

# Choosing Intelligently

A Practical Guide  
To Using Your Aptitudes



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of the

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**Human Engineering Laboratory, Inc.**

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April 2021



[www.jocrf.org](http://www.jocrf.org)



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

*Johnson O'Connor*

# Choosing Intelligently



Johnson O'Connor  
Research Foundation, Inc.  
Human Engineering  
Laboratory, Inc.

## TABLE OF CONTENTS

	Introduction	<b>07</b>
<b>01</b>	Structural Visualization	<b>11</b>
<b>02</b>	Ideaphoria	<b>22</b>
<b>03</b>	Foresight	<b>29</b>
<b>04</b>	Inductive Reasoning	<b>35</b>
<b>05</b>	Analytical Reasoning	<b>42</b>
<b>06</b>	Numerical Aptitudes	<b>49</b>
<b>07</b>	Auditory Aptitudes	<b>57</b>
<b>08</b>	Visual Aptitudes	<b>65</b>
<b>09</b>	Silograms	<b>77</b>
<b>10</b>	Graphoria	<b>81</b>
<b>11</b>	Dexterity Aptitudes	<b>87</b>
<b>12</b>	Grip	<b>91</b>
<b>13</b>	Workplace Personality	<b>96</b>
<b>14</b>	Vocabulary	<b>106</b>
<b>15</b>	Interests	<b>109</b>
	Closing Thoughts	<b>111</b>



## INTRODUCTION

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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

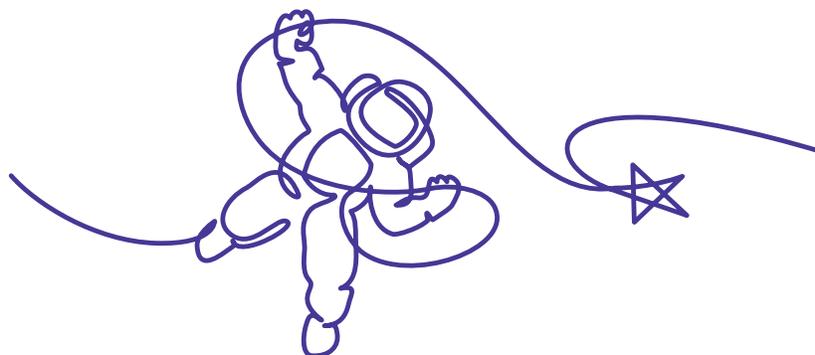
of several. When examining these issues, O'Connor observed that some of the traits that were measured seemed applicable to more than one job. If they isolated traits common to many fields, it would reduce the number of needed work samples. Thus, by taking only twenty tests, one might, in essence, sample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

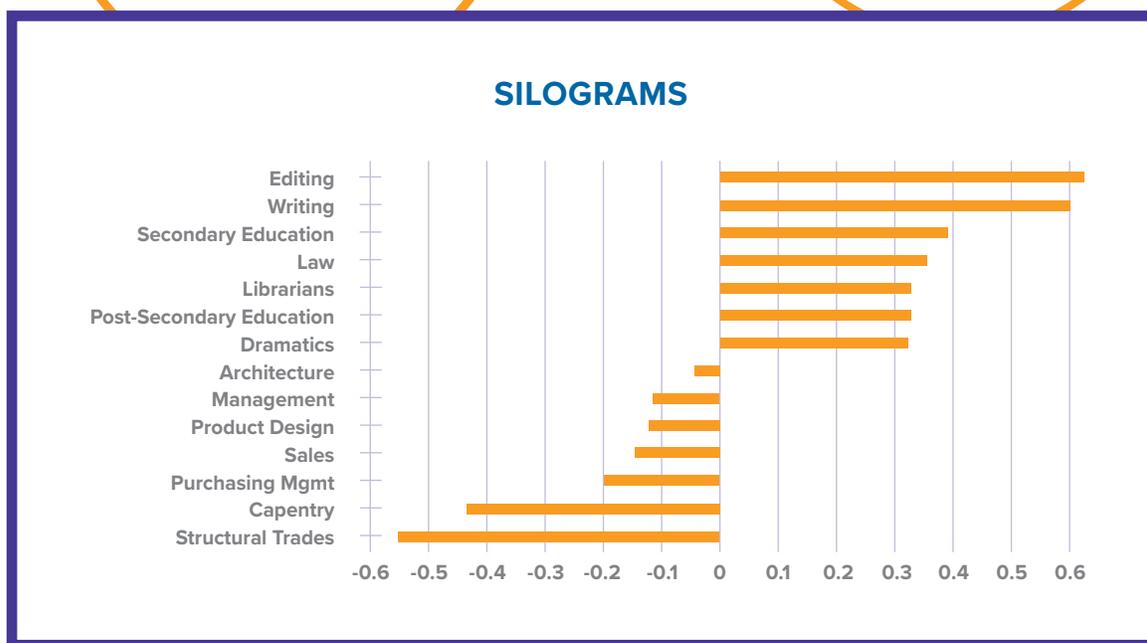


# INTERPRETING THE DATA

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.



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

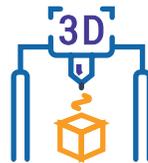
## Structural Visualization



Science



Technology



3D Thinking



Building

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### THE TESTS

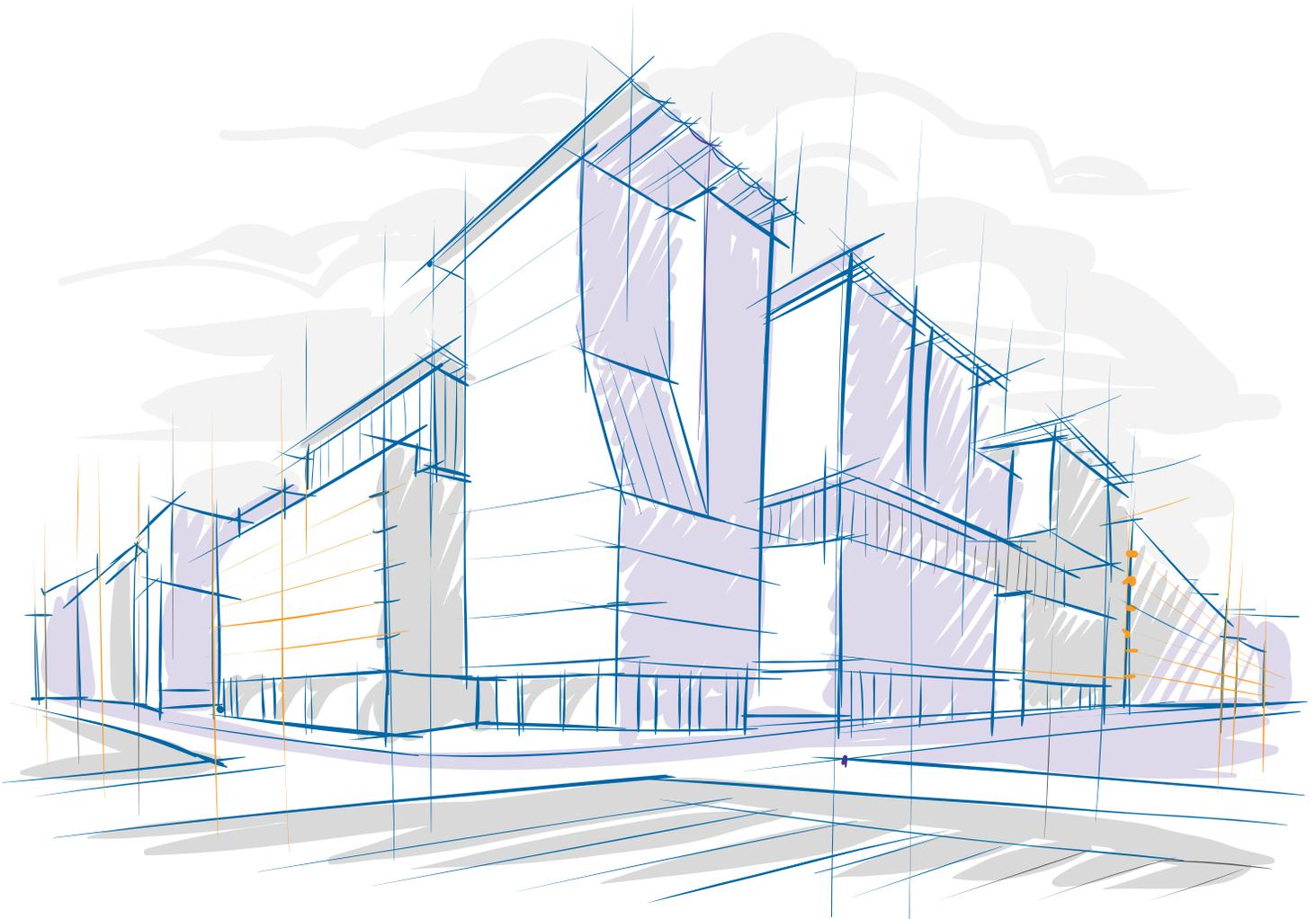
The Structural Visualization score is a composite of scores on two different tests. We measure this aptitude in two ways to increase the statistical reliability of the score.

- ✓ **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.

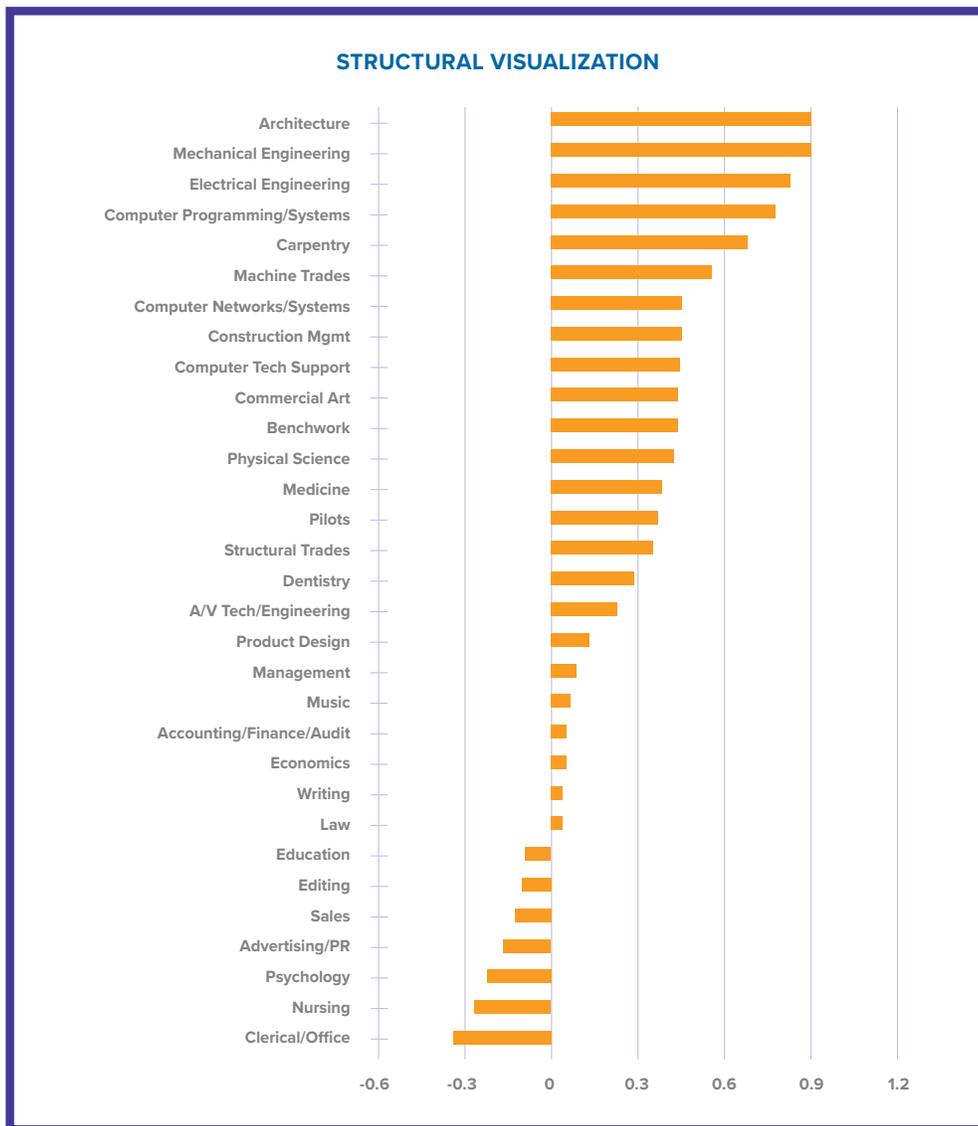
From a young age, people who score high on our tests of Structural Visualization are often drawn to taking things apart and putting them back together, building things, designing things, and figuring out how things work. Three-dimensional thinkers frequently enjoy having a tangible outcome for their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



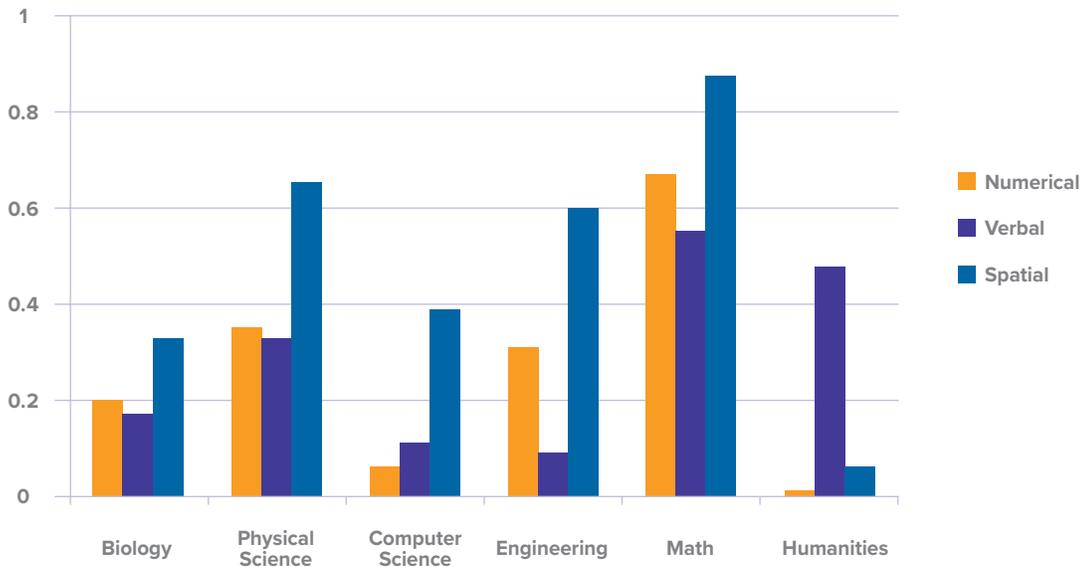
# WHO USES STRUCTURAL VISUALIZATION?

