known names in science like Albert Einstein, Thomas Edison, and Nikola Tesla all described their creative processes as including visualization. A study of Albert Einstein's brain even showed that his parietal lobes — the part of the brain which is linked to spatial thinking — were actually 15% larger than the average person's.



NUMERICAL, VERBAL, AND SPATIAL Z-SCORES BY MAJOR



Structural Visualization scores correlate strongly with science, technology, engineering, and math (STEM) majors but are much less significant in the humanities.

PAPER FOLDING AND WIGGLY BLOCK: TWO TYPES OF SPATIAL MEASUREMENT

The Wiggly Block test was first designed in the early 1920s by Johnson O'Connor in an effort to find a test on which engineers would perform better than people in less mechanical fields. Paper Folding was developed in the 1970s and officially incorporated into the battery in 1980. The two tests correlate strongly with one another, but we believe that each represents a slightly different aspect of the overall Structural Visualization aptitude. Wiggly Block is a more hands-on measurement of spatial ability, while Paper Folding is more conceptual.

> JOC has administered other 3D tests in the past like the Turning Block, the Incomplete Open Cubes, the Black Cube, and the Triangles tests.

TIPS FOR HIGH STRUCTURAL VISUALIZATION

IN THE WORKPLACE

- Look for career paths that let you build, design, create, invent, research, fix, make, or do in a three-dimensional space. Work that involves engaging solely with abstract ideas (like teaching literature) might not be as satisfying to you.
- Consider learning web design, computer programming, or drafting programs like AutoCAD. These skills can be learned outside of a degree program and may help you pivot to a spatial career.
- If you work in a nonspatial career like finance or sales, look for opportunities to work for companies that do spatial work, or transition to a more technical industry that builds on your existing experience. Finance skills could be used at an engineering firm; sales experience could be applied to tech or medical sales; and an attorney could use their knowledge of law in real estate development.

IN THE CLASSROOM

- Attend a technical or STEM-oriented high school.
- Look for 3D extracurriculars like theater technology, volunteering in home repair or construction, environmental conservation, technical education competitions, or working in a school or community garden.
- Join clubs like science, math, robotics, or women in STEM.
- Take upper-level math and science courses, visual art, or industrial arts classes.

IN DAILY LIFE

- Try hobbies like metalworking, home improvement projects, reading science fiction, technical theater, woodworking, automotive repairs, or furniture building.
- Volunteer for Habitat for Humanity, the Peace Corps, or with organizations working in medicine, science, or infrastructure.
- Get involved in the technical aspects of education: Tutor students in a STEM field or volunteer with a school's information technology (IT) or audiovisual (AV) departments.
- Join your neighborhood council and make decisions on real estate projects near your home.

STRUCTURAL VISUALIZATION

SPATIAL ABILITY WITHOUT SPATIAL INTERESTS

Not everyone who scores high in Structural Visualization has a strong interest in technical fields like engineering or programming. If your pattern points to STEM but your interests don't align, you might still be most satisfied if your work produces a concrete result or requires you to grapple with or explain 3D concepts. Think: Why do technical fields not appeal to you? Do they sound too dry? You might be more interested in fields like 3D design where you get to solve three-dimensional problems in a creative way. Are you drawn more toward working with people than with things? Fields like urban planning, economics, or medicine could allow you to have a huge impact in areas like international development or city governance while still tapping into your talent for 3D thinking. Explore interdisciplinary majors (or make your own) with names like "Digital Humanities," "Technology and Business," or "Physics and Philosophy." These will often give you a mix of humanities and STEM classes.

STRUCTURAL VISUALIZATION AND LOW GRAPHORIA

Some people who score high in Structural Visualization but low in Graphoria (clerical speed and accuracy) enjoy working hands-on with objects and can feel frustrated by traditional classroom learning. Remember that there are many different ways to be successful in your career. If a four-year university isn't the right learning environment for you, you might be happier in trade school, the military, or apprenticeships where you can learn by doing. Spatial thinkers are often natural mechanics, born artisans, and gifted tradespeople.

Make it Spatial

IF YOU'RE INTERESTED IN	TRY
Nonprofits	Global Health, International Development
Business	Industrial Engineering, Tech Sales, Information Technology
Writing	Technical Writing, Science Journalism
Education	STEM Education, Industrial Arts Teaching

IF YOU'RE INTERESTED IN	TRY
Psychology	Neuroscience, Psychiatry, Behavioral Decision Science, Genetic Counseling
Visual Art	Sculpture, Animation, Web Design, Filmmaking
Law	Patent Law, Construction Law, Technology Law

MAJORS, MINORS, AND COURSES FOR STRUCTURAL VISUALIZATION

People who score high in Structural Visualization are usually most engaged when they're able to grapple with three-dimensional or technical concepts or make something they can see or touch. In school that can mean looking for classes that are more STEM- or design-oriented than those in the humanities or liberal arts. Because pathways like science, engineering, or computer science tend to require technical backgrounds, it may make sense for the spatial student to choose a technical major or double major (especially if also interested in courses like literature or history). This could lead to more opportunities to use your aptitude pattern down the road.

IF YOUR PATTERN IS SPATIAL

3D Design

- Interior Design
- Industrial Design
- Animation
- Video Game Design
- Fashion Design
- Filmmaking
- Urban Design
- Web Design
- Sculpture

Science

- Physics
- Astronomy
- Chemistry
- Geology
- Geography
- Forestry
- Food Science
- Neuroscience
- Climate Science

Trades

- Carpentry
- Machine Trades Technology
- Architectural Drafting
- Patternmaking and Tailoring
- Robotics Technology
- Manufacturing Technology
- Mechanics
- Engineering Technology
- Equipment Installation and Repair
- Toolmaking

Healthcare

- Medicine
- Psychiatry
- Surgery
- Dentistry
- Physical Therapy
- Genetic Counseling
- Orthotics or Prosthetics

Building and Spaces

- Engineering
- Construction Management
- Real Estate Development
- Urban Planning
- Architecture

Technology

- Computer Science
- Educational Technology
- Information Technology
- Biotechnology
- Cyber Security
- Geographic Information Systems

IF YOUR PATTERN IS NONSPATIAL

AN ABSTRACT APPROACH

People who do not score high in Structural Visualization are usually happier working with ideas, people, or theories, rather than with three-dimensional things. In other words, you might prefer reasoning with abstract ideas or concepts, like a psychologist would. The feelings, memories, and emotions of a psychologist's clients don't exist as physical, measurable entities but as abstract concepts. Spatial thinkers might instead be looking for concrete results that aren't available in that line of work.

Our research shows that business executives, teachers, accountants, lawyers, salespeople, and writers, among others, tend not to score high in Structural Visualization. In many jobs that rely on verbal or abstract reasoning, it's an advantage to be a nonspatial thinker – to the extent that not having the Structural Visualization aptitude seems to help someone be successful.

College majors in the liberal arts, social sciences, education, or business can be good fits for abstract reasoning. If you're considering a two-year degree, look for trades like law enforcement, cosmetology, or medical and lab technology.

STRUCTURAL VISUALIZATION AS A CONTINUUM

We broadly think of low or average Structural Visualization scores as nonspatial approaches, but there is a difference between a low score in this area and one that is average or even above the mean, say 60th or 65th percentile. We can't say definitively that someone who scores so close to the high range would not be successful at engineering or the physical sciences; we also can't say that they would thrive in those fields.

If you find yourself in that "in between" spot of being higher than others but not quite at the high range, you might look for directions in science, business, psychology, etc., where Structural Visualization might or might not be used, like the examples on the following page.

	Less SV Used	Some SV Used	More SV Used
PSYCHOLOGY	Family Therapist School Psychologist Counselor Social Worker	Neuropsychologist Clinical Psychologist	Neuroscientist Neurosurgeon Psychiatrist
NUMERICAL	Accountant Auditor Underwriter	Economist Risk Assessment	Data Scientist Actuary
SCIENCE	Sociology Political Science Cultural Anthropology	Biology Environmental Science Botany Ecology	Physics Chemistry Astronomy Geology
REAL ESTATE	Real Estate Sales or Brokerage	Real Estate Appraisal Building Inspection Facilities Management	Architecture Urban Planning Real Estate Development

DIFFERENT APPROACHES TO STEM

INTEREST VERSUS APTITUDE

Many clients come in for testing with an interest in STEM fields. Our research shows that STEM professions correlate with high Structural Visualization, so what happens when you have a non-spatial pattern but were planning a career in medicine or technology? Consider the following questions:

- What draws you to the spatial field you were considering? Could a different, nonspatial field be equally satisfying? For example, someone who was considering becoming a surgeon might be just as satisfied working as a psychologist or nurse, if their driving motivation is to help others.
- Are there nonspatial opportunities within the spatial industry you've been considering? Any tech startup or company will also have opportunities in law, marketing, project management, human resources, social media, business development, and finance. A nonspatial approach doesn't mean you can't be in the spatial world that excites you.
- Does the branch of science that interests you exist on the Structural Visualization spectrum? Some sciences (like physics) might be really challenging for a nonspatial person, but others like biology, environmental science, and botany seem to fall right in the middle. They likely require some ability to conceptualize three-dimensional concepts, but professionals in these fields don't score as high in Structural Visualization as physicists and chemists do.

WOMEN IN STEM — DRIVERS TO SUCCESS

Aptitude testing predicts natural potential. Our research department was curious to examine which aptitudes predicted success and satisfaction for women working in STEM fields. The women they studied in branches like engineering, computer science, and medicine more often than not had average to high Structural Visualization scores, but even higher scores for this group were found in Numerical Reasoning and Silograms (word learning). This indicates to us that a talent for understanding numbers and a facility with language could be a STEM pattern in their own right. That's not too surprising when you consider how much terminology and upper-level math exist in technical work.

> Females are underrepresented in STEM. One of our recent studies showed that only 20% of female examinees with STEM aptitudes chose those majors.

02 Ideaphoria

Writing | Innovation | Teaching | Communication

THE TEST

A hypothetical question is given, and the examinee writes as much as they can on the topic. It is one of two measures (along with the Foresight test) of Divergent Thinking — thinking that occurs in a spontaneous, free-flowing, nonlinear manner.

THE APTITUDE

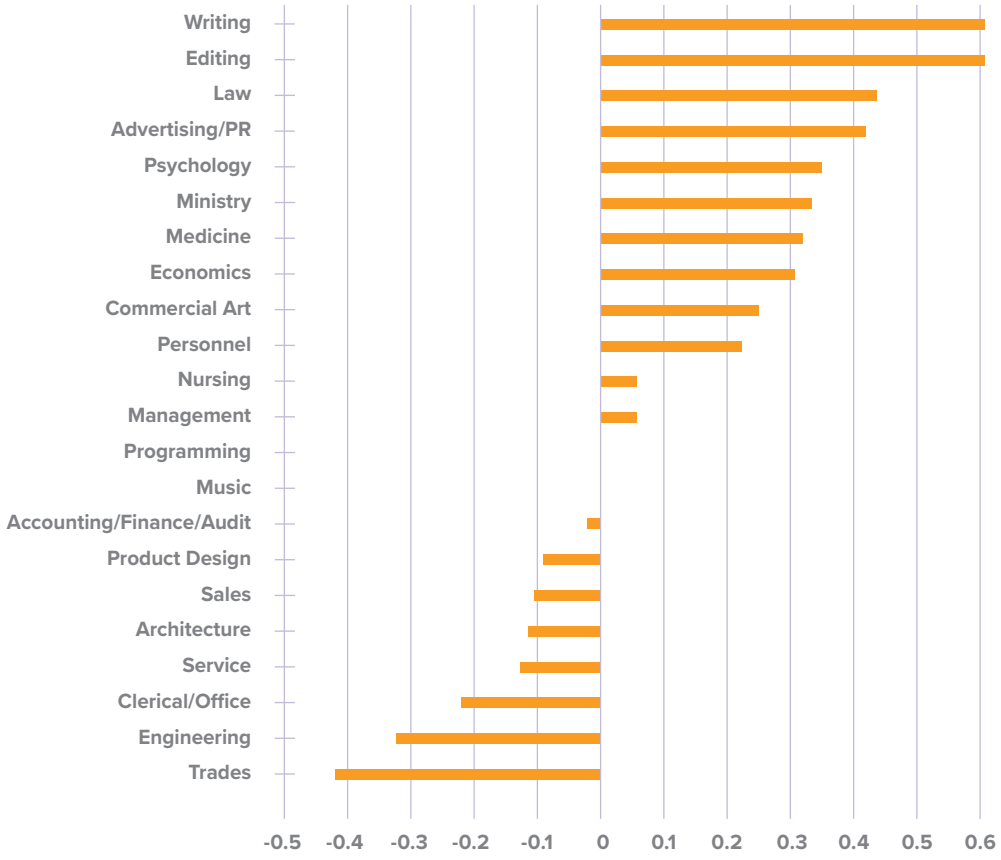
Ideaphoria measures the rate of flow of ideas. People who score high often do not have one consistent thread running through their writing. Their thoughts may be divergent, like the branches of a tree, starting in one place and ending up somewhere else entirely.

If you score high, consider fields in which a rapid flow of ideas is beneficial to your work. Communications fields like advertising, marketing, public relations, and writing all utilize a steady stream of ideas and include activities like communicating with people, developing concepts, or thinking up new methods and techniques. Brainstorming often proves extremely satisfying for those with Ideaphoria. If you are a high-Ideaphoria student, look for courses that include class discussions, essay-style tests, and presentations as part of your grade.

WHO USES IDEAPHORIA?

Our research shows that people in fields that involve brainstorming, educating, writing, persuading, and innovating often score higher on Ideaphoria.

AVERAGE Z-SCORES IN IDEAPHORIA ACROSS CAREER FIELDS



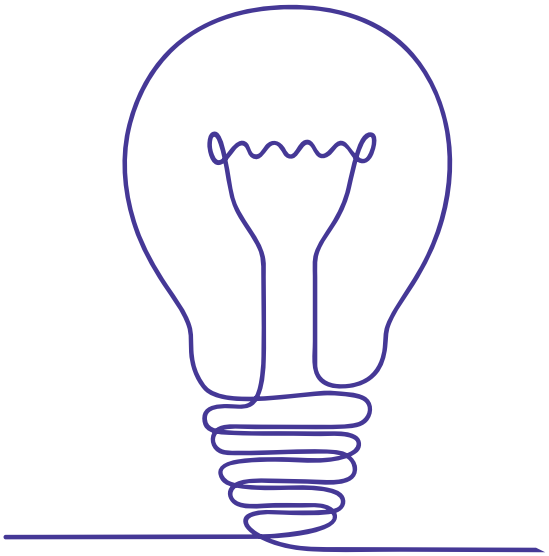
The Ideaphoria test was adapted from a "creative imagination" measure used by British researchers in the 1920s.

As a group, engineers who were lower in Ideaphoria reported higher levels of career satisfaction. Engineers who scored high in Ideaphoria were more likely to hold patents for designs and inventions.

TIPS FOR HIGH IDEAPHORIA

IN THE WORKPLACE

- Look for roles that move from project to project or require a constant influx of new ideas.
- Avoid repetition – repeating the same tasks day after day might be boring or frustrating.
- Try to take on new responsibilities and challenges.
- Consider tasks that include selling, researching and educating about new ideas, or developing new business.



IN DAILY LIFE

- Try hobbies like creative writing, blogging, tutoring, or coaching.
- Consider volunteering in fundraising, docent work, public speaking, or advocacy.
- Seek variety in your activities. Changes from the routine usually stimulate the person with Ideaphoria.

IN THE CLASSROOM

- Consider activities like newspaper and yearbook, theater and improv, or art classes.
- Look for opportunities to lead or inform: Try tutoring, student council, peer counseling, speech and debate, fundraising, advocacy, or publicity.
- If you're also spatial, consider creative outlets like set design, building floats, or 3D art and design.

USE YOUR APPROACH

COMMUNICATING AND PERSUADING

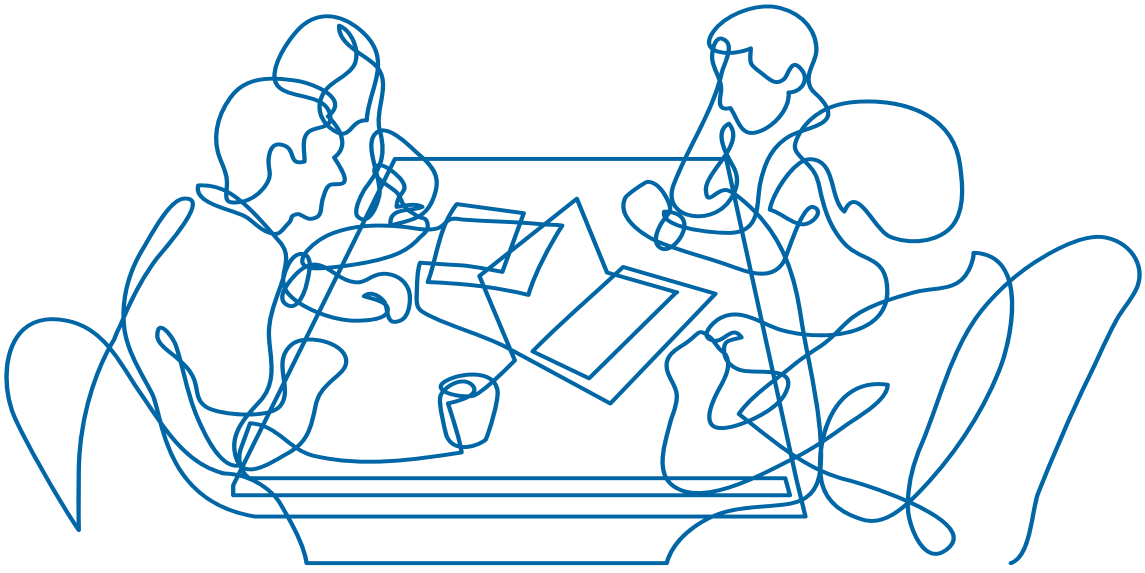
- Lead a marketing team.
- Advocate for or educate about a cause you care about.
- Write stories, music, plays, dialogue, blogs, or personal essays.
- Help craft messaging or work as a speechwriter for a political campaign.
- Pursue a career in law as an attorney, advisor, or lobbyist.

TEACHING AND INFORMING

- Create public information campaigns for a nonprofit.
- Teach in an academic setting, tutor, or provide private lessons.
- Create training materials or work in internal communications.
- Educate others as a seminar or workshop presenter.
- Coach an athletic or academic team.

BRAINSTORMING AND INNOVATING

- Create slogans as an advertising copywriter.
- Work in research and development.
- Express yourself through visual art, sculpture, or photography.
- Look for opportunities in emerging fields where new ideas will be valued.
- Develop curriculum for school districts or educational companies.