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

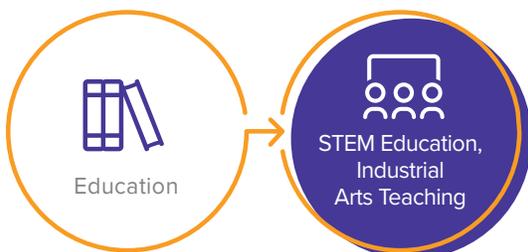
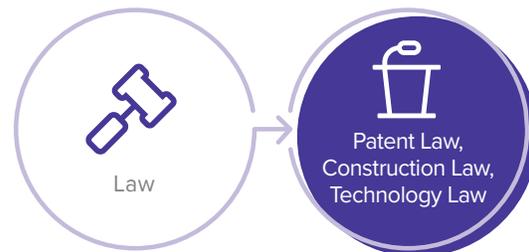
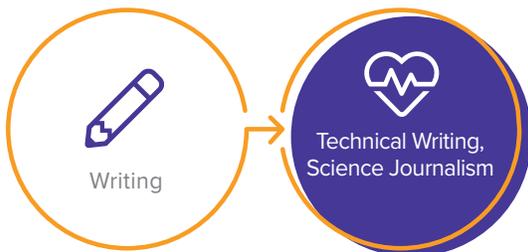
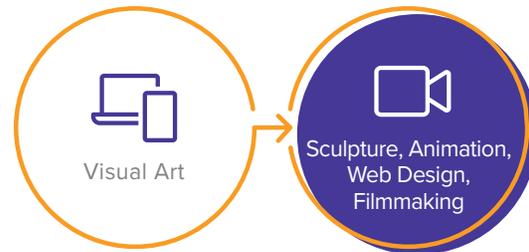
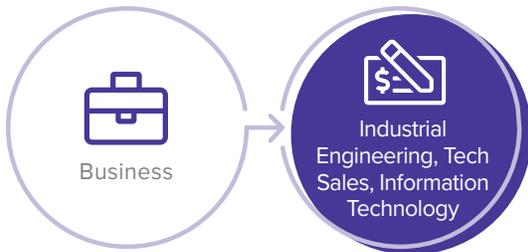
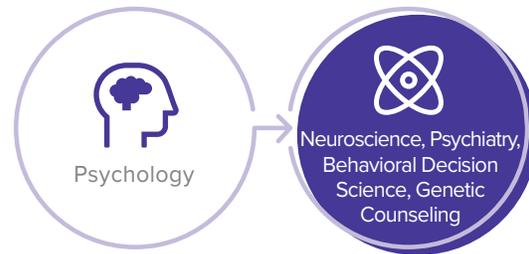


IF YOU'RE  
INTERESTED IN

TRY

IF YOU'RE  
INTERESTED IN

TRY



## 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.

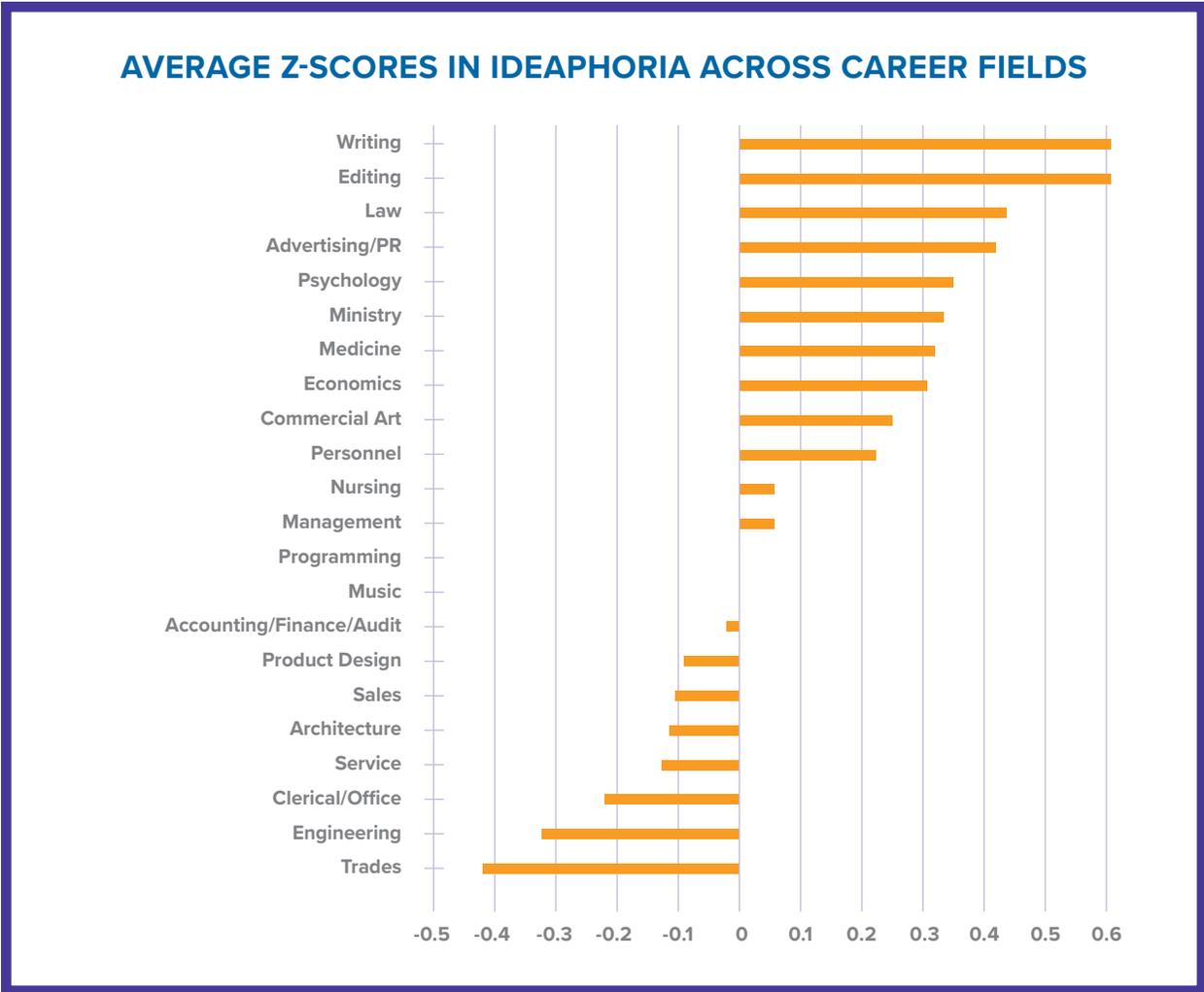
### THE APTITUDE

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.



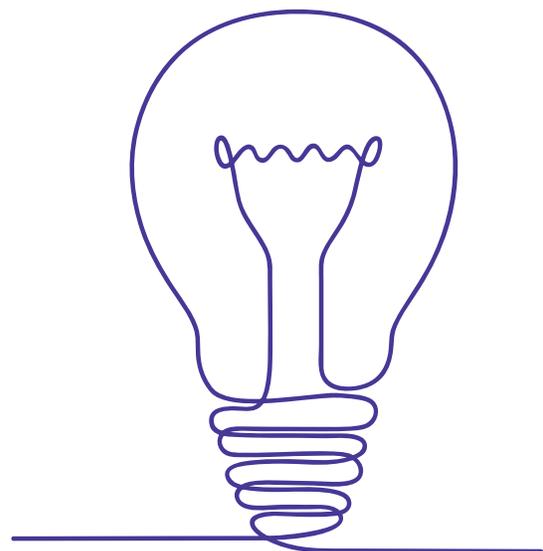
The Ideaphoria test was adapted from a “creative imagination” measure used by British researchers in the 1920s.

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 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.

## 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.



# 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

IF YOU'RE  
INTERESTED IN

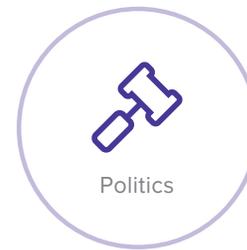
TRY



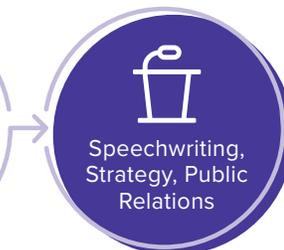
Nonprofits



Advocacy,  
Fundraising,  
Event Planning



Politics



Speechwriting,  
Strategy, Public  
Relations



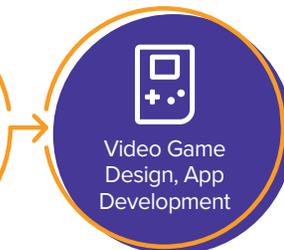
Business



Business  
Development,  
Sales,  
Marketing



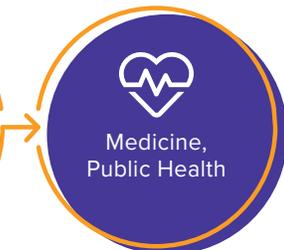
Technology



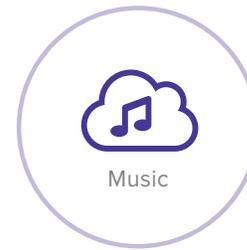
Video Game  
Design, App  
Development



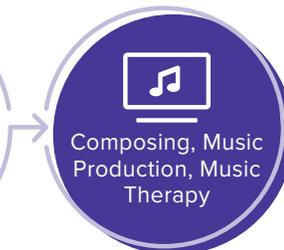
Healthcare



Medicine,  
Public Health



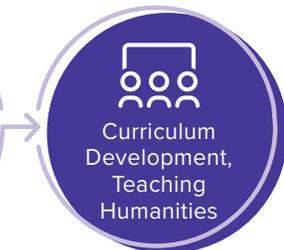
Music



Composing, Music  
Production, Music  
Therapy



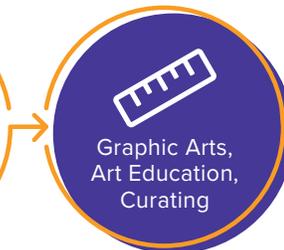
Education



Curriculum  
Development,  
Teaching  
Humanities



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

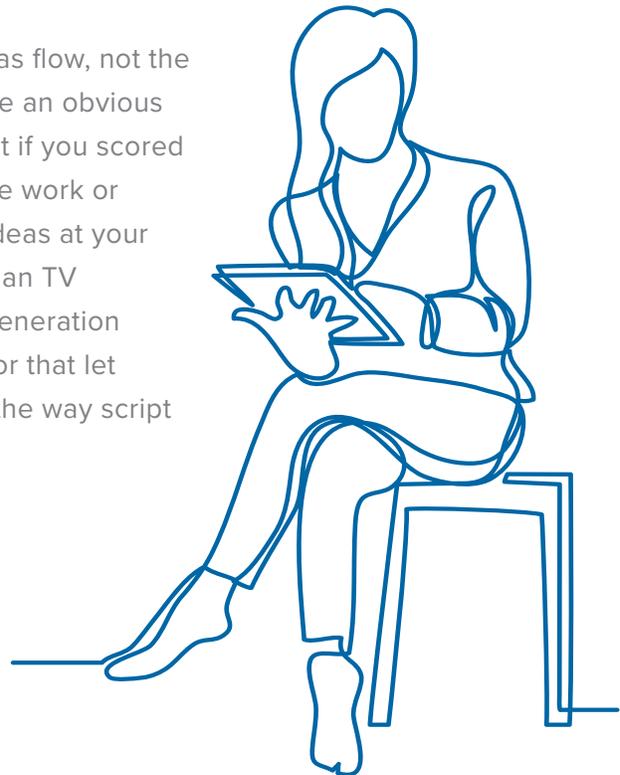
Scoring low or average on the Ideaphoria test doesn't mean you don't have any ideas, just that your ideas may not come as rapidly. A role that requires a constant stream of new ideas might be frustrating or stressful. Keep in mind that low Ideaphoria can be an asset in the right environment. We've found 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

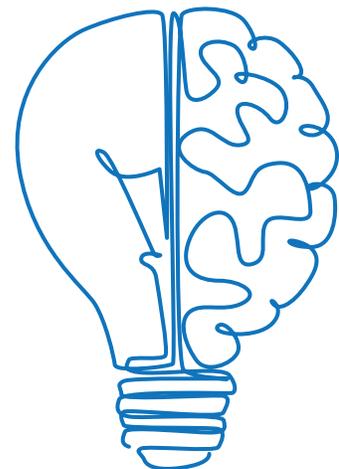
You might have noticed a pattern in your life: You set long-term goals, pursue them doggedly, and eventually tend to achieve what you set out to do. After you’ve finished your degree, sold your business, been promoted, or achieved whatever result you were working toward, you might find yourself asking “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

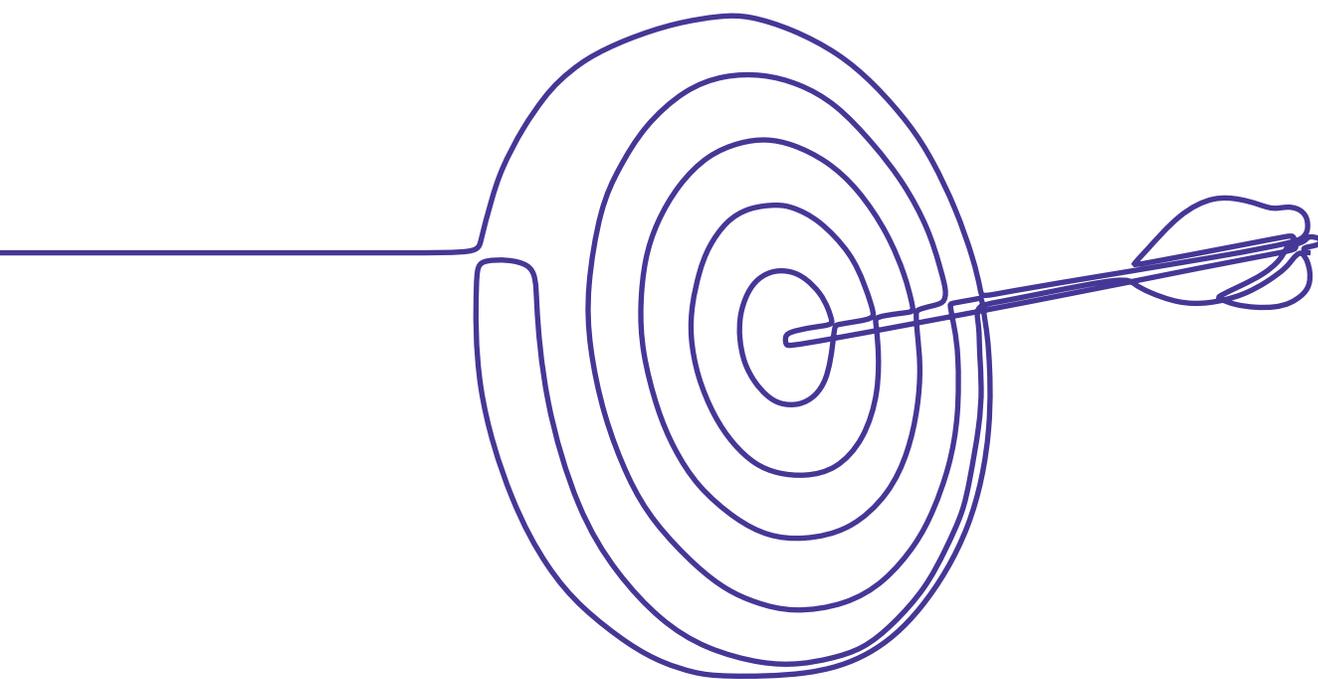
If high Foresight indicates a future-oriented approach and low Foresight indicates a present-centered approach, what does it mean when you score in the middle on this test? Some people who score average in Foresight relate strongly to one end of the spectrum or the other, but just as many find that they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

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### 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.

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.

“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*

# TIPS FOR HIGH INDUCTIVE REASONING

## IN THE WORKPLACE

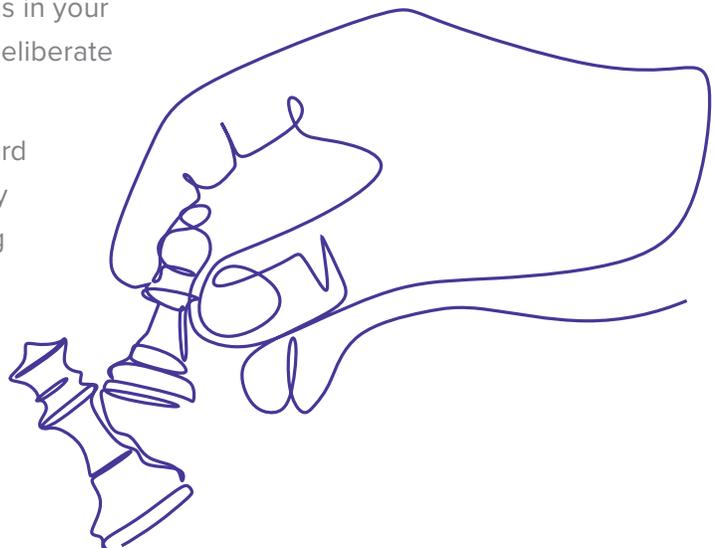
- Look for roles that let you be a decision maker, advisor, or strategist.
- Seek out new challenges and a fast-paced work environment.
- Consider which problems you'd like to spend your career solving.
- Look for fields where there are still discoveries to be made. You may feel bored if you're simply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

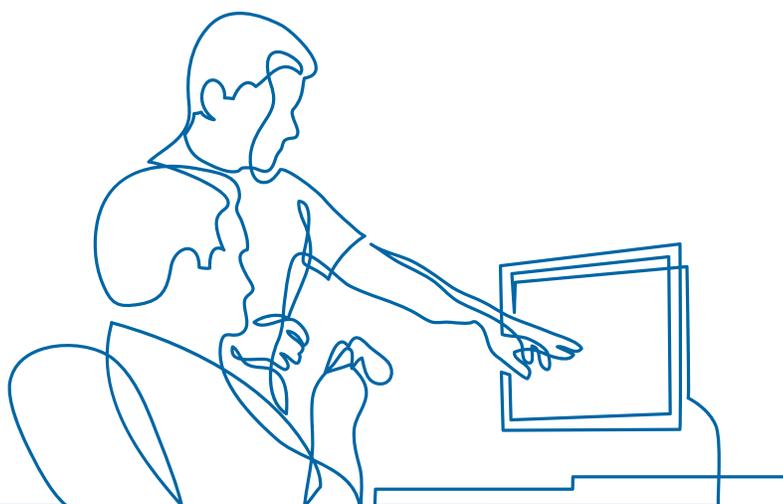
- Work as a therapist, clinical psychologist, or counselor.
- For 3D thinkers, consider diagnosing mechanical problems in a skilled trade or physical problems as a medical practitioner.
- Explore allied healthcare roles like occupational therapy, psychiatric nursing, or physical therapy.