Make it Innovative

IF YOU'RE INTERESTED IN	TRY
Nonprofits	Advocacy, Fundraising, Event Planning
Business	Business Development, Sales, Marketing
Healthcare	Medicine, Public Health
Education	Curriculum Development, Teaching Humanities

IF YOU'RE INTERESTED IN	TRY
Politics	Speechwriting, Strategy, Public Relations
Technology	Video Game Design, App Development
Music	Composing, Music Production, Music Therapy
Visual Art	Graphic Arts, Art Education, Curating

MAJORS, MINORS, AND COURSES FOR IDEAPHORIA

People who score high in Ideaphoria are most engaged when they have an outlet for their ideas. When it comes to your education, look for classes that center around communication and discussion, or that will challenge you to use your ideas in your work. Even if you choose a technical major in a STEM field, use your electives to take classes in the humanities or arts. Creating your own major or choosing an interdisciplinary emphasis is a good way to get the variety that high Ideaphoria needs.

IF YOUR PATTERN IS SPATIAL

- 3D Design
- Science and Medical Illustration
- Science Filmmaking
- Film Production
- Science Communication
- 3D Art
- Animation
- Medicine
- Science, Technology, and Society
- Biotechnology and Entrepreneurship
- Genetic Counseling
- Neuroscience
- Educational Technology
- Video Game Design
- Real Estate Development
- Urban Design
- Web Design

IF YOUR PATTERN IS NONSPATIAL

- Journalism
- Marketing
- Law
- Public Relations
- Education
- Humanities
- Creative Writing
- Psychology
- Publishing
- Political Science
- Graphic Design
- Museum Studies
- Communications
- Counseling
- Media Studies
- Literature
- Mediation Studies
- Entertainment Business
- Cultural Studies
- Performing and Visual Arts
- Hospitality or Sports Management
- Entrepreneurship
- Global Affairs
- Food Studies

WHEN YOU SCORE LOW

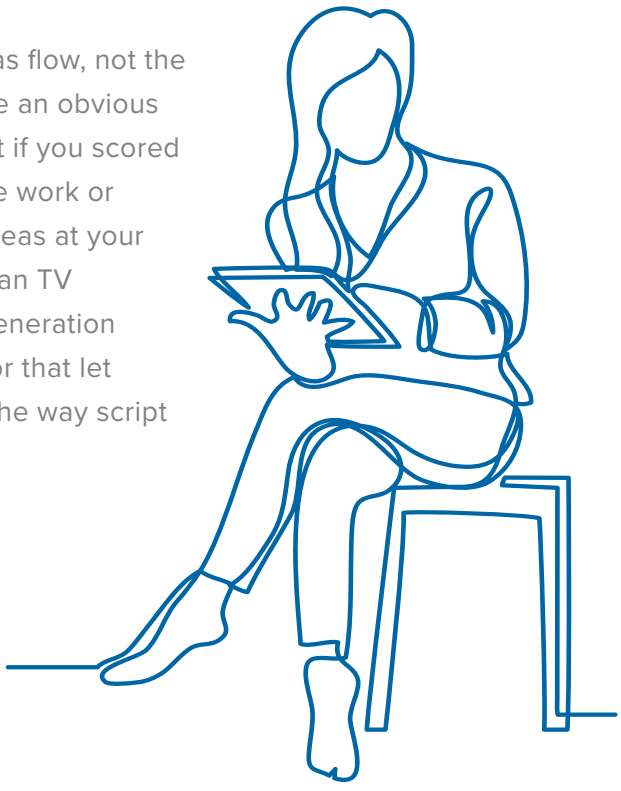
Scoring low or average on the Ideaphoria test doesn't mean you don't have any ideas, just that your ideas may not come as rapidly. A role that requires a constant stream of new ideas might be frustrating or stressful. Keep in mind that low Ideaphoria can be an asset in the right environment. We've found that low-Ideaphoria scorers are well-suited for roles where focus is the key and your success depends on having and applying knowledge in your field. We see lower scores in fields like structural trades, accounting and clerical work, some engineering fields, service occupations, and computer programming. In these fields, the high Ideaphoria approach seems to be a distraction rather than a help.

USE YOUR APPROACH:

- Avoid roles where brainstorming is key.
- Look for opportunities where being concise, precise, and research-oriented benefits the work.
- Give yourself more time to come up with ideas or content.
- Keep a running list of ideas for projects that you can use later if needed.
- Try brainstorming with others, rather than alone.

LOW IDEAPHORIA AND CREATIVITY: QUALITY OVER QUANTITY

Ideaphoria is a measure of how quickly your ideas flow, not the quality of those ideas. Creative fields can provide an obvious outlet for someone with a rapid flow of ideas, but if you scored low or average here, you can still pursue creative work or industries. Look for roles that let you generate ideas at your natural pace (think writing a screenplay rather than TV episodes); provide a jumping off point for idea generation (like commission-based art or portrait painting); or that let you work with someone else's ideas or content the way script editors, talent agents, or curators do.



03 Foresight

Goal Setting

Future Thinking

Seeing Possibilities

THE TEST

A series of abstract drawings are shown, and examinees generate possibilities about what each design reminds them of. It is one of two measures (along with the Ideaphoria test) of Divergent Thinking — thinking that occurs in a spontaneous, free-flowing, nonlinear manner.

> Foresight as a measure of future thinking stemmed from research showing that high Foresight scores were prevalent in occupations that required higher levels of education. Along with Vocabulary, Foresight has a strong correlation with educational attainment. High-Foresight examinees are more likely to earn undergraduate degrees and to pursue graduate studies.

THE APTITUDE

Foresight measures an ability to see possibilities. The test was initially created as an alternative measurement for the brainstorming ability, Ideaphoria, but further research showed that Foresight is an ability separate from idea generation. An aptitude for seeing what could be — in your future, your projects, your career, or other places — seems to create a need for setting long-term goals to work toward. One study even found that high Foresight scores correlated with greater cortical thickness in brain regions related to "thinking about one's own future" and "extracting future prospects."

FORESIGHT AS AN APPROACH

> Try This: Visualize your professional self twenty years from now. **Where do you see your career?** Now reverse engineer your path, writing down the steps you'll need to take to execute that vision.

While our studies have shown that there are occupations that correlate with high Foresight scores, the aptitude itself can be thought of as an approach to work and to planning your life in general. When you score high in Foresight, you likely see plenty of possibilities and need long-term goals to help you choose and organize all the directions you know are possible. Without long-term goals, you may feel a bit disoriented or uneasy, as if you are spinning your wheels. Many people have described going through a difficult period of reorientation after achieving what they had been working toward for a long time. Their drive is still there, but now a new goal must be found.

SETTING GOALS

Though high Foresight suggests the need for long-term goals, it does not automatically provide them. To avoid some of the frustrations that can come with not having an outlet for this aptitude, spend time thinking about what is important to you in a more general way. From those interests you might be able to distill a sense of your personal vision or long-term goals. Remember that setting goals is a process; your goals might change with time.

CHOOSING A DIRECTION

How do you choose a career direction when you see many possibilities that are equally interesting to you? It can be helpful to think of the possibilities as roads on a map: It will be difficult to choose a road if you have no destination in mind. Your "destination" is the goal you've set for yourself, which can be anything from running your own business one day to having a career that allows you to travel six months out of the year. Once you've decided upon your goal, you can better evaluate the roads in front of you and choose the one that leads you to that

destination most directly. Remember that “perfection is the enemy of progress.” You may never feel one hundred percent certain that you’re making the right decision, but knowing that you have a goal that’s informing your choice can relieve much of the anxiety around choosing.

CONSIDERING WHAT’S NEXT

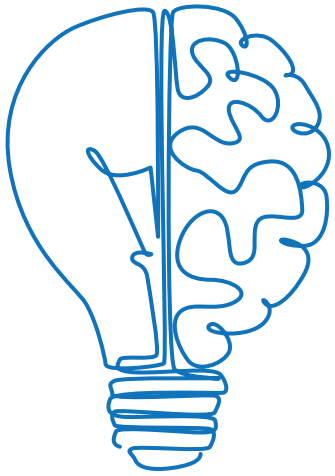
You might have noticed a pattern in your life: You set long-term goals, pursue them doggedly, and eventually tend to achieve what you set out to do. After you’ve finished your degree, sold your business, been promoted, or achieved whatever result you were working toward, you might find yourself asking “What’s next?” If this sounds familiar, think beyond a goal prior to reaching it. What will you pursue once your current goal has been accomplished? With your next goal already in mind, you can immediately begin working toward its achievement. You can also think of each goal you set as being part of a larger, overarching goal, helping you advance toward making a lasting contribution to an issue or cause that’s important to you.

MISTAKEN PERSISTENCE

People who score high in Foresight can often see a way around any obstacles in front of them and resolutely pursue the goals they’ve set for themselves. For some, that can mean going after an ambitious goal — even if it’s not the best fit overall. If you feel you’ve lost sight of why you’re pursuing a particular path, or you no longer enjoy the work you’re doing, consider a new goal that better aligns with your priorities and aptitudes. It’s not a failure to stop your progress if you’re going in the wrong direction. Don’t be afraid to refocus your goals and pursue something new that will give you a better chance of success.

FORESIGHT AS A MEASURE OF CREATIVITY

We've long known that Foresight is related to future thinking and goal setting. Emerging research indicates that thinking about future possibilities is also a component of creativity. One study in collaboration with researchers at the University of New Mexico showed that people who scored high on our Foresight test reported higher levels of creative achievement (measured through the Creative Achievement Questionnaire) and that our Foresight measurement is linked to areas of the brain associated with idea generation and creativity. This supports what outside researchers have also found: Creativity stems from an ability to imagine what could exist but doesn't yet.