## 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

IF YOU'RE INTERESTED IN

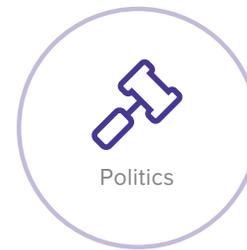
TRY



Nonprofits



Consulting, Social Work, Emergency Management



Politics



Campaign Strategy, Law, Judgeship



Business



Marketing, Executive Work, I/O Psychology



Technology



Research and Development in AI or VR



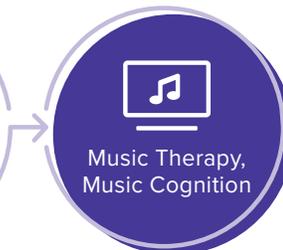
Healthcare



ER Doctor, Crisis Counselor



Music



Music Therapy, Music Cognition



Education



Education Policy, Professor, School Psychologist



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

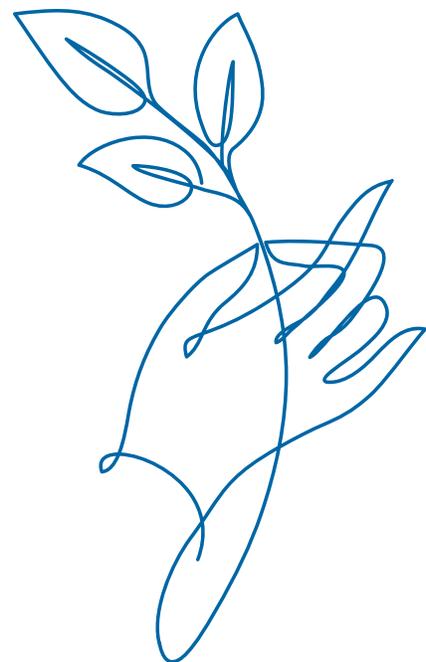
If you scored low on the Inductive Reasoning test, you may be more careful, deliberate, and methodical in reaching conclusions. When you are confronted with problems to solve in the workplace, you may prefer to take more time and have more information before making your final decisions. People who score 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.

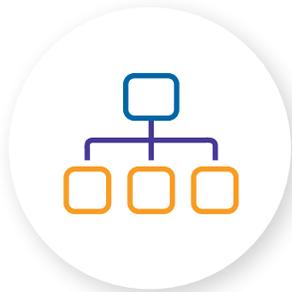
### LOW INDUCTIVE REASONING AND DIAGNOSTIC WORK

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

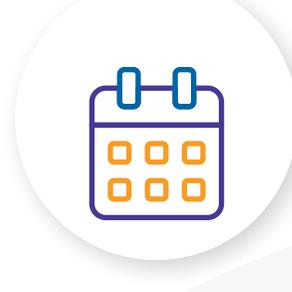
## Analytical Reasoning



Organization and  
Systems



Efficiency



Planning

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### 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.

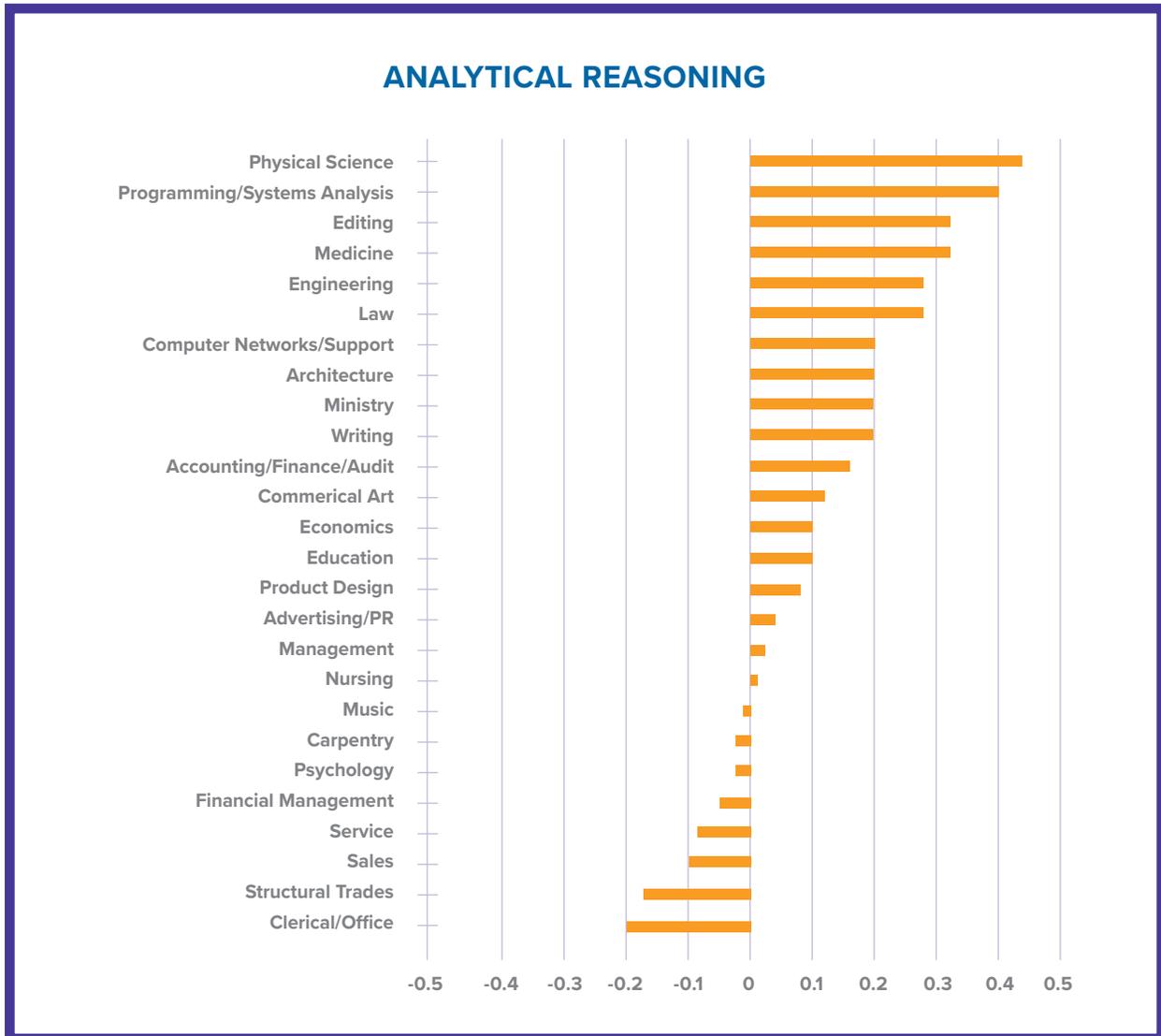
### THE APTITUDE

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 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

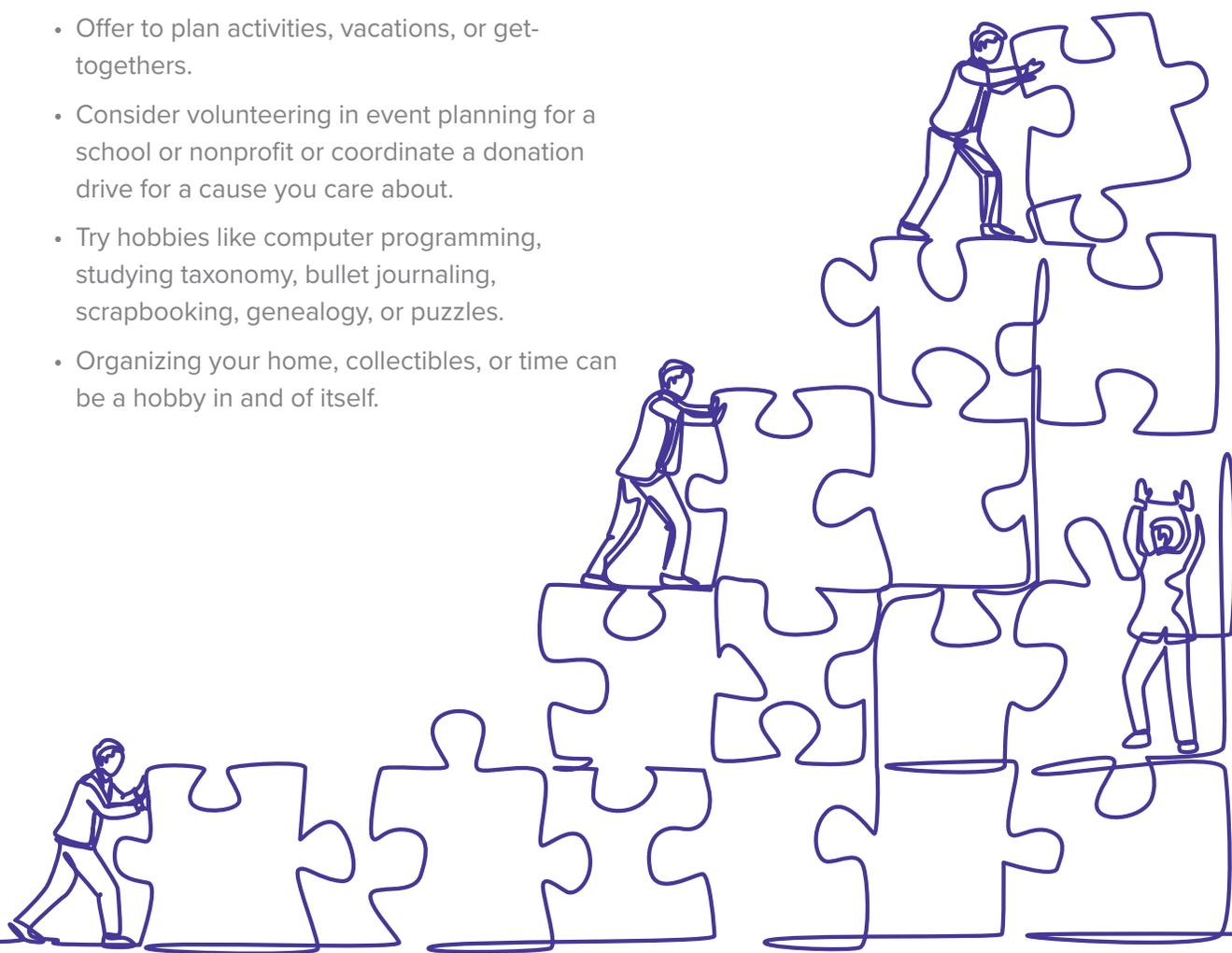
- Look for projects to manage and streamline. Run meetings to keep them moving on time.
- Edit the company newsletter or organize team-building or office social activities.
- Look for environments where you have the freedom to improve operations. You might be frustrated when you can see a more efficient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

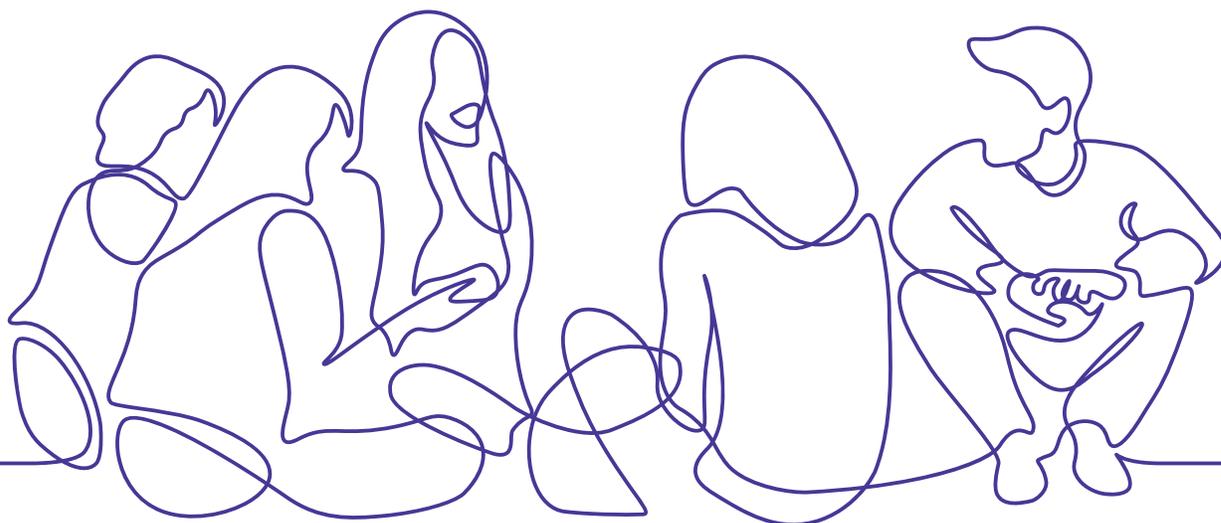
- Plan events in fundraising, marketing, or hospitality.
- Set and coordinate schedules as a travel agent or executive assistant.
- Work as an activities director for a museum or after-school program.
- Help others plan their financial futures, college experiences, or careers as a financial planner,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

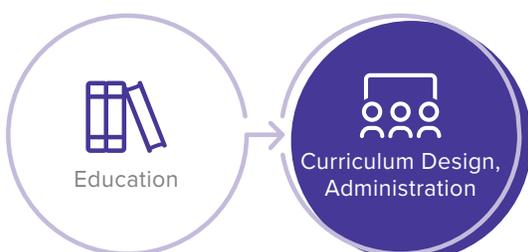
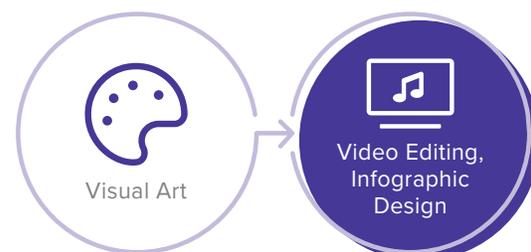
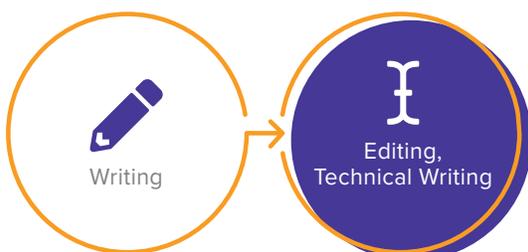
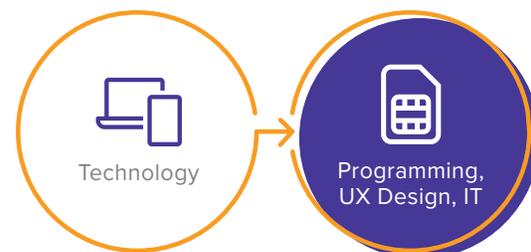
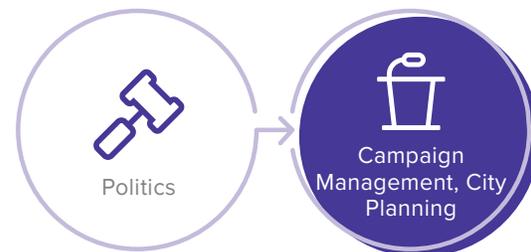


**IF YOU'RE  
INTERESTED IN**

**TRY**

**IF YOU'RE  
INTERESTED IN**

**TRY**



## MAJORS, MINORS, AND COURSES FOR ANALYTICAL REASONING

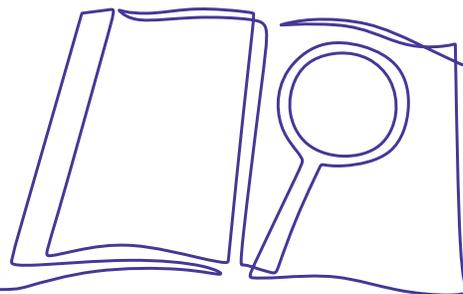
The Analytical Reasoning aptitude can be useful in almost any class or industry, so you might not have to seek out a way to use it. If you scored high in this area and get satisfaction out of applying order to problems or information, consider these courses and majors.

### 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

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### THE TESTS

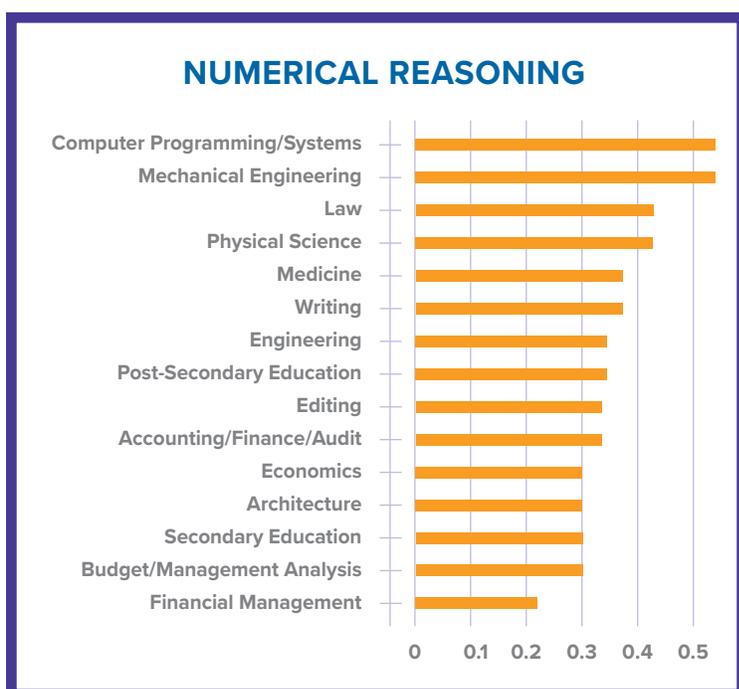
The three numerical tests we administer measure three separate and distinct abilities. Scoring high on one or two of them doesn't mean you'll score high on all three. The combination of your scores on these tests can indicate the nature of the talent you have with numbers.

- ✔ **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

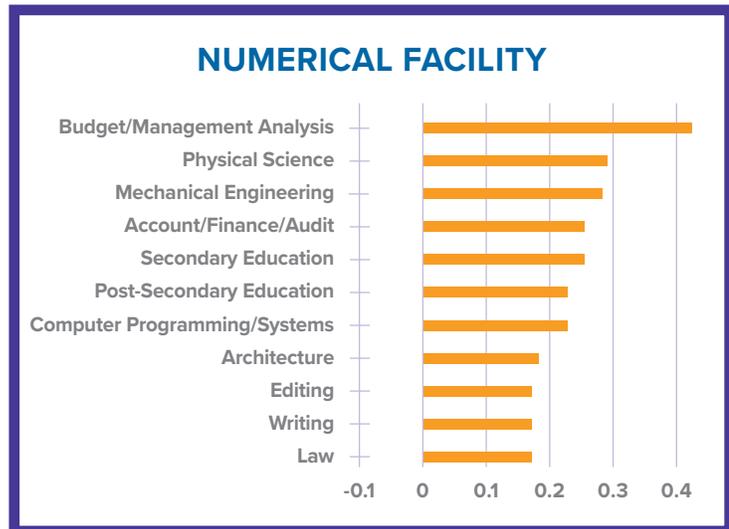
## IF YOUR PATTERN IS NONSPATIAL

- 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

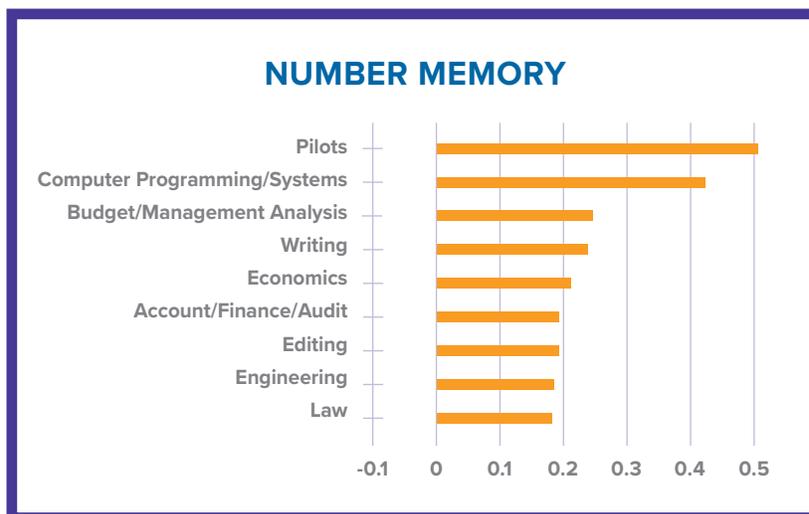
- Tallying figures for a client at work.
- Scoring tests or quizzes as a teacher.
- Tracking your household budget.
- Converting currency when overseas.
- Modifying measurements in recipes.
- Calculating a tip at a restaurant.
- Estimating material costs for a craft or home improvement project.

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



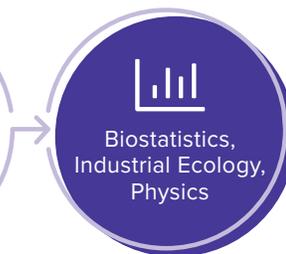
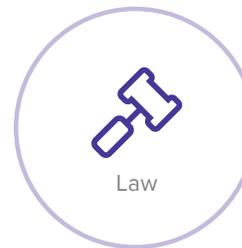
**IF YOU'RE  
INTERESTED IN**

**TRY**



**IF YOU'RE  
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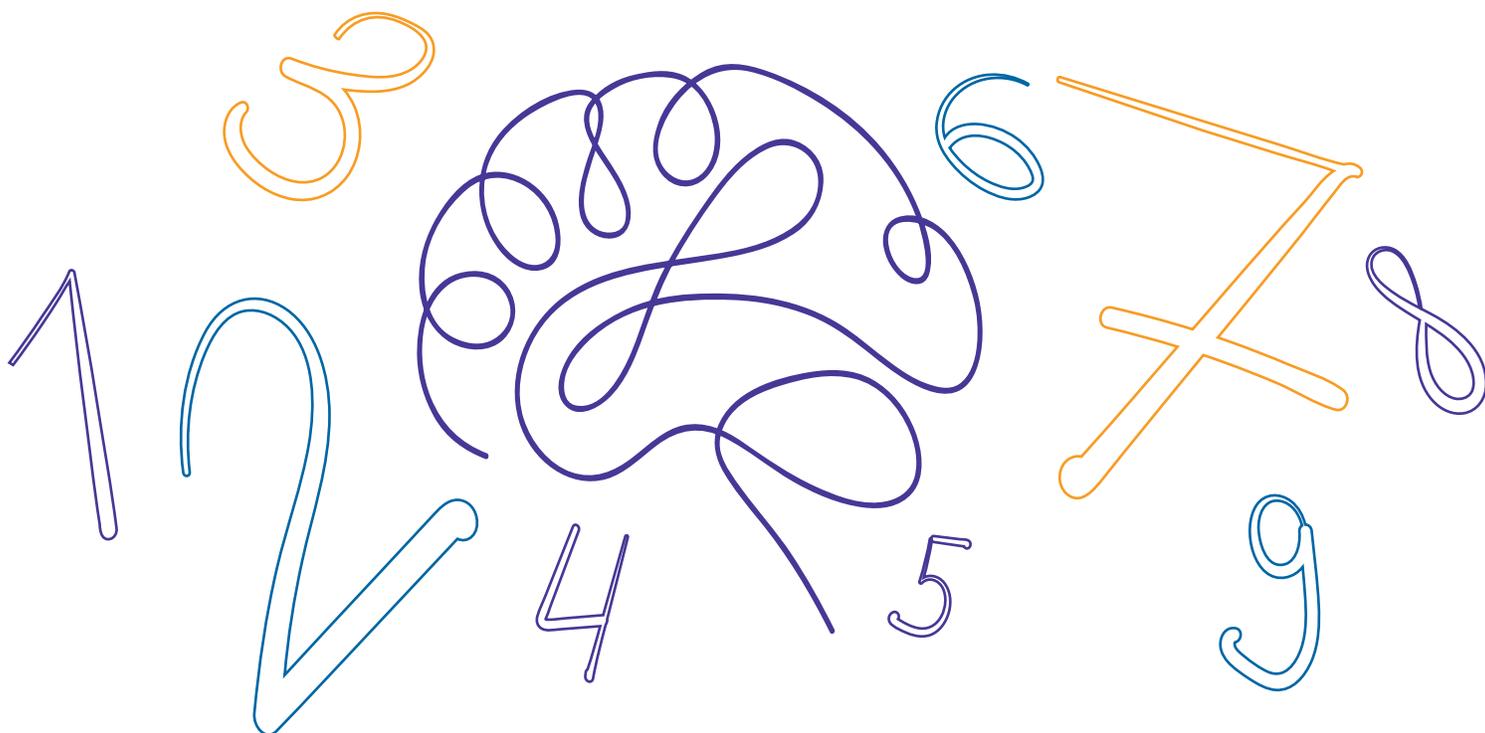


## LOW GRAPHORIA AND NUMERICAL APTITUDES

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



# 07

## Auditory Aptitudes



Music



Sound



Language

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### THE TESTS

The Foundation measures three different auditory abilities. These aptitudes are strongly correlated with music professions but are also utilized in fields that rely on sound, acoustics, or even language.

All three of our auditory tests are administered during the audiovisual portion of the testing. Many examinees remember these as the tests involving electronic beeps. They may be unpleasant to the ear, even for clients who score high. This is intentional to prevent examinees with musical training from having an advantage over others without any musical experience.

- ✔ **Tonal Memory** A sequence of tones are played twice, and examinees identify which tone has changed.
- ✔ **Pitch Discrimination** Two tones are played, and examinees identify whether the second tone was higher or lower in pitch than the first.
- ✔ **Rhythm Memory** A pattern of rhythms is played twice, and examinees indicate whether the second rhythm is the same as the first.

# TONAL MEMORY

## THE APTITUDE

Tonal Memory, the ability to recall sequences of tones, is often thought of as the central music aptitude; after all, most people mainly associate music with melody. It is this ability that causes some to remember new music after the first listen or sing along with a song only heard a few times. For a musician with this aptitude, learning to play something new requires less effort. A melody heard once or twice is more easily recalled, making it easier to memorize and perform. Perhaps more importantly, tonal memory may be what makes music memorable and meaningful for some people. Without Tonal Memory, people can enjoy listening to music, but when the song ends it's more difficult to remember the piece. For someone with this aptitude, melodies tend to linger, often leading to an urge to play an instrument or write music of their own.

Auditory abilities were among the first distinct aptitudes that researchers in the early 20th Century — specifically psychologist Carl Seashore — were able to isolate. The Foundation has been administering variations of Seashore's tests since the 1930s.

## TIPS FOR TONAL MEMORY

- Learn new information by connecting it to songs or melodies. You might also like studying while listening to music.
- Enjoy your music! You might feel like songs get stuck in your head easily. Even if you're not a musician yourself, you are using this aptitude when you listen to music or go to concerts.
- Try hobbies like playing an instrument, acting, public speaking, or DJing at parties, making playlists for your friends, volunteering at a radio station, or taking a foreign language class.
- Consider working in fields that are music- or sound-adjacent like speech pathology, audiology, film, or music technology.

Auditory aptitudes play a large role in performing arts, like acting. The Foundation has tested a small group of household-name actors and actresses. While their other aptitude scores varied, strong auditory aptitudes characterized their patterns.

# PITCH DISCRIMINATION

## THE APTITUDE

Pitch Discrimination measures the ability to distinguish between different frequencies, or pitches, of sound. People with this aptitude are more likely to notice mistakes in music or be able to tell when an instrument or singer is out of tune. A precise awareness of pitch is not only helpful for a musician, but also for a choral director, music teacher, audio producer, or someone who builds musical instruments or sound equipment. It's less essential for someone playing the piano, a fixed-pitch instrument, and more essential for playing a continuous-pitch instrument like the violin, where notes must be learned by ear.

In addition to its usefulness when playing and practicing music, Pitch Discrimination may constitute a greater sensitivity to all types of sound. People with this aptitude often report that they are bothered by low quality audio equipment or sound distortion and can be sensitive to ambient noises in general.

## TIPS FOR PITCH DISCRIMINATION

- Pay attention to interpersonal communication — you might find you're more sensitive to changes in vocal nuance.
- Consider roles that involve diagnosing problems with machines. Mechanics often ask what sound an engine is making when you bring your car in for repairs.
- Try learning tonal languages like Mandarin. Pitch Discrimination could be useful in discerning the small differences.
- Try hobbies like playing a pitch-based instrument (horns, violin, etc.) and singing.
- Look at sound-reliant fields like acoustics, speech pathology, sound editing, or audiology if you did not score high on our other auditory tests. You might prefer to take this ability in the direction of “sound” rather than “music.”

### PITCH DISCRIMINATION AND “FINENESS OF PERCEPTION”:

At one point Johnson O'Connor thought Pitch Discrimination was related to the experience of being “finely-tuned” in general. Here are some of our favorite “High Pitch” client experiences:

- Clients who identify as particularly light sleepers.
- A chef who can “hear” when food is finished cooking.
- The client who became a sommelier, because she could taste subtle notes in wine.

# RHYTHM MEMORY

## THE APTITUDE

Rhythm Memory measures the ability to learn and remember rhythms or beats. Someone with this aptitude might be particularly drawn to complex or syncopated rhythms, or to playing instruments like the tuba, bass, or drums that carry the rhythmic line in music.

Rhythm Memory has many uses beyond its place in music. Though we measure it with an auditory test, the sense of rhythm is not a purely auditory aptitude; it seems to have applications in sports and movement-based fields along with several aspects of writing. A recent study found that photographers also score high as a group. This could possibly be related to capturing motion in photographs, especially for wildlife, event, or fashion photographers. Rhythm and tempo are metaphors that are often used in the visual arts to reference movement or flow in a picture.

## TIPS FOR RHYTHM MEMORY

- Try remembering terminology or vocabulary by listening for the rhythm of the word or by turning information into a rhyme.
- Explore hobbies like sports, dance, martial arts, playing percussion instruments, learning foreign languages, or running.
- If you're a gamer, look for video games in the "rhythm game" or "rhythm action" genres.
- Consider working with verbal communication and the "flow" of words in writing, acting, or public speaking.

Did you know Rhythm Memory could be useful in medicine? Cardiologists have to recognize and analyze irregular heartbeats. There have even been music projects that turn heart arrhythmias into songs.



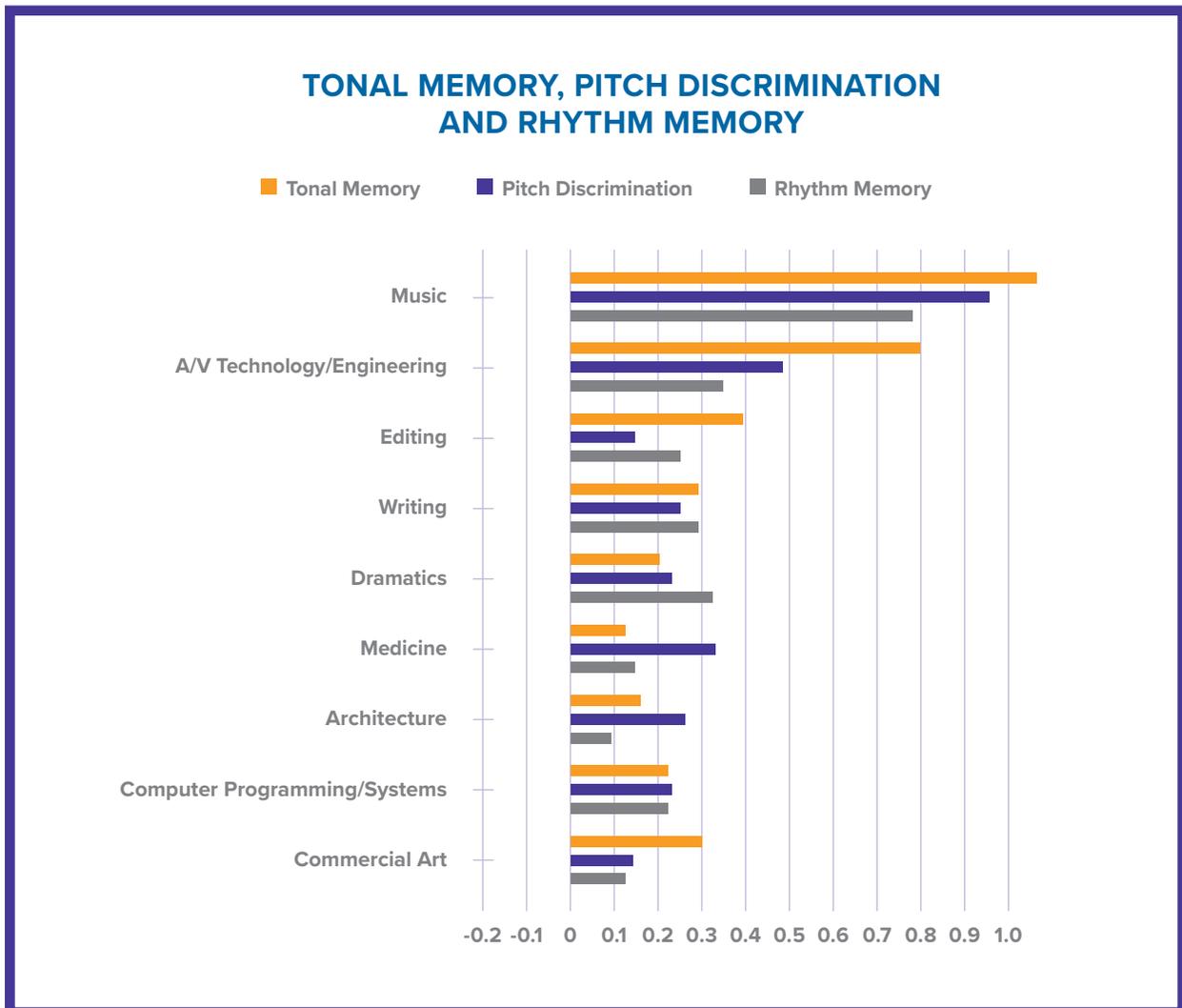
# AUDITORY APTITUDES AND MUSIC

Our recent studies of professional musicians show that they, as a group, tend to score high in all three of the current auditory aptitudes that we measure. Below you can see that musicians are clearly the highest scoring group on all three auditory aptitudes, followed by technicians working in the audiovisual space.

Another study showed that music majors scored high in all three auditory aptitudes. Theater and foreign language students also scored higher in these areas than other groups.

## RARE TALENTS

It's relatively rare to score high on all three of our auditory tests. **62%** of clients score high on at least one auditory test; **33%** score high on two; but only **12%** score high on all three.



## NOT JUST FOR MUSICIANS

Not everyone who scores high in auditory aptitudes wants to make a career in music, or even play an instrument. For some people, making music a part of their daily lives or as a hobby is enough of an outlet to satisfy these talents.

If you think of these scores as related not just to music but to sound in general, you'll find more opportunities to use them. For example, we know that auditory abilities correlate strongly with languages (many researchers have found that musicians have an easier time learning a second language than non-musicians), so you might use them if you work for an international company or overseas. Outdoor work can provide access to sound opportunities, as well. Think about situations where being particularly attuned to the sounds around you would benefit the work, like in the Sound and Sky Department of the National Parks system. Any industry or position where listening or sound information is a factor will be helped by auditory aptitudes.

If you do love music but don't want to play professionally, think of musicians as "your people" and look for roles on the business end of the music industry. A computer programmer or accountant with auditory aptitudes will likely enjoy working at a company related to music, like a music-streaming startup or concert hall.