USING THE FORESIGHT APTITUDE

IN THE WORKPLACE

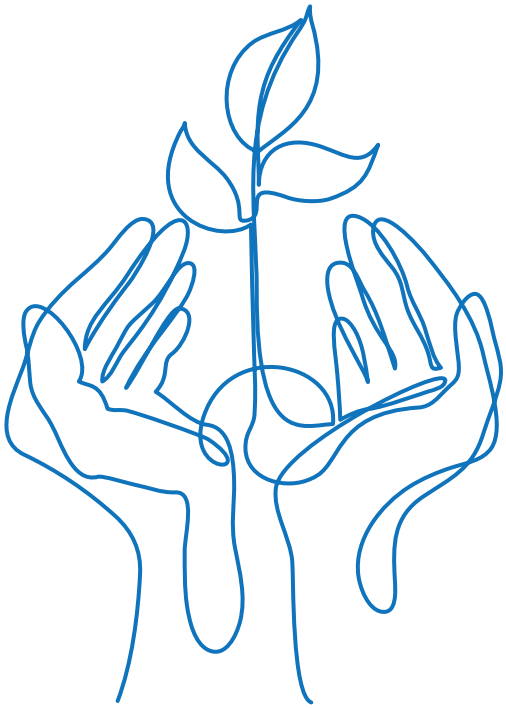
- Look for careers with room for growth so you can keep setting new professional goals.
- Work towards entrepreneurship, intrapreneurship, or leadership roles.
- Think about projects like forecasting or strategizing that let you see possibilities in the future.
- Remember that small steps in the direction of your goal can make a big difference. For example, if you want to be a musician, taking a part-time receptionist job at a music studio could lead to opportunities down the road and feel more interesting than a job that's unrelated to your goals.

IN DAILY LIFE

- Try "future self" journaling. Write about where you want to be in the next months, years, or decades.
- Take classes for personal development, or help others see possibilities by acting as a mentor. You might also like setting 30- or 100-day goal challenges for yourself.
- Become involved in local politics, working on projects now that will benefit your city for years to come.
- Stay busy in retirement or when out of the workforce. You'll likely need to feel that your efforts are directed toward a cause or goal that matters to you.

IN THE CLASSROOM

- Plan to continue your education after high school. High Foresight is correlated with more years of schooling, even for clients who score low in vocabulary.
- Don't forget that college is a time to explore. You might feel frustrated if you haven't chosen a college major or career yet. It's okay to be undeclared or change your major.
- Think about the goals you want to tackle once your formal education is completed to avoid the feeling of spinning your wheels after graduation.



Lawyers, writers, and psychologists score high in Foresight.

LOW FORESIGHT

PRESENT VERSUS FUTURE

If you score low in Foresight, you may prefer focusing on the here and now rather than something years in the future. Instead of saying, "It could be," you might be more inclined to think, "It is." Low Foresight does not mean that you never consider or worry about your future, but it can indicate that the way you motivate yourself to achieve long-term goals is different than for someone who scores high.

USE YOUR APPROACH:

- Break big goals up into smaller goals or milestones and focus on the step right in front of you. Divide long-term projects into phases.
- Measure your progress: Take the time to record your accomplishments in a work journal, make lists and cross each completed item off, or create a visual map of your journey to your future goal.
- Reward yourself when you finish a phase of your goal to stay motivated.
- Talk to someone you trust about your feelings before you give up on a goal that is beginning to feel unattainable. They might be able to help you see a way around the obstacles.

IN THE WORKPLACE

- Look for roles that provide quick feedback or turnaround for your work. You may find yourself staying motivated when you can see the results of your work quickly.
- Try your hand at project-based work. Low Foresight can be an asset in the right situation for people who are more motivated by the present than the future.
- Consider cyclical industries like education where the year is naturally divided into phases (fall, spring, summer), or freelance work environments where you accomplish your goal and then move on to a new project.

IN THE CLASSROOM

- Consult multiple sources when you're gathering information about colleges or careers. Relying on a single source might give you an incomplete picture.
- Focus on the next right step. You don't have to have your whole path mapped out before you can get started.
- Pay attention to the classes, projects, or topics that catch your attention. They could offer an interesting career or major that you might not have considered on your own.
- Look for outside input on what is possible. Talk to teachers, advisors, friends and family, employers, or coaches about the possibilities they might see for you.

AVERAGE FORESIGHT

A HYBRID PERSPECTIVE

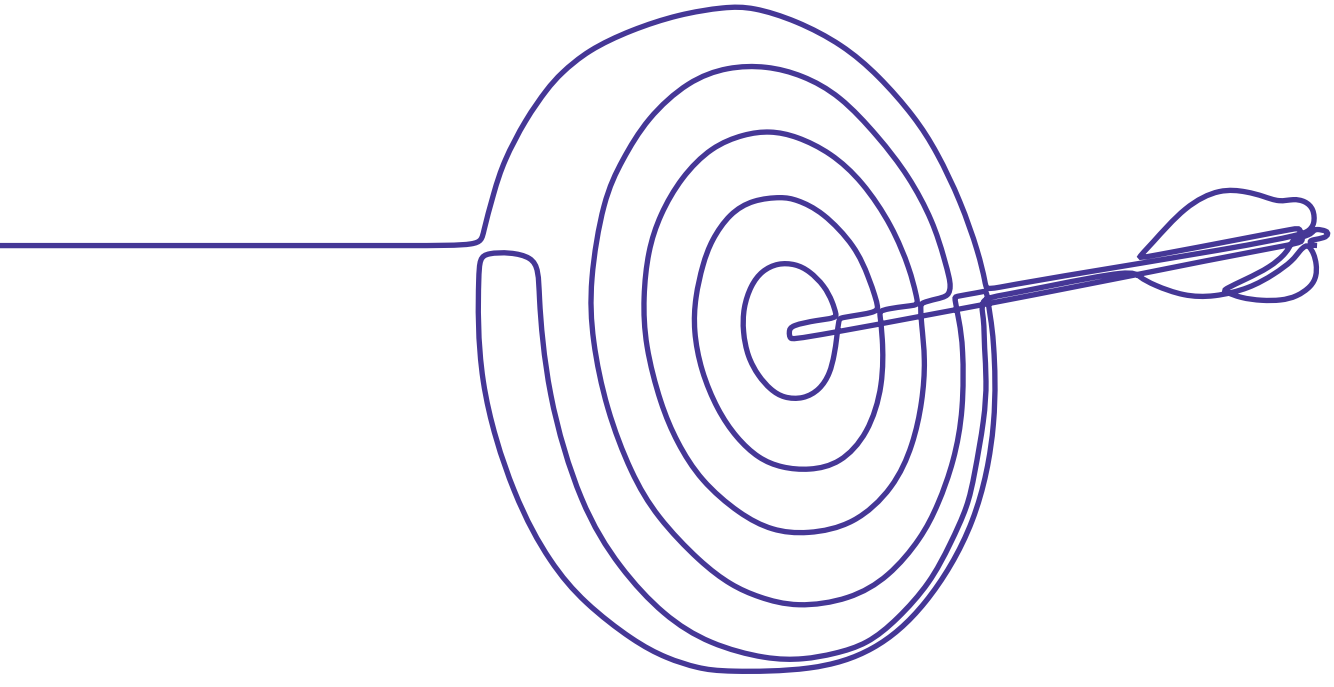
If high Foresight indicates a future-oriented approach and low Foresight indicates a present-centered approach, what does it mean when you score in the middle on this test? Some people who score average in Foresight relate strongly to one end of the spectrum or the other, but just as many find that they truly are in the middle when it comes to this ability.

The extreme ends of Foresight can have their side effects. Someone who is very high in Foresight might spend years daydreaming about a goal but never get started on it. Someone who scores very low in Foresight might dive into new projects or hobbies but quit early on. You might not struggle with thinking about the future or getting started in the present, which can be the sweet spot for accomplishing your goals.

USE YOUR APPROACH

Try bringing both high and low Foresight together. Set defined future goals for yourself, then create more specific action steps to get you there. One client who scored average in Foresight related this to his fitness journey. The distant goal of "getting healthy" felt too far away to him, but once he focused on the goal of "running a marathon," he was able to think about the specific training steps he would need to take to accomplish this goal.

Running a race can be a helpful analogy for thinking about goal setting. No matter how you score on the Foresight test, we all have and need goals to work toward. Some runners will keep themselves motivated by focusing on the finish line, while others will run from one marker to another. In the end, both approaches lead to finishing the race.



04 Inductive Reasoning

Diagnosing | Problem Solving | Connecting | Research

THE TEST

Examinees identify three pictures with something in common out of rows of six pictures. Speed is an especially important component to our understanding of this aptitude; a high scorer is able to be accurate while also moving through the items at a rapid pace. It is one of two measures (along with the Analytical Reasoning test) of Convergent Thinking — thinking that involves synthesizing or analyzing information to draw a conclusion.

THE APTITUDE

Inductive Reasoning measures the ability to make quick connections based on new information. Johnson O'Connor himself called Inductive Reasoning "the ability to sense a unifying principle running through miscellany." High scorers are often able to quickly connect the dots in any situation, and may have a knack for problem solving, diagnostic work, or investigation and research.

INDUCTIVE REASONING

A WORK APPROACH

Inductive Reasoning can be thought of as a work approach. The key is speed — clients generally answer correctly, but high scorers are able to be both accurate and fast. It's not a test where high scores correlate with many broad career fields, rather, it's an aptitude you must consider when choosing the role you want to play in a field. Doctors don't score high as a group, but emergency room doctors rely heavily on their ability to quickly assess a situation and decide on a plan of action. We can't say that all lawyers score high in Inductive Reasoning, but trial attorneys or mediators certainly need to be quick on their feet.