## MUSIC AND ACHIEVEMENT

Unless you're a musician, playing an instrument might not seem like an obvious way to help your career, but many researchers have noticed a connection between artistic hobbies and innovative thinking. Mastering an instrument takes discipline, patience, practice, and creativity, which some — including the Nobel Prize organization — have compared to the process of making a scientific breakthrough. Playing with other musicians can also foster teamwork and enhance intuition.

"I think trying to be marginally successful in learning how to be a musician taught me how to be a scientist."

— *Thomas Sudhof, winner of the 2013 Nobel Prize in Medicine*

# Make It Auditory



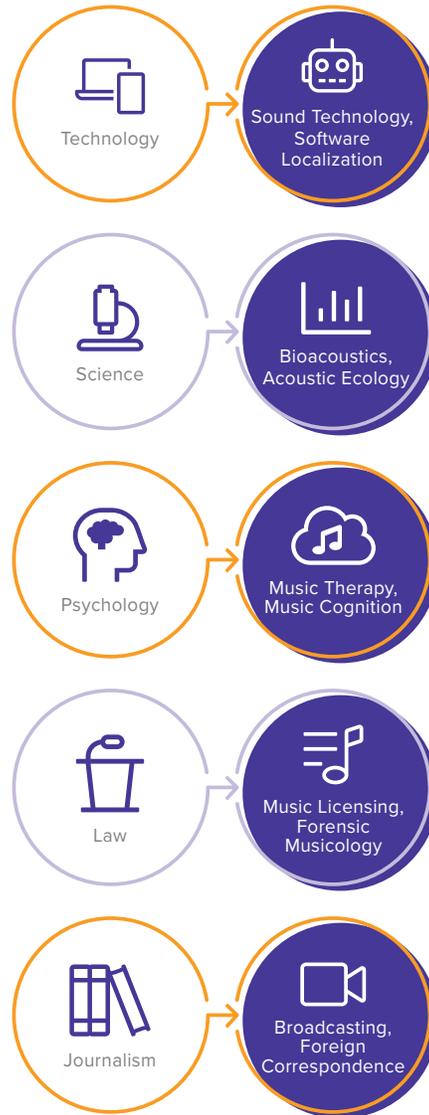
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## MAJORS, MINORS, AND COURSES FOR AUDITORY APTITUDES

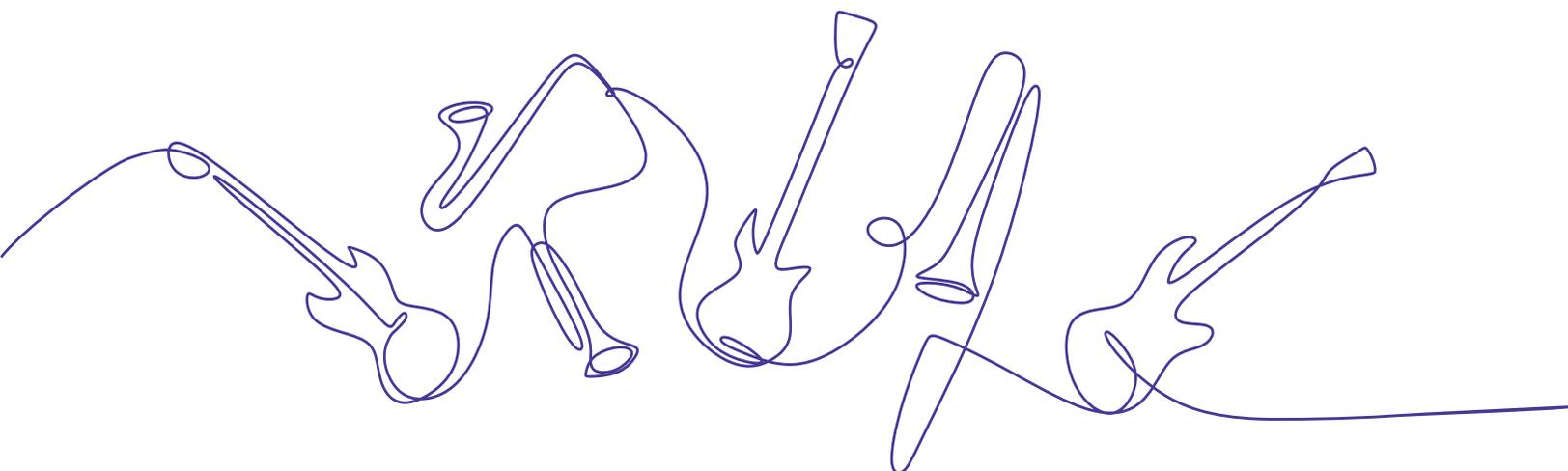
Music classes can provide clear outlets for auditory aptitudes, but you can also look beyond music when you're researching college majors or trade schools. Consider supplementing a non-music major with a minor, certificate, or a few classes in something more sound-oriented. For example, a history major who learns broadcast technology could write or produce podcasts.

### IF YOUR PATTERN IS SPATIAL

- Acoustic Architecture or Engineering
- Audio or Sound Engineering
- Sound Design
- Computational Linguistics
- Audiology
- Mechanics
- Acoustic Biology
- Sonar Technology
- Environmental Science
- Ecology
- Music Production

### IF YOUR PATTERN IS NONSPATIAL

- Music Performance
- Music Therapy
- Theater
- Foreign Languages
- Music History
- Musicology
- Speech and Communication Disorders
- Dance
- Music Business and Management
- Public Speaking
- Sound Technology
- Broadcast Journalism
- ESL Teaching



# 08

## Visual Aptitudes



Art and Design



Inspection



Visual Information

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### THE TESTS

The Foundation measures four different visual abilities. These aptitudes seem to play a part in art and design careers but can also be used in other fields that rely on visual information or details.

- ✔ **Memory for Design** A series of line drawings are shown, and examinees connect the dots to reproduce the images from memory.
- ✔ **Observation** Examinees identify small changes in visual details of pictures of everyday items.
- ✔ **Color Discrimination** Colored caps are organized to create color gradients. The test is administered using the Farnsworth-Munsell 100 Hue Test, the industry standard for measuring color aptitude.
- ✔ **Visual Designs I & II** Examinees indicate an aesthetic preference between two abstract images.

# MEMORY FOR DESIGN

## THE APTITUDE

Memory for Design measures the ability to remember and reproduce abstract line drawings. This is a visual memory which seems to be helpful for remembering information you can see — charts, graphs, timelines, infographics, and blueprints. People with this aptitude are often more aware of styles and trends in visual fields like architecture and fashion. They often report that they can remember maps without referring to them and might have an easier time in classes like art history where most of the relevant information is pictured, rather than written.

As the name indicates, Memory for Design is helpful in artistic fields like graphic design, interior design, painting, or industrial design. Commercial artists and curators tend to score higher in this area, along with architects. Not everyone who has this aptitude would consider themselves to be "artistic", however. If you don't consider yourself to be an artist, look for opportunities to work with line and form, which could mean anything from working in web design and page layout to collecting maps as a hobby.

## MEMORY FOR DESIGN TIPS

- Learn new information through infographics, diagrams, or timelines.
- Turn class or project notes into outlines or pictures, or create a bullet journal.
- Learn a character-based language like Mandarin or Arabic.
- Try hobbies like photography, calligraphy, map making, illustration, textile design, or painting.
- If you're not an artist yourself, consider a visual industry like fashion, design, architecture, museums, real estate, or film.
- Try extracurricular activities like yearbook, photojournalism, theater tech, or art classes.

The Foundation developed the Memory for Design test in 1937. It was based on a test created by Carl Hull, a psychologist with a background in engineering who taught a class on aptitude testing at Yale University.

## MEMORY FOR DESIGN AND STRUCTURAL VISUALIZATION

Memory for Design shows some correlation with the Structural Visualization aptitude. Many activities that use three-dimensional thinking, like reading architectural drawings or interpreting x-rays, also lean on a strong visual memory. Architects, design engineers, computer programmers, drafters, and physicians all score high in both 3D thinking and Memory for Design.

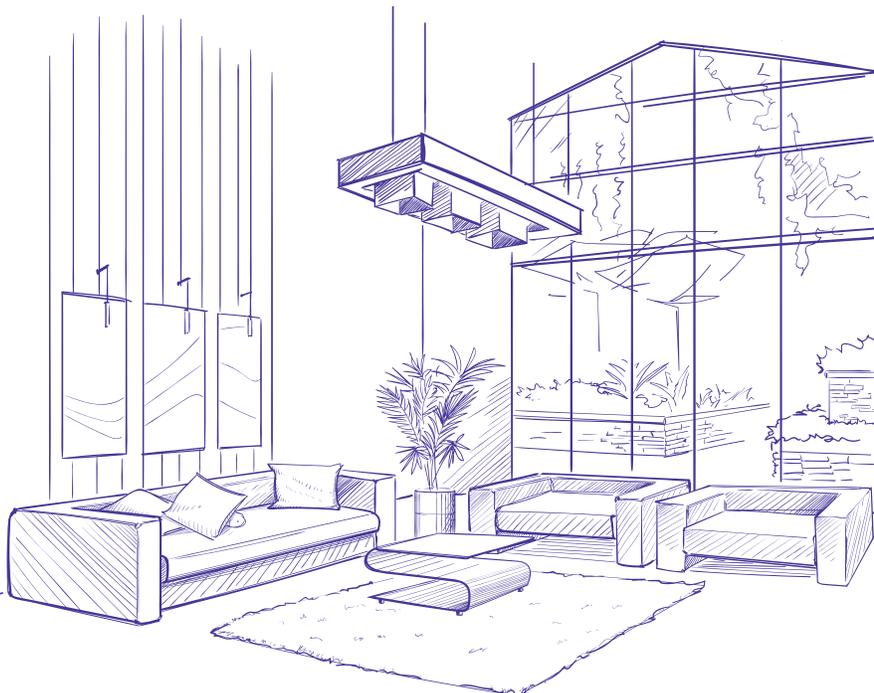
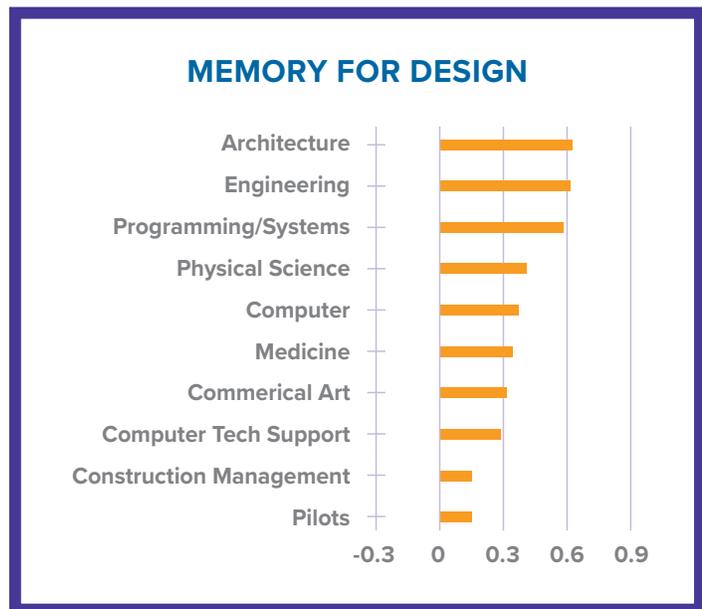
A recent study also showed that physical and life scientists have this ability. This memory even seems to have some effect on which college major a student chooses: Students studying engineering, mathematics, architecture, and computer science showed the highest Memory for Design scores of all.

## NOT JUST FOR ARTISTS

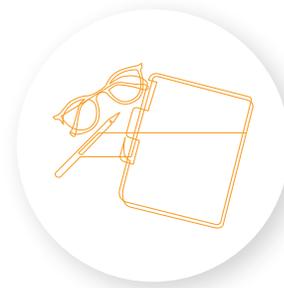
Memory for Design is a versatile aptitude that can be useful in many places outside of art and design. Consider real estate or historic conservation and preservation as possible avenues for this aptitude:

Realtors research properties, familiarize themselves with neighborhood layouts, and explain home designs to clients. Commercial real estate brokers also familiarize themselves with properties that might fit their clients' needs. You'll find blueprints and space layouts to be a big part of both these fields.

Historic conservators are often passionate advocates and history buffs with deep knowledge about a city's historic buildings, maps, and past. In a nonprofit setting, they might share that knowledge through guided tours and public awareness campaigns, but there's also a business side to conservation. Some consultants in the field provide their knowledge to cities with district revitalization projects.



# Make it Visual



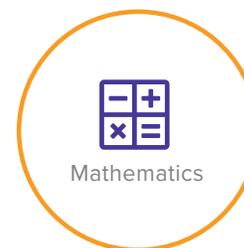
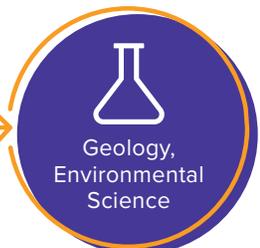
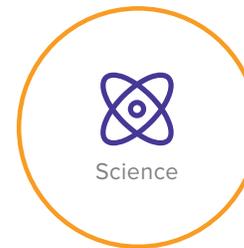
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# OBSERVATION

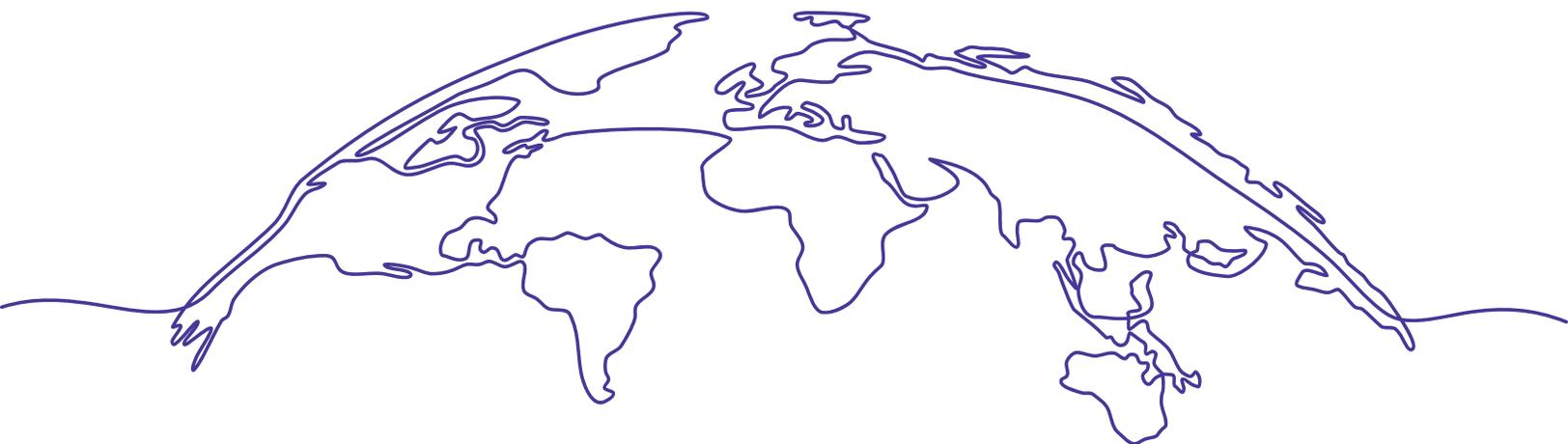
## THE APTITUDE

Our Observation test measures the ability to notice and remember small visual details. The test was initially created as a screening measurement for meter inspectors at General Electric and proved to be a good predictor of success in the role. Observation seems to be helpful in inspection or quality control careers, but can also be applied in art fields or any role where noticing small visual details or creating visual perfection is required. You can also think of this aptitude as a specific method for information gathering and communicating, which is why it could also be helpful for monitoring behavior (like a teacher or therapist would, for example); orienting yourself in new places when you travel; and noticing details about the people and world around you.

## OBSERVATION TIPS

- Be the person who has the last look at a project before it's submitted.
- Try hobbies like bird watching, nature walks, stargazing, geocaching, jigsaw puzzles, photography, or scavenger hunts.
- You might benefit from an "observational learning" style – learn new skills by watching others in action.
- Pay attention – you might be more tuned in to visual details about other people, like changes in their appearance.

The earliest version of the Observation test used real, household objects on trays. A test administrator would rearrange the objects and ask the client to spot the difference.



# USE YOUR APPROACH

Look for opportunities to inspect, monitor, observe, supervise, or use your sharp eye for visual details.

## REAL ESTATE

- Housing Inspector or Appraiser
- Home Stager
- Real Estate Agent
- Building Manager
- Surveyor

## FILM

- Video Editor
- Continuity Supervisor
- Location Scout
- Set Decorator
- Merchandiser
- Cinematographer

## LAW ENFORCEMENT

- Crime Scene Investigator
- Detective
- Special Agent
- Fire Inspector
- Security Detail
- Private Investigator

## MANUFACTURING

- Quality Control Inspector
- Inventory Manager
- Safety Inspector
- Gas or Chemical Plant Operator

## ART AND FASHION

- Art Restorer or Appraiser
- Skincare Specialist
- Event Planner
- Stylist
- Merchandiser
- Curator
- Graphic Designer
- Garment Technologist



## SCIENCE

- Medical Technology
- Field Biologist
- Archaeologist
- Park Naturalist
- Lab Technology

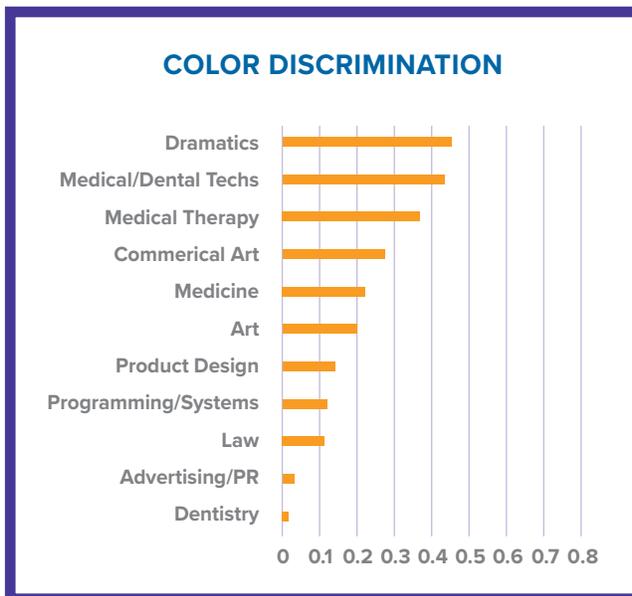
## AVIATION

- Pilot
- Flight Attendant
- Aviation Inspector

# COLOR DISCRIMINATION

## THE APTITUDE

Color Discrimination measures the ability to see fine distinctions between very similar hues. It is helpful for painters and artists, as well as people in other design-related fields like graphic design, interior decorating, and jewelry making. It could also be an asset for people working with makeup, hair coloring, or other cosmetics. Beyond these more obvious endeavors, talent in discriminating slight differences in color could be useful in a science laboratory for identifying different chemicals or minerals, noticing diseased tissue samples, or distinguishing between different plant and animal specimens. This aptitude may also benefit a print supervisor at a publishing house, an animator for a film production company, a dermatologist looking at irregularities on the skin, a textile artist dyeing fabric, or a laboratory technician tinting dental crowns.



Medical therapists (Physical, Occupational and Speech Therapists) have higher scores in Color Discrimination than many other professions. Color therapy is often used by health practitioners as part of a holistic approach to treatment.

The Munsell Color Order System was developed in the early 20th Century by artist and professor Albert H. Munsell who wanted to bring order to the study of color. His hope was that a universal system would let any artist see colors in a uniform way, just like any musician can hear notes when they're reading music.

## COLOR AND INDUSTRY

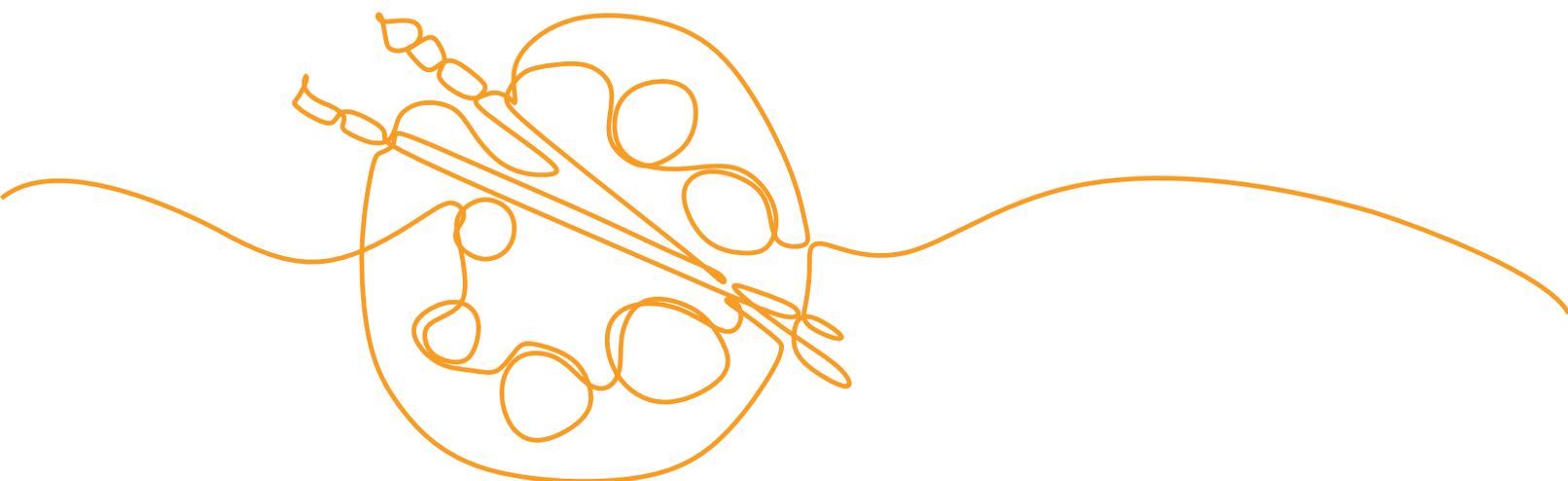
Color standards play a big role in keeping us safe in all kinds of industries. If you have an interest in entrepreneurship or product development, you might find yourself thinking not only about the colors that most appeal to your customers but also which colors are the industry standard. Anyone working in food or agriculture will use color standards to sort and process crops and food items. Brewers and vintners have their own color scales that they use to measure and classify their beverages. Color is so integral to our perception of how beer and wine tastes that some researchers have been able to fool oenology (wine science) students into mistaking a white wine for a red just by changing its color.

We often think of archaeologists and anthropologists as digging up artifacts, but they also study the soil around historically significant sites for clues about what happened there and when. Just like the Color Discrimination test we administer, these professionals work with a color scale that helps them classify the subtlest shades of the ground they study.

Looking for even more color-related fields? Forensic pathology, education, environmental studies, prosthetics, prosthodontics, and pharmaceuticals are other possibilities.

### COLOR DISCRIMINATION TIPS

- Turn reports and other information into colorful presentations.
- Try hobbies like color theory classes, gemology, painting, photography, museum visits, adult coloring books, gardening, floral arranging, or interior decoration.
- Learn about color psychology and add color accents to your home or office.
- Help plan the color schemes for events at home or work.



# Make it Colorful

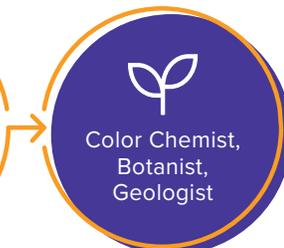
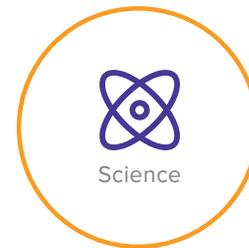
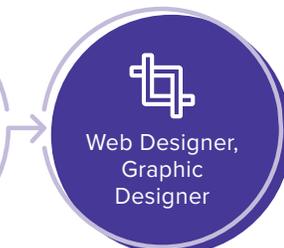
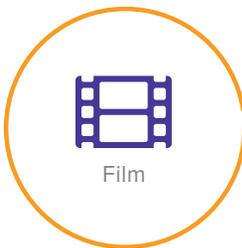


IF YOU'RE INTERESTED IN

TRY

IF YOU'RE INTERESTED IN

TRY



# VISUAL DESIGNS

## THE APTITUDE

The Visual Designs preference test was created in an effort to objectively measure general artistic ability. The closest we've come is having identified two concepts of design composition that artists as a group seem to prefer. The Visual Designs test scales measure innate preference in these two areas.

While it is only one test, Visual Designs looks at two different factors. In Visual Designs I, the choice is between a simple design and a more complex one. An illustration of this idea would be two canvases — one with a few short lines on it, the other having a large number of these lines. The first canvas could be called “simple” while the other, busier with more information, could be called “complex” in nature. In Visual Designs II, the choice is between symmetrical and asymmetrical designs.

High scorers in Visual Designs I choose the simple designs, which was the preference of professional artists who took the test when it was first developed. High scorers in Visual Designs II choose the asymmetrical designs, which was the preference of the fine artist subset in this study.

These preferences seem to be innate, as studies of schoolchildren indicate that those who have had art training do not perform differently than those without such training. Someone who has high or low scores is expressing a definite opinion or sense of artistic style.

A neuroimaging study showed a relationship between the Visual Designs measurements and brain areas associated with aesthetics and artistic production.

Only 5% of people who take the Visual Designs test score high on both measurements.

Fine artists and commercial artists we studied disagreed when it came to the symmetry of the compositions in this test. Fine artists and photographers preferred more asymmetrical compositions, while commercial artists favored balance.

# VISUAL DESIGNS AND STYLE

Someone who has definite high or low scores is clearly stating their preferences and point of view.

## WHEN YOU SCORE HIGH

When you score high in Visual Designs I, or I and II, it signifies that your preferences are in line with those of the professional artists used in our norm sample. Commercial artists, fine artists, and photographers all preferred more empty space in the compositions they were shown (high Visual Designs I). When combined with other visual aptitudes, this natural style might suggest that some sort of art or design work could be something to consider.

## WHEN YOU SCORE LOW

When both scores are low, it means that the opinions expressed, while definite, contrast in some ways to the opinions of our sample of professional artists. This, of course, would not necessarily prevent one from being successful in art or design — it simply means that a contrary sense of style is different from, in theory, the generally preferred style.

## WHEN YOU SCORE IN THE MIDDLE

When people score average on one of these measurements it could indicate the lack of a strong opinion, or flexibility, or the ability or desire to vary the style. An artist without strong feelings about these two ideas might change their style depending on the subject, their mood, or the medium or materials used.

### IF YOU SEE THE WORLD LIKE AN ARTIST, CONSIDER

- Buyer
- Curator
- Visual Editor
- Art Director
- Photographer
- Trend Forecaster
- Brand Manager
- Personal Shopper
- Stylist
- Merchandiser



## MAJORS, MINORS, AND COURSES FOR VISUAL APTITUDES

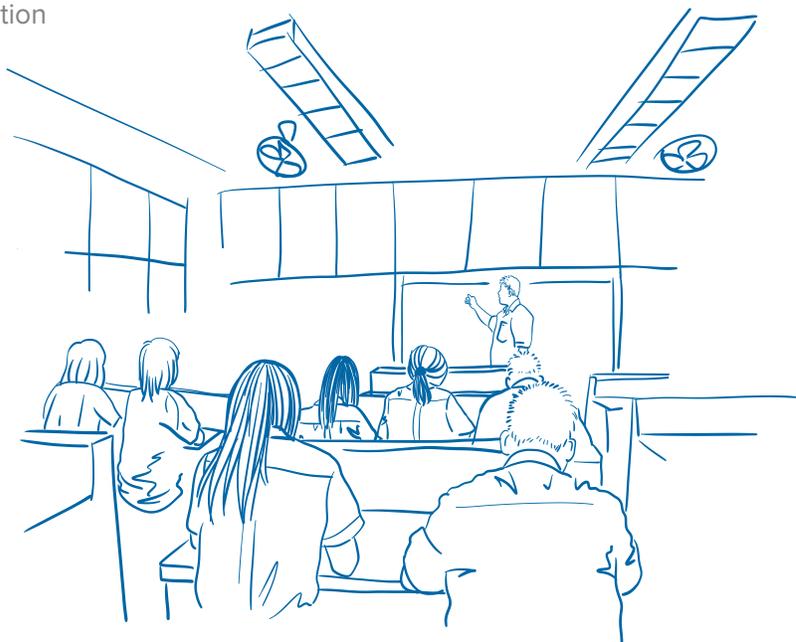
Art and design programs can provide clear outlets for visual aptitudes, but you can also look beyond art when you're researching college majors or trade schools. Consider supplementing a major in a different area with a minor, certificate, or a few classes in something more visual. If you are interested in majoring in art or design, keep in mind that some art and design programs require a portfolio to apply. Start collecting samples of your work throughout high school or consider doing an immersive summer program in design or design principles before you apply.

### IF YOUR PATTERN IS SPATIAL

- Architecture
- Environmental Design
- Urban Design
- City and Regional Planning
- Biomedical Engineering
- Astronomy
- Geographic Information Technology
- Digital Arts and Media Technology
- Computer Graphics Technology
- Industrial Design
- Interior Design
- UX Design
- 3D Studio Art
- Geography

### IF YOUR PATTERN IS NONSPATIAL

- Art History
- Architectural History and Preservation
- Media Studies
- Studio Art
- Film Theory
- Marketing
- Art Education
- Family and Consumer Sciences
- Fashion Merchandising
- Textile Design
- Medical Imaging
- Inspection Technology
- Graphic Design and Illustration



# 09

## Silograms



Language



Terminology



International Work

### THE TEST

A series of nonsense words are shown, and examinees must remember their English equivalents.

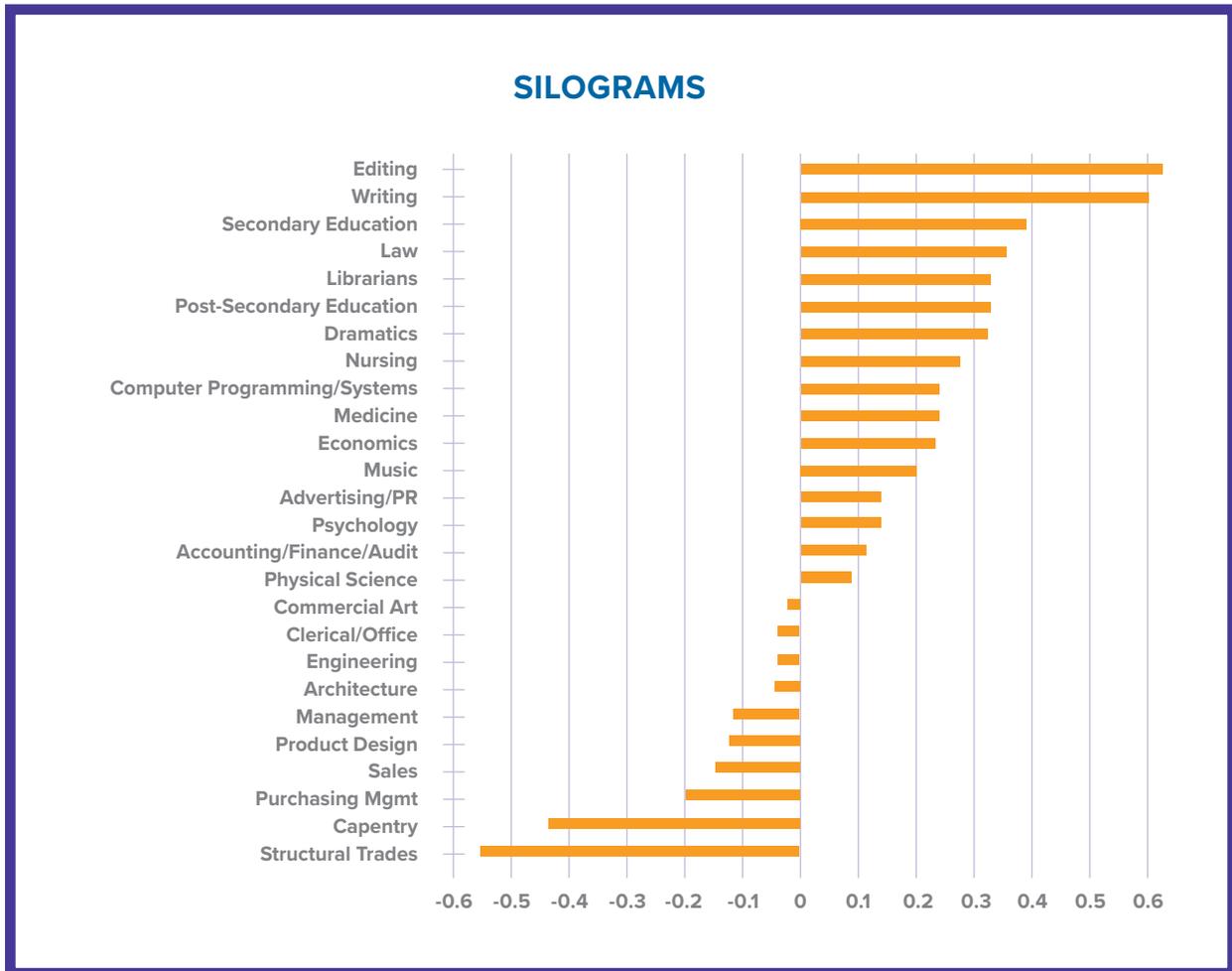
### THE APTITUDE

The Silograms aptitude is a word-learning ability. If you have this aptitude, you might find that it's easier for you to learn vocabulary, languages, or any type of specialized words. High scores on Silograms correlate with success in foreign language classes, so you should consider studying a second language or working in an international setting or with international populations. This word-learning ability can also be used in other ways that involve memorizing words: learning lines for a play, preparing to give a presentation, or learning the terminology for a new job or industry.

"Silogram" is the last name of the test creator, Kim Margolis, spelled backwards. The motivation for the development of the Silograms test was a perceived post-World War II need to isolate an aptitude associated with foreign language learning.

# WHO SCORES HIGH IN SILOGRAMS?

Our research shows strong correlations between the Silograms aptitude and language-oriented careers like editing, writing, law, and library science. There is less of a connection to certain structural careers like engineering and 3D trades.