Cutting incisively to the real cause of a problem can also be an application of Inductive Reasoning. Though Inductive Reasoning is often defined as a diagnostic sense, it can also be a gift for critiquing, evaluating, and decision making. A theater critic with a high score in Inductive Reasoning may employ this aptitude in creating pointed critiques. A consultant might present a critical evaluation to her clients. The ability to formulate a conclusion or build a theory from a restricted number of clues is another salient feature of this aptitude. People who score high are often naturally drawn to investigative fields in which piecing together a crime, developing a case, or building a research theory requires drawing incomplete information into an accurate conclusion.

> "People who score high in Inductive Reasoning should not see their careers in terms of jobs but in terms of interesting problems to solve."
> — *Johnson O'Connor*

A high score on our Inductive Reasoning test suggests that you have the ability to think diagnostically, rapidly evaluate situations or data, and quickly solve problems. Activities that challenge this ability include advising, counseling, troubleshooting, or researching information and drawing conclusions — tasks that bring value to a wide variety of fields.

TIPS FOR HIGH INDUCTIVE REASONING

IN THE WORKPLACE

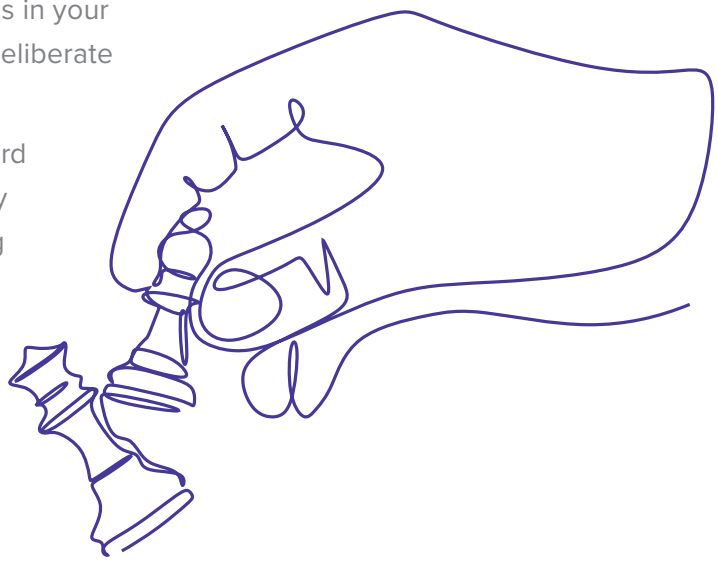
- Look for roles that let you be a decision maker, advisor, or strategist.
- Seek out new challenges and a fast-paced work environment.
- Consider which problems you'd like to spend your career solving.
- Look for fields where there are still discoveries to be made. You may feel bored if you're simply executing someone else's solutions.

IN THE CLASSROOM

- Consider extracurricular activities like debate, improvisational comedy, model United Nations (UN), peer counseling, or student government.
- Be patient when you feel your classes aren't moving fast enough. Things should get more interesting as you move away from classes that involve mainly memorization and knowledge acquisition toward upper-level work that requires more critical thinking.
- Develop good study habits and discipline. Some clients with this aptitude feel they do their best work at the last minute and have a tendency to procrastinate, which can lead to less high-quality work.
- Consider self-paced online classes that allow you to move through the material quickly.

IN DAILY LIFE

- Try hobbies like critical writing, strategy games, escape rooms, crossword puzzles, trivia, reading mysteries, or mentoring.
- Be mindful that making quick connections in your mind can lead to impatience with more deliberate thinkers.
- Watch out for turning your critical eye inward and finding the flaws in your own plans. Try working with a partner to keep you moving toward your goals.



USE YOUR APPROACH

DIAGNOSING

- Work as a therapist, clinical psychologist, or counselor.
- For 3D thinkers, consider diagnosing mechanical problems in a skilled trade or physical problems as a medical practitioner.
- Explore allied healthcare roles like occupational therapy, psychiatric nursing, or physical therapy.

EVALUATING AND TROUBLESHOOTING

- Specialize in an area of risk management — information security, large-scale project management, public health and safety, high-profile political campaigns.
- Devise marketing and business strategies for a specific industry.
- Evaluate and rate particular types of products or services for an industry publication, newspaper, magazine, or website.

RESEARCHING AND INVESTIGATING

- Educate and advise others about topics of importance to you as a consumer advocate, investigative reporter, or lobbyist for a specific subject or issue.
- For 3D thinkers, work in research and development for a tech company or in scientific research.
- Become an expert in a branch of law and advise individuals or businesses.

Solve A Problem

IF YOU'RE INTERESTED IN	TRY
Nonprofits	Consulting, Social Work, Emergency Management
Business	Marketing, Executive Work, I/O Psychology
Healthcare	ER Doctor, Crisis Counselor
Education	Education Policy, Professor, School Psychologist

IF YOU'RE INTERESTED IN	TRY
Politics	Campaign Strategy, Law, Judgeship
Technology	Research and Development in AI or VR
Music	Music Therapy, Music Cognition
Visual Art	Art Investigations, Art Therapy, Design Research

MAJORS, MINORS, AND COURSES FOR INDUCTIVE REASONING

If you scored high in Inductive Reasoning, you might especially enjoy courses and majors that have a research or investigative element to them, or that might lead to careers where you troubleshoot, solve problems, or diagnose. Think of a problem you'd like to spend your career solving and work backwards. What classes or training would you need?

IF YOUR PATTERN IS SPATIAL

- Medicine and Pathology
- Archaeology
- Neuroscience
- Psychiatry
- Human Factors Design
- Research Sciences
- Biomedical Computation
- Cybersecurity
- Product Design
- Neuroarchitecture
- Mechanics
- Forensic Science and Technology
- Air Traffic Control Studies
- Wind Turbine Technology
- Biomedical Engineering

IF YOUR PATTERN IS NONSPATIAL

- Psychology
- Marketing
- Strategic Leadership
- Social Sciences
- Law
- Philosophy and Ethics
- Criminal Justice
- Public Policy
- Comparative Studies
- Human Rights
- History
- International Affairs
- Paramedic Studies
- Diplomacy
- Investigative Reporting
- Child Development
- Mediation
- International Development
- Psychiatric Nursing

IF YOU SCORE LOW

DELIBERATE PROBLEM SOLVING

If you scored low on the Inductive Reasoning test, you may be more careful, deliberate, and methodical in reaching conclusions. When you are confronted with problems to solve in the workplace, you may prefer to take more time and have more information before making your final decisions. People who score low are often characterized by their thoroughness and accuracy. Some describe this as an insistence on quality over speed, and being pushed to work quickly may lead them to feel that things have been poorly finished or that decisions have been made too hastily. This more deliberate reasoning style and concern for accuracy are great strengths in many professions.

USE YOUR APPROACH:

- Look for work environments in which you can move at your own pace.
- Give yourself permission to take your time when making big decisions.
- Be prepared when you're entering a new situation or might be asked to think on your feet, like in job interviews or presentations.
- Seek out work that values accuracy over speed.

LOW INDUCTIVE REASONING AND DIAGNOSTIC WORK

In some ways, Inductive Reasoning is a measure of the extent to which someone feels comfortable trusting their instincts and making decisions based on them. In some branches of medicine like emergency room medicine or surgery, this is important. But there are plenty of avenues in healthcare and diagnostic work that don't depend on quick decisions. One of our clients specifically went into pediatrics, because he knew he didn't feel comfortable making life or death decisions in the moment. Similarly, someone who is interested in psychology might enjoy working as a therapist in private practice but find a crisis hotline to be too stressful an environment. Your careful and thorough approach can help you identify the type of work environment you might enjoy.

05 Analytical Reasoning

Organization and Systems

Efficiency

Planning

THE TEST

Chips with words on them are organized into a logical arrangement. It is one of two measures (along with the Inductive Reasoning test) of Convergent Thinking — thinking that synthesizes or analyzes information to draw a conclusion.