## SILOGRAMS AND TECHNICAL FIELDS

Fields like the social sciences, biology, medicine, and economics contain a great deal of specialized terminology. Silograms seems to help professionals in these fields succeed in their work. Pre-med and medical students we've studied tended to have higher scores in this area. Silograms can also be helpful when learning programming languages.

Women in STEM fields (particularly computer science and engineering) have much higher Silograms scores than we see in men in the same fields. While numerical and spatial abilities are key predictors of success in STEM, Silograms clearly plays a role.

# TIPS FOR HIGH SILOGRAMS

## IN THE WORKPLACE

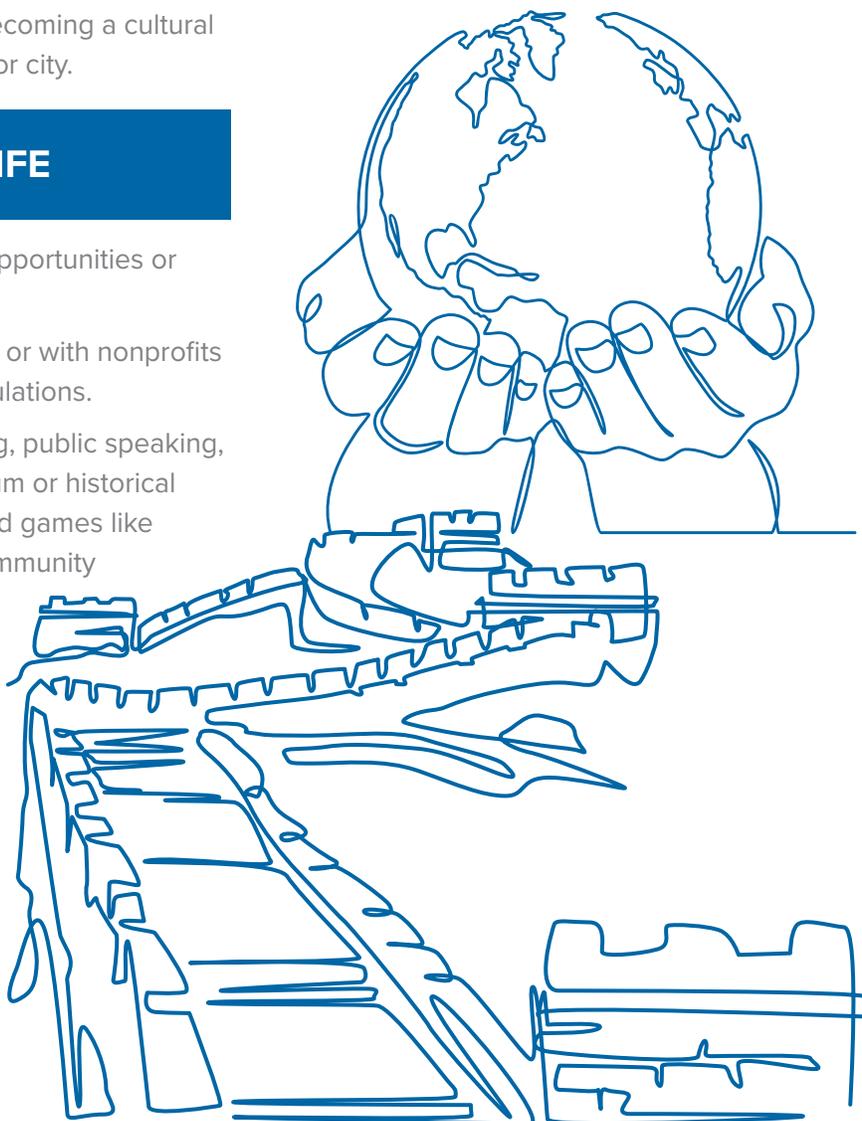
- Consider careers related to verbal communication, writing, and editing.
- Learn a second language and look for companies with offices overseas. You may have an easier time learning the local language if you relocate.
- Add "International" or "Global" to your search, like International Business, International Law, or Global Health, as part of your career planning.
- Explore cross-cultural directions like teaching English as a Second Language (ESL), running a study abroad program, or becoming a cultural ambassador for a company or city.

## IN DAILY LIFE

- Pursue international travel opportunities or study different cultures.
- Volunteer as an ESL teacher or with nonprofits that serve international populations.
- Consider hobbies like writing, public speaking, giving tours at a local museum or historical site, crossword puzzles, word games like Scrabble, onomastics, or community theater.
- Take a sabbatical:  
Volunteer with the Peace Corps or apply for a Fulbright Scholarship.

## IN THE CLASSROOM

- Use flash cards as study aids.
- Study a foreign language or add a foreign language minor to your other studies.
- Study abroad, participate in a foreign exchange program, or take an overseas gap year.
- Attend a language immersion school.
- Be a writer or editor for the school newspaper or join the Model UN.



## MAJORS, MINORS, AND COURSES FOR SILOGRAMS

The Silograms aptitude correlates with humanities and language-based or terminology-heavy courses. Adding these types of classes into your schedule is a great way to make use of this aptitude. You might also consider picking up a minor in a foreign language or classes that could lead to international work. Remember that some majors might require classes that cannot be taken overseas. If you want to study abroad, plan ahead to make it happen.

### IF YOUR PATTERN IS SPATIAL

- Computational Linguistics
- Global Urban Planning
- Medicine
- Biology, Botany, Zoology
- Global Innovation and Technology
- Cognitive Science in Language and Culture
- International Real Estate or Development
- Archaeology
- Computer Science or Programming
- Global Climate Change
- Speech Sciences
- Pharmacology

### IF YOUR PATTERN IS NONSPATIAL

- Foreign Languages
- Anthropology
- International Business
- International Relations
- Global Studies
- Linguistics
- Cultural Studies
- Translation Studies
- World Politics
- Ecotourism
- Comparative Literature
- Diplomatic Studies and Foreign Service
- Legal or Paralegal Studies

Students in foreign language and cultural studies majors scored significantly higher than other groups on the Silograms test.

# 10

## Graphoria



Administration



Scanning



Details

### THE TEST

Two columns of numbers are shown, and examinees indicate which pairs of numbers are the same.

### THE APTITUDE

Graphoria measures perceptual speed and accuracy. High scorers are able to move through the test quickly while making few (if any) mistakes. At work, Graphoria is helpful in performing administrative tasks like entering data, record keeping, and proofreading. At school, it is useful in activities such as note taking and multiple-choice testing.

None of the other tests we administer relate to this kind of visual processing speed. In fact, the other tests have been developed to be independent of performance on the Graphoria test so that clients who score low in this area won't be at a disadvantage on tests measuring other aptitudes, such as memory for numbers or word learning.

Graphoria was originally called the “accounting aptitude.” The test was created in 1922 as a tool for hiring employees in the accounting department at General Electric.

# TIPS FOR HIGH GRAPHORIA

## IN THE WORKPLACE

- Consider careers related to numbers, accounting, records management, and administration. Administrative leadership roles in nonprofit direction, human resources, or business management could also be a good fit.
- Volunteer to be the office proofreader, scanning over documents for mistakes, or keep the minutes for important meetings.
- Look for opportunities to use your ability in a field where keeping precise records is important like social work, law, human resources, or library science.

## IN THE CLASSROOM

- Capitalize on your quick perceptual speed in classes that require detailed note taking or timed multiple-choice tests.
- Use Graphoria to quickly and accurately fill out college applications and other important paperwork, or to manage large volumes of nightly reading and homework.
- Vary your schedule — Graphoria scores have been found to correlate with grades in 19 different high school courses.

## IN DAILY LIFE

- Be the treasurer or secretary for a club or organization.
- Volunteer in your school or community: Read to the elderly, help with grassroots organizations or political campaigns, be a volunteer notetaker for other students, join your neighborhood council, or stage manage a play or musical.
- Work on transcription projects for a library or museum.
- Play video games, read sheet music, or even use Graphoria in sports where scanning speed is especially important.

As a group, women average higher scores than men on the Graphoria test.



## WHO USES GRAPHORIA?

Our research shows high correlations between Graphoria and numerical and business fields like accounting, auditing, finance, and management analysis. There are, however, fields beyond numerical ones where you can capitalize on this aptitude. Generally, any position with protocols and procedures to follow, reports to read or write, or records to keep will be an outlet for this ability. That could mean using Graphoria in a project management role, as a human resources executive, in legal work, or in computer programming.

Graphoria has a negative correlation with fields like vocational trades and law enforcement. These career tracks require a lesser degree of clerical ability.

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## GRAPHORIA FOR ENTREPRENEURS

If you have an entrepreneurial mindset and Graphoria is a dominant aptitude in your pattern, you might consider becoming a freelance consultant. The tasks that your high Graphoria score helps you breeze through are often the very same tasks that people with low scores in this area find frustrating. You might explore the possibilities of starting your own small business in bookkeeping, virtual recruiting, medical billing and coding, personal organizing, or health information management.

There are also countless opportunities for consultants to assist aging populations in their homes. Independent patient advocates know the ins and outs of healthcare and help their clients with coordinating appointments and handling insurance claims. If numbers appeal to you more, consider working in personal money management to help the elderly with their bills and finances. Another option is estate administration – unwinding a person’s household and accounts at the end of life.



# Make it Clerical



**IF YOU'RE  
INTERESTED IN**

**TRY**



Writing



Copy Editing, Library  
Science, Content  
Management

**IF YOU'RE  
INTERESTED IN**

**TRY**



Social Work



Case Management,  
Social Work, Care  
Coordination



Business



Human Resources,  
Accounting,  
Inventory



Nonprofits



Archival Work,  
Nonprofit  
Administration



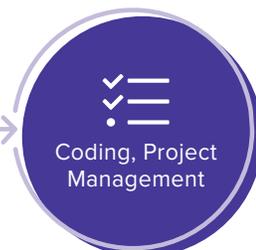
Healthcare



Insurance,  
Transcription,  
Administration



Technology



Coding, Project  
Management



Law



Court Reporter,  
Paralegal,  
Legislative Aide

## MAJORS, MINORS, AND COURSES FOR GRAPHORIA

Graphoria is a bonus in any aptitude pattern, since nearly every job involves some element of paperwork or record keeping. You might not have to seek out a way to use this aptitude, but there are some fields and positions where it plays a bigger role than others.

### IF YOUR PATTERN IS SPATIAL

- Engineering
- Computer Programming
- Information Technology
- Cost Estimating
- Air Traffic Control Studies
- Flight Engineering and Aviation Technology
- Nuclear Technology
- Systems and Operation Management
- Pharmacology
- Chemistry

### IF YOUR PATTERN IS NONSPATIAL

- Accounting
- Library Science and Archival Studies
- Social Work
- Health Administration
- Legal and Paralegal Studies
- Education Administration
- Public Administration and Public Sector Management
- Nonprofit Management
- Bookkeeping
- Human Resources Management



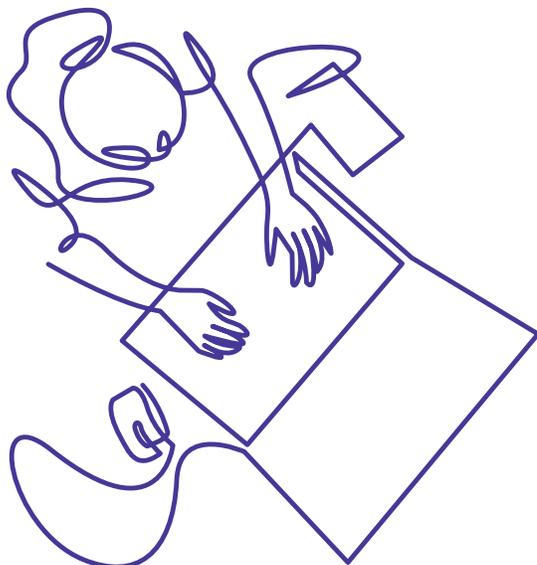
# WHEN YOU SCORE LOW

## MINIMIZE AND DELEGATE

If you score in the lower range, be mindful that checking or managing paperwork might be tedious for you. Look for ways to minimize or avoid those tasks and focus on the areas where you do have a natural ability. The good news is, though clerical tasks are prevalent in schoolwork, they aren't as important in every job or field. If you score low, your frustration may have an expiration date.

### IN THE WORKPLACE

- Give yourself more time to complete paperwork tasks like inventory or data entry.
- Delegate clerical work if you can. Look for roles where a teammate or assistant can handle it.
- Complete your paperwork tasks when you feel freshest to avoid frustration or procrastination.
- Choose a career path that minimizes record keeping and data entry. If you're high in Structural Visualization, consider learning a trade or craft. If you're nonspatial, look for roles that let you focus on people rather than paperwork.
- Take advantage of technology and software programs to help you stay organized and handle the details.



### IN THE CLASSROOM

- Look for classes or schools where the emphasis is on papers, projects, labs, or participation rather than nightly homework and timed tests.
- Balance your schedule by spacing out paperwork-heavy classes. Consider taking high-Graphoria classes like accounting during the summer, when you can focus on one class at a time.
- Go through an exam as quickly as possible, then double-check your work afterwards if tests tend to slow you down.
- Consider smaller classes or schools — they may offer more opportunities for project-based assignments and class discussions.
- Try recording lectures rather than taking detailed notes; you might also benefit from listening to audio versions of your textbooks while you follow along with the written text.
- Make the most of the tools you're given. Use online notes, tutoring, and office hours to supplement lecture materials.

# 11

## Dexterity Aptitudes



Crafting and Fixing



Healthcare



Fine Motor Skills

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### THE TESTS

Manual dexterity is the ability to do precise and coordinated work with your hands. The Foundation's two dexterity tests are examples of fine motor skills which use the smaller muscles of the hands and fingers. These tests measure distinct and different aptitudes, but many hands-on occupations likely use one or both abilities.

- ✓ **Tweezer Dexterity** Pins are moved from one side of a board to the other with tweezers. The test is scored for speed and accuracy.
- ✓ **Finger Dexterity** Pins are moved by hand from one side of a board to the other. The more holes filled with exactly three pins, the higher the score on the test.

# DEXTERITY

## THE APTITUDES

**Tweezer Dexterity** measures the ability to manipulate small tools with precision and speed. Model-making, needlework, and watch repair are all examples of tasks that would use this ability.

**Finger Dexterity** measures the ability to do fine, detailed work with the tips of your fingers. This aptitude is used in activities like gardening, writing with a pen or pencil, pottery, weaving, and baking. Some clients even feel their Finger Dexterity aptitude helps their typing speed.

These two tests were some of the first to be developed by Johnson O'Connor in the 1920s, when he was working as an engineer at General Electric. His task was to identify workers who would be successful at assembling electrical meters. When he gave the Finger Dexterity test to prospective employees, he found a strong relationship between high scores on the test and success on the job. One particular part of that assembly line required the use of tweezers. It was discovered that those with a high score on Finger Dexterity didn't necessarily have the ability to work with small tools quickly and accurately, which led to the creation of the Tweezer Dexterity test. The dexterity tests were the inspiration for O'Connor to develop more and more aptitude tests, and eventually to create his own foundation dedicated to the study of individual differences in human ability. Dexterity tests are still used today in areas like manufacturing, physical and occupational therapy, and jewelry technology.

## DEXTERITY APTITUDES AND COGNITIVE BENEFITS

If your day-to-day work doesn't make use of your dexterity aptitudes, there are good reasons to use them in hobbies. Aside from the fact that hands-on tasks can be relaxing and fun for someone with these aptitudes, fine motor activities can also have cognitive benefits. Outside research published in 2011 and 2014 found that engaging in manual hobbies (like arts and crafts, quilting, fine art, needlework, and knitting) was linked to a decreased likelihood of cognitive impairment and memory loss in older adults. This could be explained by the fact that many motor tasks and cognitive tasks activate similar parts of the brain, including the prefrontal cortex, cerebellum, and basal ganglia.

In a study of instructors and alumni of the French Culinary Institute, more than half of the chefs had high scores on the Tweezer Dexterity test.

As a group, professional musicians don't score particularly high on either of our dexterity tests. The ability they use to make music is a different type of dexterity than what our tests measure.

Dental schools often ask students to demonstrate how they've nurtured their manual dexterity abilities as part of the application process.