THE APTITUDE

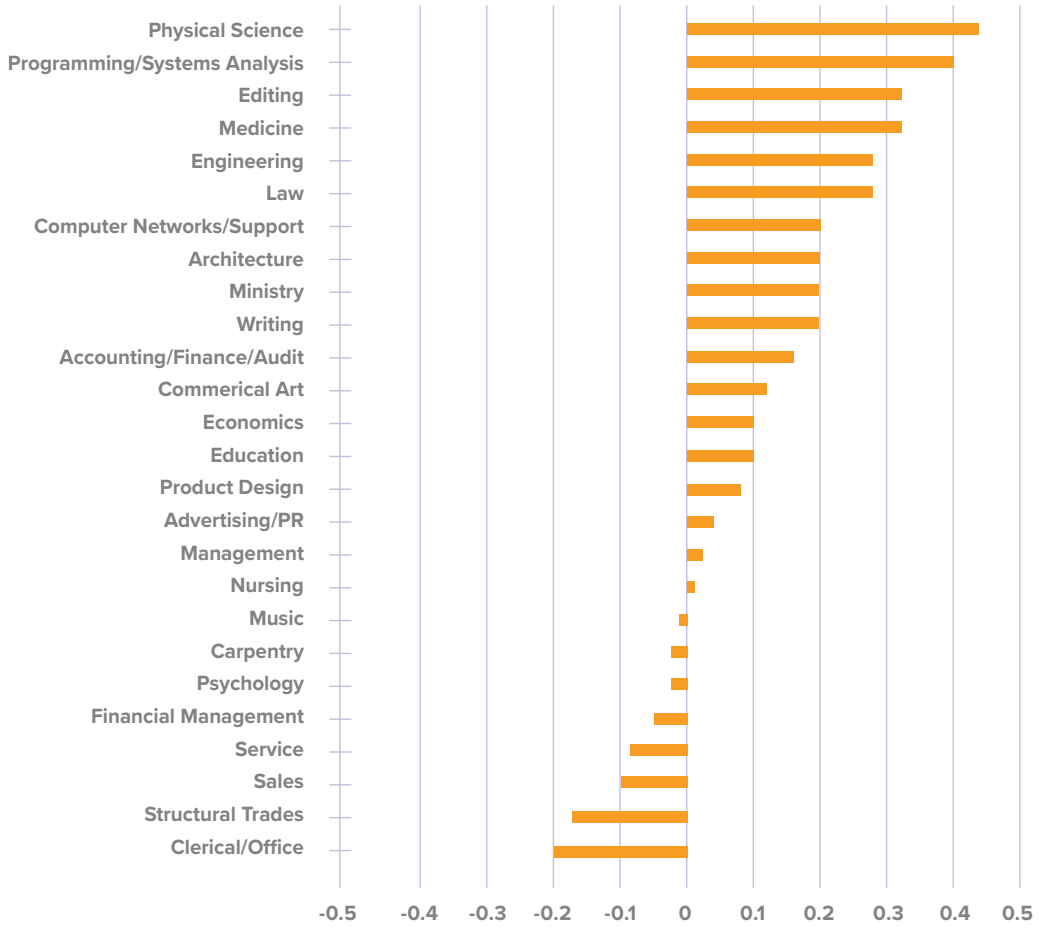
People who score high in Analytical Reasoning often demonstrate the ability to organize ideas and concepts in their minds without the use of exhaustive, step-by-step instructions. They can quickly and accurately see how the words work together, indicating comfort with challenges like creating efficient ways to do things, mapping out systems that work economically, or solving logical puzzles.

Although the test predates even the concept of modern computer software, this aptitude has been found in individuals in software engineering and computer programming. Engineers, scientists, and editors also tend to score high on this test. Analytical Reasoning may also play an important role in the work of electronics technicians, accountants, computer professionals, actuaries, physicians, and teachers. The common thread is work that requires the ability to select and organize relevant information for the solution of a problem.

WHO USES ANALYTICAL REASONING?

Those working in jobs that rely on logic and organization tend to use this aptitude the most. The aptitude was named after the fact that careers like science, engineering, and law are analytical by nature.

ANALYTICAL REASONING



Analytical Reasoning is highly correlated with grades in a variety of course areas, including mathematics, natural sciences, and economics.

Analytical Reasoning was significantly related to graduation rates in a study of engineering majors at the University of Texas. Nearly 60% of high-scoring students made it to graduation, vs. about 35% of low-scoring students.

TIPS FOR HIGH ANALYTICAL REASONING

IN THE WORKPLACE

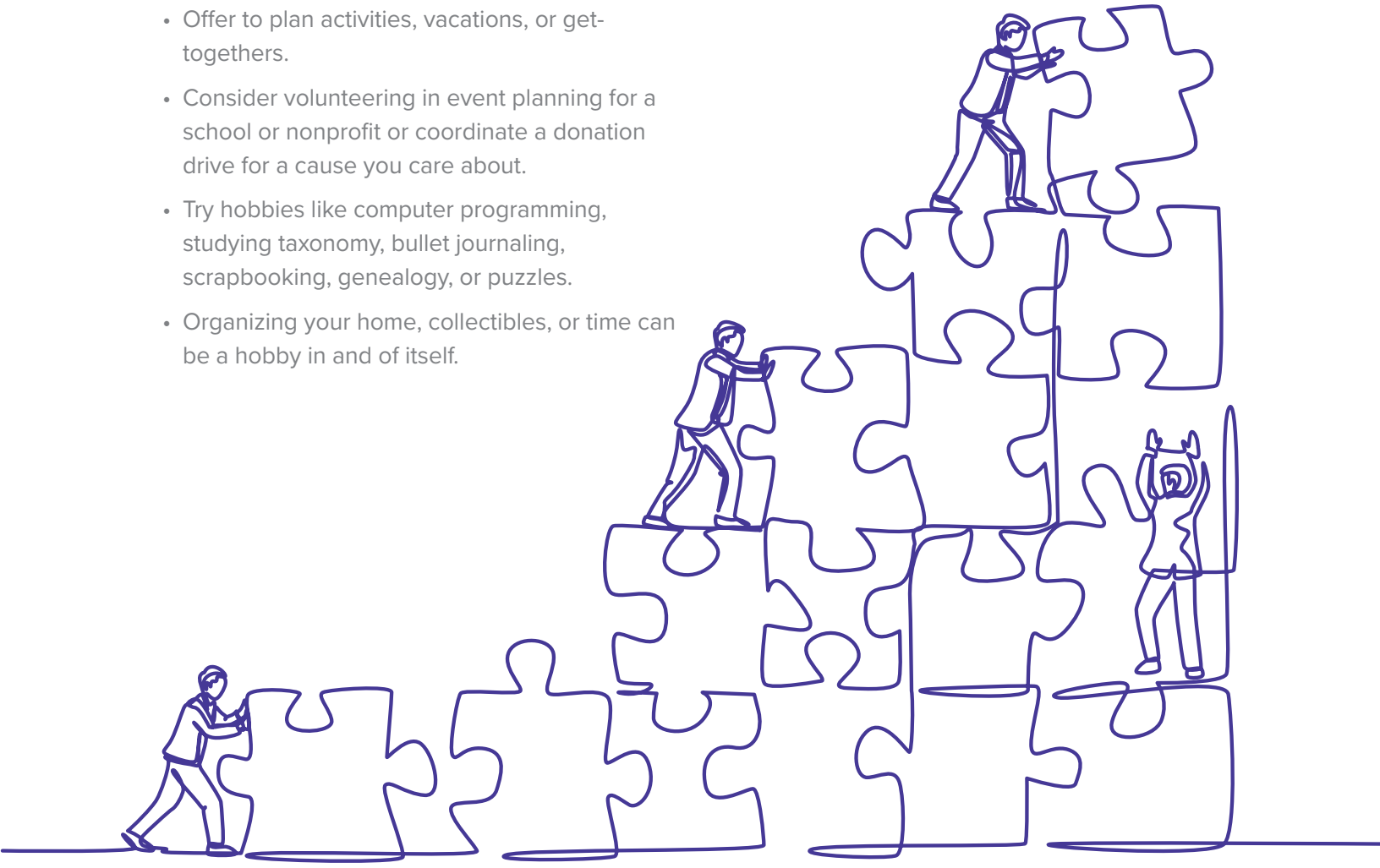
- Look for projects to manage and streamline. Run meetings to keep them moving on time.
- Edit the company newsletter or organize team-building or office social activities.
- Look for environments where you have the freedom to improve operations. You might be frustrated when you can see a more efficient way to work.

IN DAILY LIFE

- Start a side business as a personal organizer, virtual assistant, or productivity consultant.
- Offer to plan activities, vacations, or get-togethers.
- Consider volunteering in event planning for a school or nonprofit or coordinate a donation drive for a cause you care about.
- Try hobbies like computer programming, studying taxonomy, bullet journaling, scrapbooking, genealogy, or puzzles.
- Organizing your home, collectibles, or time can be a hobby in and of itself.

IN THE CLASSROOM

- Consider activities like newspaper or video editing, leadership or historian roles in clubs or student government, or coordinating social or sporting events for your school.
- If you're also spatial, take classes in user experience design, web design, or computer programming. Join a robotics or technology club.
- Share your organized approach to studying by volunteering as a tutor or homework helper.



USE YOUR APPROACH

PLANNING

- Plan events in fundraising, marketing, or hospitality.
- Set and coordinate schedules as a travel agent or executive assistant.
- Work as an activities director for a museum or after-school program.
- Help others plan their financial futures, college experiences, or careers as a financial planner, college consultant, or career counselor.

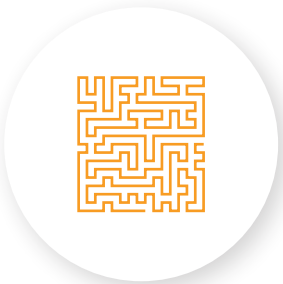
ORGANIZING

- Become a personal organizer, small business consultant, or productivity coach.
- Structure information as a book or video editor or technical writer.
- Pursue a career in project management or clinical data management.
- Create or teach classification systems in science, linguistics, or archival work.
- Help students organize their studying as an executive functioning consultant.

SYSTEMS AND EFFICIENCY

- Streamline manufacturing operations as an industrial engineer.
- Help companies improve their processes as a management consultant, industrial-organizational psychologist, or efficiency expert.
- Develop and design technology solutions as a systems analyst.
- Work as a logistician in supply chain planning and management systems.

Make It Organized



IF YOU'RE INTERESTED IN	TRY
Nonprofits	Grant Writing, Event Planning
Business	Project Management, Logistics
Writing	Editing, Technical Writing
Education	Curriculum Design, Administration
Politics	Campaign Management, City Planning
Technology	Programming, UX Design, IT
Visual Art	Video Editing, Infographic Design

MAJORS, MINORS, AND COURSES FOR ANALYTICAL REASONING

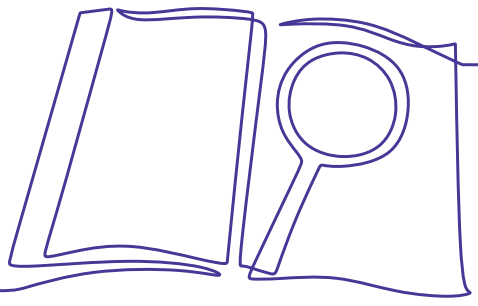
The Analytical Reasoning aptitude can be useful in almost any class or industry, so you might not have to seek out a way to use it. If you scored high in this area and get satisfaction out of applying order to problems or information, consider these courses and majors.

IF YOUR PATTERN IS SPATIAL

- Computer Science and Programming
- Engineering
- UX Design
- Information Systems
- Cyber Security
- Physical Sciences
- Medical Science
- Bioinformatics
- Genetics
- Engineering Technology
- Aircraft Mechanics
- Cryptography
- City and Urban Planning
- Actuarial Science
- Operations Research

IF YOUR PATTERN IS NONSPATIAL

- Editing and Publishing
- Organizational Psychology
- Sociology
- Event Planning
- Library Science
- Archival Studies
- Educational Administration
- Education
- Nursing and Allied Health
- Healthcare Management
- Business Intelligence
- Project Management
- Financial Planning
- Operations Management
- Human Resources
- Legal or Paralegal Studies
- Video Editing
- Supply Chain Management



IF YOU SCORE LOW

A low score in Analytical Reasoning doesn't mean you can't be organized or make plans, just that it might take more time or a deliberate effort to get there. For example, students who score low might start projects early in order to have more time to organize their thoughts. A working adult might ask a coworker or friend to help with editing a presentation. Either group might benefit from an outline or other framework to help them streamline their thoughts. You might find it helpful to develop organizational strategies and habits to keep yourself organized at school or work. People who score low often think of themselves as super-organized since they are especially capable of relying on external order like day planners or calendars.

Try to avoid roles or situations where it's your responsibility to create systems or organize people. You may be more comfortable when you can rely on existing systems and your other aptitudes to accomplish your goals.

USE YOUR APPROACH:

- Take time at the beginning of a project to think through it entirely, so you aren't overwhelmed with surprise situations later.
- Try bookending your day: Make a plan at the beginning and revise it at the end to prepare for the next day.
- Make lists and prioritize your tasks. Accomplish the highest priority items first.
- Use productivity and organizational apps and systems to keep yourself on track.

LOW ANALYTICAL REASONING AND "LOGICAL THINKING"

Clients sometimes worry that a low score in Analytical Reasoning means they lack the ability to reason logically, but a low score here simply indicates that you took more time putting your answers down and might also prefer more time to organize your work or ideas. Structuring your thoughts with an outline before you write a paper is a good example of this. You might also prefer to approach a problem in a way that capitalizes on your other aptitudes. If you're constantly being asked to solve problems like an engineer does, it could feel a little rigid to your mind.

06 Numerical Aptitudes

Data and Analytics

Business

Mathematics

THE TESTS

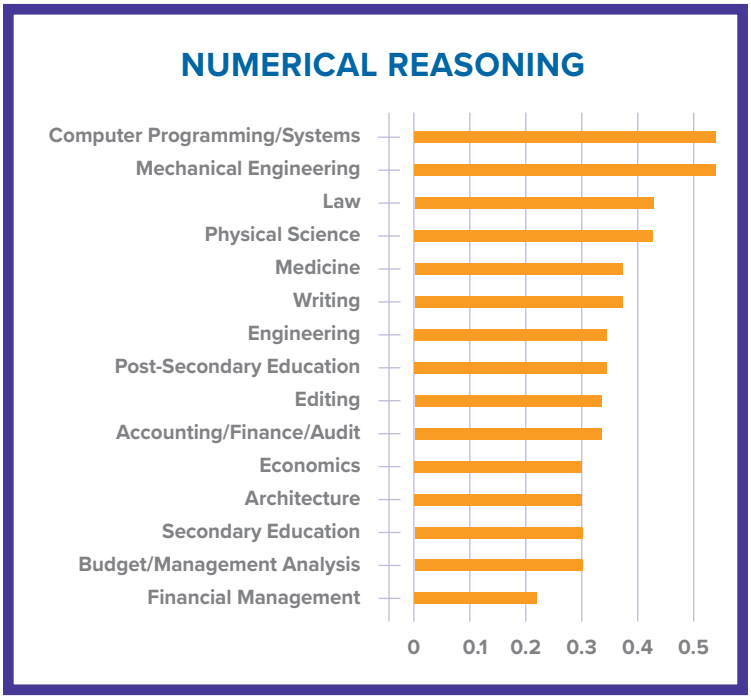
The three numerical tests we administer measure three separate and distinct abilities. Scoring high on one or two of them doesn't mean you'll score high on all three. The combination of your scores on these tests can indicate the nature of the talent you have with numbers.

- **Numerical Reasoning** Sets of seven numbers are arranged according to a particular pattern. Examinees determine what the next number in the pattern would be.
- **Number Facility** Six chips with numbers on them are arranged to complete two equations.
- **Number Memory** Examinees must remember a series of six-digit numbers shown in four separate trials.

NUMERICAL REASONING

THE APTITUDE

Numerical Reasoning measures the ability to find trends or patterns in numbers. Being able to see connections between numbers is useful in fields that involve analyzing, interpreting, or reasoning with numerical information. Scoring high indicates a strength in problem solving with numbers, applying them to real-world situations, using them to tell a story, or to predict and forecast. Someone who works in statistics, financial analysis, accounting, auditing, budgeting, market research, cost estimating, mathematics, economics, or demography would use this aptitude.



Numerical Reasoning tests have been used over the years in a number of intelligence and aptitude batteries, including IBM's Programmer Aptitude Test. Computer programmers we've studied score high on our Numerical Reasoning test as well.

As a group, attorneys also score high here. Numerical Reasoning seems to be connected to general reasoning.

IF YOUR PATTERN IS SPATIAL

- Engineering
- Computer Science
- Physics and Chemistry
- Medicine
- Data Science
- Actuarial Work
- Biostatistics
- Epidemiology

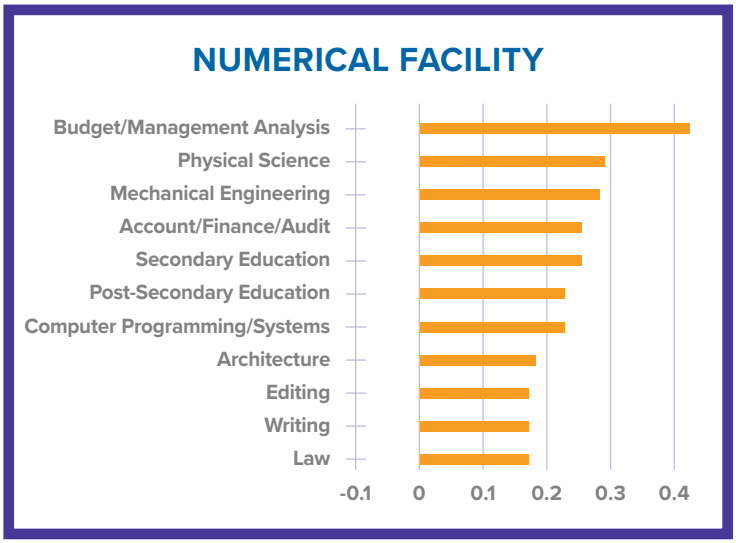
IF YOUR PATTERN IS NONSPATIAL

- Market Research
- Finance or Accounting
- Law
- Social Sciences
- Math Education
- Public Policy
- Statistical Analysis

NUMBER FACILITY

THE APTITUDE

Number Facility measures the ability to do arithmetic quickly and accurately in your head. It is used in a wide variety of occupations, but is particularly useful for those who must perform arithmetic operations on a routine basis like bookkeepers, accountants, salespeople, bankers, or cost estimators. It is a helpful support in most business settings (having to give a quick estimate, calculate a percentage, etc.) and is likely the mathematical ability you use most in your day-to-day life.



Number Facility is a measurement of quick mental math and is unrelated to organizing and understanding mathematical problems. It does, however, still play a role in most number-heavy fields.

USING NUMBER FACILITY – AN EVERYDAY ABILITY

IN CAREERS

- Accounting
- Auditing
- Math Education
- Budget Analysis
- Banking
- Administration
- Personal Finance
- Purchasing

IN DAILY TASKS

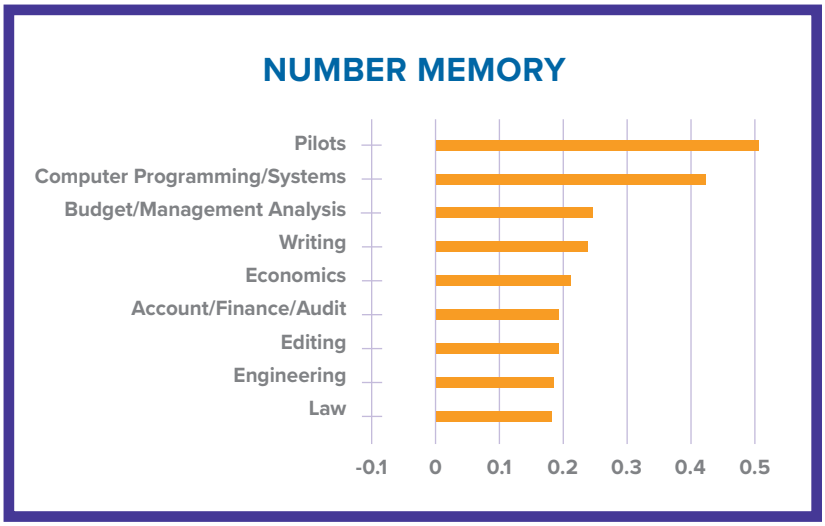
- Tallying figures for a client at work.
- Scoring tests or quizzes as a teacher.
- Tracking your household budget.
- Converting currency when overseas.
- Modifying measurements in recipes.
- Calculating a tip at a restaurant.
- Estimating material costs for a craft or home improvement project.

> For decades, Number Facility tests have been used as a cognitive ability measurement in studies related to aging and learning.

NUMBER MEMORY

THE APTITUDE

Number Memory measures the ability to naturally remember numbers or groups of numbers, like phone numbers, sports statistics, or addresses. Professionals who work with numbers, like accountants, bankers, and engineers, tend to score higher than average in this aptitude. We have also found that pilots score high — the ability to quickly and accurately remember numbers helps them keep up with data on air speed, atmospheric pressure, and altitude.



> Writers and editors tend to score as high as or higher than economists and engineers, possibly because Number Memory has a moderate correlation with our Word Memory test (Silograms).

USING YOUR NUMBER MEMORY

High memory scores can be useful if you work with numbers or data, but if you score lower on our Number Facility or Numerical Reasoning tests, you might want to think of this ability more as a bonus in your pattern than as the focus.

Consider other ways number memory might come into play outside of math-heavy careers:

- As a history teacher or researcher remembering important dates.
- For sports broadcasters and journalists reporting on statistics and team records.
- When remembering formulas in math classes.
- As an executive assistant or office manager remembering dates, addresses, and phone numbers.
- When doing a presentation that involves data.
- When keeping track of WiFi passcodes, PIN numbers, or credit card numbers.

NUMERICAL APTITUDES WHEN YOU “HATE” MATH

If you scored high on one or all of our numerical aptitude tests, you might have wondered: “How can I work with numbers when I don’t like math?”

There are all kinds of reasons why someone might score high on an aptitude test for numerical reasoning but feel a disconnect between that score and their real life experiences working with numbers. There’s even an official name for what you might have experienced: “mathephobia,” which is general anxiety and fear around mathematics.

Aptitudes predict potential, but they cannot always compensate for ineffective teaching. For many clients who hate math, that experience started years ago when they were first learning the subject. If you feel like you've had less than stellar learning situations or other experiences that caused you to fall behind, it might be worth giving a number-related class another shot in an accepting environment. That could mean taking a statistics class at a community college or trying out some business math courses through an online learning platform. We've even had clients relearn math from the very beginning through online videos.

> In these fields you’ll likely make data-driven decisions or find yourself explaining data to someone else. Numerical analysis will serve as a means to an end rather than the central focus of your work.
>
> - Law
> - Marketing
> - Sociology
> - Anthropology
> - Business
> - Politics
> - Education
> - Journalism
> - Psychology
> - Consumer Science

For other people, their dislike of math might be connected to other scores in their aptitude pattern. People who score high in Ideaphoria and numerical abilities, for example, might find algebra a little dry or can’t imagine working as an accountant. They should prioritize their rapid flow of ideas and use their numerical abilities in a secondary way in order to find the best career match. There’s also the difference between math like algebra or statistics and spatial math like calculus and trigonometry to consider. Someone who is high in Numerical Reasoning but very low in Structural Visualization might find upper-level math classes harder than they expected.

The good news is that data matters now more than ever, so your inherent ability to work with numbers can be used in a broad variety of fields.

Make It Numerical

IF YOU'RE INTERESTED IN	TRY
Law Enforcement	Cyber Security, Cryptanalysis, Forensic Accounting
Business	Finance, Marketing, Actuarial Work
Healthcare	Public Health, Nursing Informatics, Pharmacy
Writing	Finance Writing, Technical Writing

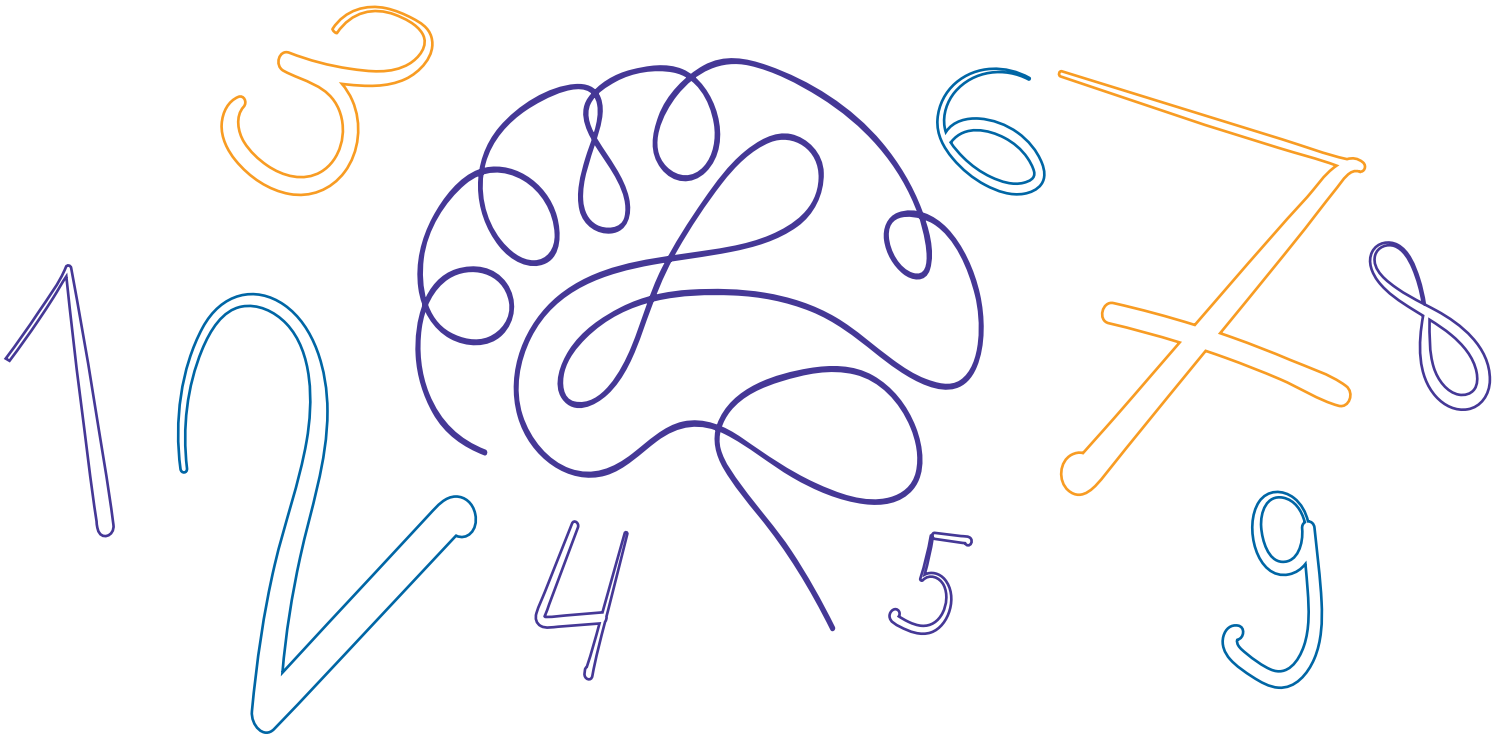
IF YOU'RE INTERESTED IN	TRY
Law	Estate Law, Corporate Law
Technology	Data Science, Venture Capital
Science	Biostatistics, Industrial Ecology, Physics
Psychology	I/O, Experimental, or Quantitative & Measurement Psychology

LOW GRAPHORIA AND NUMERICAL APTITUDES

If you score low on the Graphoria test but have other numerical aptitudes, try to keep paperwork and data entry to a minimum. Look for roles that let you focus on problem solving, analyzing, and calculating with numbers, but that leave the record keeping and accounting to someone else. Using a computer to generate and keep track of numbers can make the clerical aspects of business or technical subjects generally far less time-consuming.

One of our clients was working as an analyst for an investment firm when he came in for testing. He liked working with numbers and scored high on the numerical tests, but he also scored low on the Graphoria test and felt he was prone to making small paperwork errors in his job. He made the switch to business development, which capitalized on his numerical talent and business background but allowed him to focus more on relationship-building and strategy.

Slow clerical speed shouldn't deter someone who performs well on the numerical aptitude tests from considering a numerical field. Find ways to think about and explain numbers rather than merely notating and checking columns of numbers. Balance time on the computer with time spent on other tasks — as a financial advisor, a math or finance teacher, or someone who gives tax information seminars. These jobs involve clerical work — filling out forms, grading papers — but also involve working with numbers in other ways.



MAJORS, MINORS, AND COURSES FOR NUMERICAL APTITUDES

Numbers play a significant role in almost every field now. If you scored high on our numerical tests, pick up some math-oriented courses or choose a numbers-heavy minor. Remember that some college STEM and statistics programs require four years of high school math.

IF YOUR PATTERN IS SPATIAL

- Engineering and Engineering Technology
- Physics
- Chemistry
- Epidemiology
- Mathematics
- Data Science
- Actuarial Science
- Environmental Economics
- Astronomy
- Biostatistics
- Cryptography
- Cost Estimating
- Real Estate Development
- City and Urban Planning

IF YOUR PATTERN IS NONSPATIAL

- Finance
- Statistics
- Economics
- Business
- Accounting
- Social Sciences
- Math Education
- Financial Planning
- Auditing
- Nutrition
- Public Health
- Operations Management
- Consumer Studies
- Social Media Analytics
- Market Research
- Data Journalism
- Sports Analytics