# HOW TO USE THE DEXTERITY APTITUDES

## IN WORK

### WITH A SPATIAL APPROACH

- Laboratory Research
- 3D Trades
- Repair and Restoration
- Physical Therapy
- Product Design
- Medicine and Dentistry
- Outdoor Sciences
- Agriculture and Farming
- Brewing and Viticulture

### WITH A NONSPATIAL APPROACH

- Culinary Arts
- Jewelry Design and Repair
- Studio Art
- Medical and Dental Technology
- Esthetics and Hair Dressing
- Nursing
- Makeup Arts
- Occupational Therapy
- Animal Training and Grooming

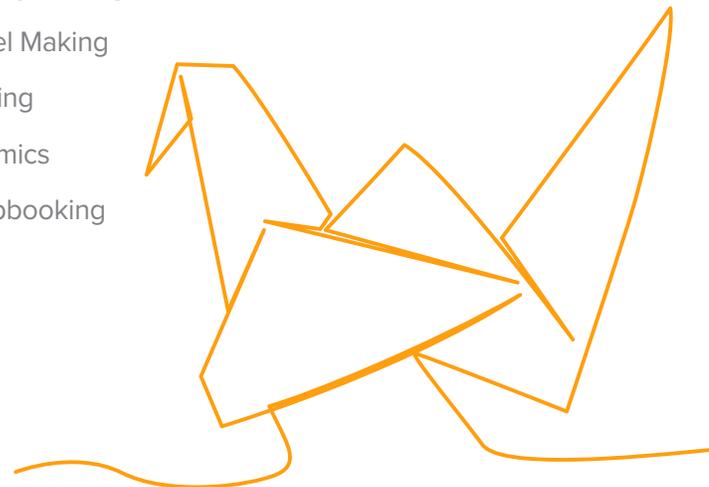
## IN HOBBIES

### WITH A SPATIAL APPROACH

- Woodworking
- Sculpture
- Molecular Gastronomy
- Origami
- Metalworking
- Home Improvements
- Car Restoration
- Permaculture

### WITH A NONSPATIAL APPROACH

- Gardening
- Sailing and Fishing
- Needlepoint and Sewing
- Jewelry Making
- Model Making
- Painting
- Ceramics
- Scrapbooking



## MAJORS, MINORS, AND COURSES FOR DEXTERITY APTITUDES

The Dexterity aptitudes might be used in hobbies or as part of a career pathway like nursing or dentistry. To get the most out of this approach, explore colleges or programs that emphasize a hands-on or experiential approach to learning or offer field work. Smaller schools and colleges that cater to unconventional learners often have more of these types of opportunities. You might also look for lab experiences or programs at trade schools.

### IF YOUR PATTERN IS SPATIAL

- Agriculture
- Dentistry
- Toy Design
- Permaculture
- Veterinary Science
- Medicine
- Physical Therapy
- Mechanics
- 3D Trades
- Electrical Engineering
- Architectural Modeling
- Woodworking
- Metalworking
- Sculpture
- Orthotics and Prosthetics
- Dental Prosthetic Technology
- Solar Installation

### IF YOUR PATTERN IS NONSPATIAL

- Nursing
- Occupational Therapy
- Culinary Arts
- Dental Hygiene
- Veterinary Technology
- Ceramics
- Weaving
- Art Education
- Costuming
- Theater Technology
- Recreational Therapy
- Printmaking
- Massage Therapy
- Acupuncture
- Athletic Training
- Art Restoration
- Cosmetology
- Merchandising
- Glasswork
- Locksmithing
- Watch Repair
- Medical Technology
- Forensic Technology

# 12 Grip



Activity



Adrenaline



Outdoors

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## THE TEST

A dynamometer is used to measure hand strength.

## THE APTITUDE

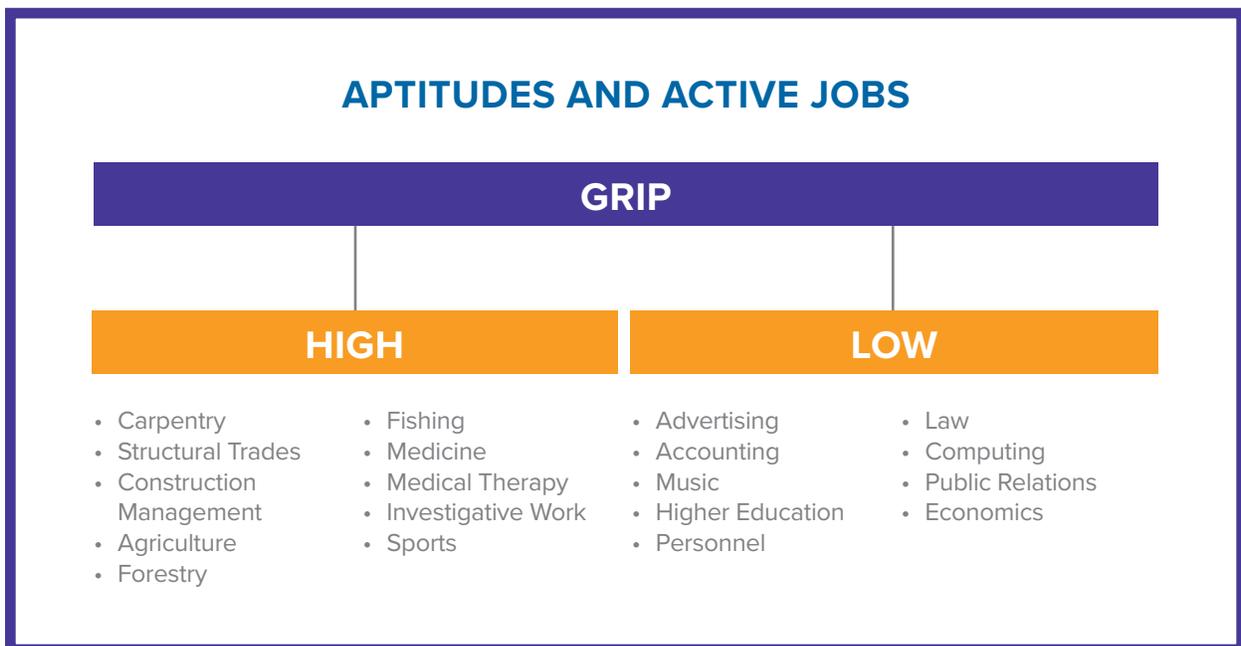
At various points since the 1980s, the Foundation has been exploring how to measure the impulse that some people feel towards physically demanding work through a test that measures static hand strength. For years Grip strength tests have been used to predict performance in active jobs like police work. Outside research indicates that police officers, firefighters, orthopedic surgeons, and others in physically demanding occupations tend to score higher than the general population in grip strength.

The Grip aptitude seems to be related to a feeling of physical restlessness or nervous energy. You may feel an attraction to adrenaline-based or outdoor activities. If you scored high in this area, you might gravitate towards work that lets you spend more time moving around or on your feet and less time sitting at a desk.

# WHO USES GRIP?

High Grip scores positively correlate with more physically demanding work like construction, and negatively correlate with more sedentary professions like accounting. Because of the differences between males and females in human physiology, Grip scores are based on sex.

The chart below shows the results from our most recent study into the Grip aptitude. As a whole, active or outdoor professionals tended to have higher scores on the test, and professionals who worked inside or at desks tended to score lower. If you scored high in Grip you can still find satisfaction in a desk job but might especially seek out chances to move around during the day, whether that's volunteering to give a presentation, meeting a client outside the office, or becoming a digital nomad.



One study showed that clients who score high in Grip were over twice as likely as low scorers to report that they engage in fully-active group sports like football, basketball, and soccer.

They were also less likely to report a preference for sedentary hobbies like reading and music.

# TIPS FOR HIGH GRIP

## IN THE WORKPLACE

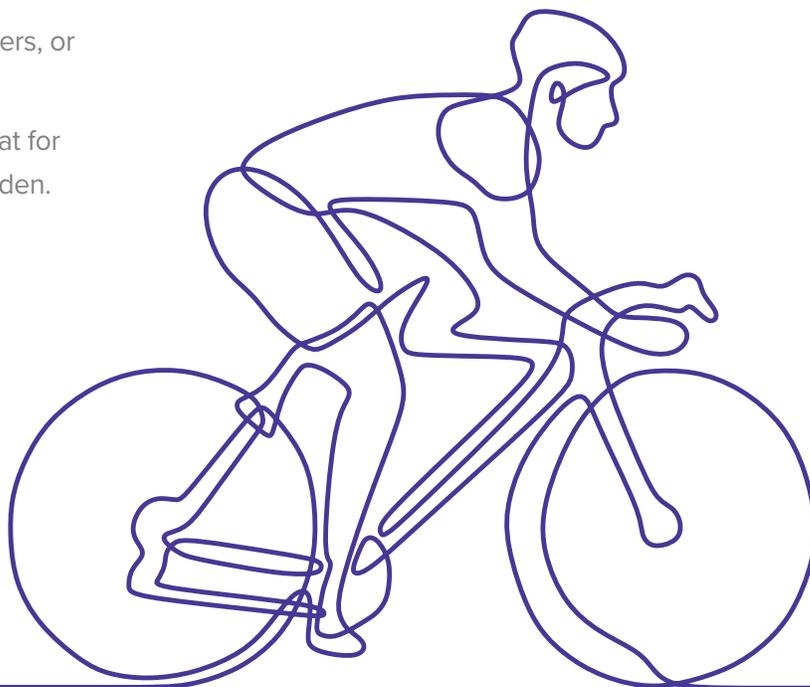
- Look for careers that involve working outdoors or traveling.
- Consider fields that involve a lot of movement, like coaching, nursing, physical therapy, construction, real estate, or law enforcement.
- Use a standing desk or trade in your desk chair for an exercise ball. Take the stairs or go for walks during your lunch break.
- Start or participate in a company fitness program.

## IN THE CLASSROOM

- Bike, walk, or skate to school.
- Avoid block scheduling if you can. Sign up for classes that meet for shorter periods of time throughout the week to minimize time sitting in one place.
- Explore alternative schools with project-based learning, outdoor activities, or apprenticeship programs.
- Join a sports team, outdoor club, or theater department.
- When you're studying, take frequent breaks to move around.

## IN DAILY LIFE

- Take up active hobbies like running, team sports, skydiving, rock climbing, community theater, or dance.
- Consider vacations that include an adventurous activity: a motorcycle ride through the desert, a tour of the tallest roller coasters, or canyoneering.
- Volunteer as a coach, build with Habitat for Humanity, or work in a community garden.



# Make it Active



IF YOU'RE INTERESTED IN

TRY



Writing



Travel Writing,  
Investigative  
Journalism

IF YOU'RE INTERESTED IN

TRY



Counseling



Wellness Coaching,  
Movement Therapy



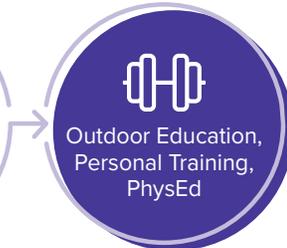
Business



Sales, Hospitality,  
Retail, Construction  
Management



Education



Outdoor Education,  
Personal Training,  
PhysEd



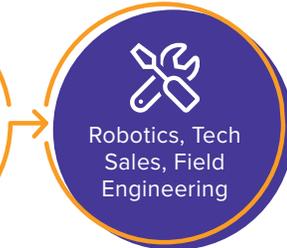
Law



Lobbying,  
Environmental  
Law



Technology



Robotics, Tech  
Sales, Field  
Engineering

## MAJORS, MINORS, AND COURSES FOR GRIP

A high Grip score indicates that you might feel more focused and satisfied when you have the chance to be active during the day. Below are areas of study that can lead to more active careers. You might also look at military colleges or join a Reserve Officer Training Corps (ROTC) program.

### IF YOUR PATTERN IS SPATIAL

- Aerospace Engineering
- Environmental Engineering
- Medicine and Dentistry
- Metalworking and Welding
- Archaeology
- Viticulture or Fermentation Sciences
- Agriculture
- Robotics
- Geology
- Forestry or Environmental Science
- Mechanics
- Construction Management
- Manufacturing Technology
- Agronomy
- Forensic Science

### IF YOUR PATTERN IS NONSPATIAL

- Adventure and Wilderness Therapy
- Adventure Education and Leadership
- Tourism and Recreation Management
- Kinesiology and Exercise Science
- Wildlife Management
- Wilderness Studies
- Nursing and Allied Health
- Criminology and Criminal Justice
- Theater and Dance
- Fire Science
- Culinary Studies
- Beauty and Wellness
- Real Estate
- Medical and Dental Technology

# 13

## Workplace Personality



Scope of Work



Collaboration



Roles

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### THE TEST

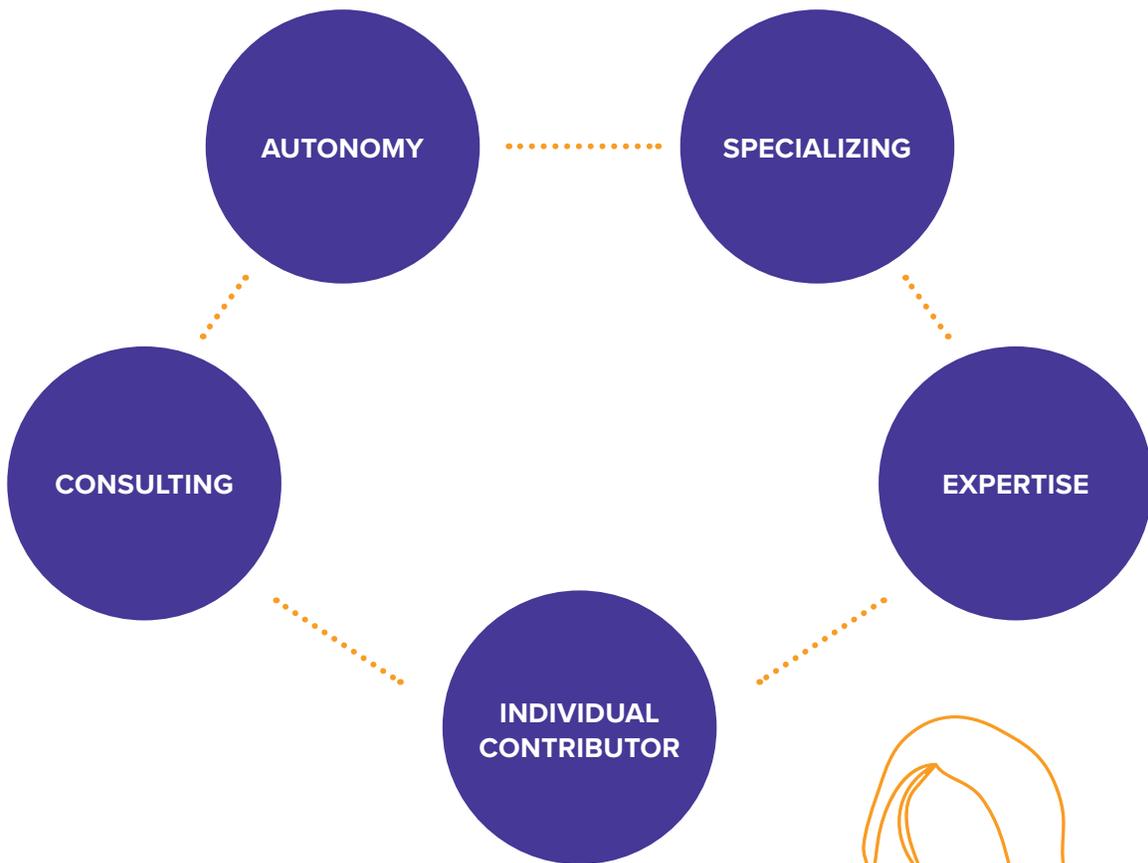
Workplace Personality is measured through a Word Association test. Examinees are read a list of common words and respond with the first word that comes to mind. The Foundation does not use our Word Association test as a traditional projective test, seeking to understand why clients give certain responses. We simply look at the type of response given.

### THE APTITUDE

In the early days of the Human Engineering Laboratory at General Electric, Johnson O'Connor began experimenting with a Word Association test. As he tested more and more people, an interesting pattern emerged. The majority of test takers tended to give one type of response to certain words, while a smaller number tended to give another type. The former group, which O'Connor termed Objective, tended to include salespeople and those who rose in management. The latter group, which he termed Subjective, tended to be composed of technical engineers and others in highly specialized jobs. We believe our test provides an indication of the approach an individual will naturally take to their work. If your aptitudes point you in a direction, your work approach can indicate how you want to work in that direction.

# THE SUBJECTIVE APPROACH

The Subjective approach is characterized by an individual, specialized way of working. If you score in the Subjective range, you may find you thrive in the role of an expert, depending primarily on your own efforts for success. You may enjoy having the latitude to make decisions as you see fit or ensuring the end product you are working with bears the stamp of your own individuality. Whether you choose to work alone or with others, you may be most comfortable in niche roles where you can share your deep knowledge. When working with other people, look for situations in which you can mentor, advise, or consult with others, particularly to help people who have sought your expertise.



## FINDING SUBJECTIVE PASSIONS

Many people who score Subjective see their work as an extension of who they are and can feel the most motivated when they care strongly about what they're doing. Think about what you enjoy learning and what kind of information you most want to share with others. That unique passion is often what drives the Subjective person to give 110% of their energy to their work. Here are some points to consider as you look for your Subjective passion:

- What problems do you want to spend your career solving? Thinking about a problem that feels personally meaningful can be a good starting place for discovering your passion.
- What energizes you? Most people who feel they're not interested in anything can name quite a few things they feel strongly about. What are those for you? Is there a seed of a passion there? For example, someone who gets angry every time they read about fraud might find a very satisfying career in consumer protection law.
- Have you given yourself permission to follow the threads of what interests you? Many people develop a passion for their work after they've put in the effort to become an expert in it.
- Are you actively learning about the world around you and trying new things? Your passion might be out there, but you haven't stumbled upon it yet. Reading, watching documentaries, listening to podcasts, going to museums, traveling, and taking classes are all ways to seek inspiration.

Don't mistake passion for the perfect job. No one loves what they do every single day. Passion is about what feels important and fulfilling to you.

Subjective scorers are often seeking a way to be the “go-to” person in their field and can be perfectionists when it comes to their work. This desire can sometimes lead them to feel like it's too late to start something new, especially if they think that other people have already achieved mastery there. Remember that time passes no matter how you spend it. Don't let the fact that you're not yet an expert stop you from using your aptitudes.

One study showed that theater artists (actors, directors, designers, playwrights, and stage managers) tend to score significantly more Subjective than other populations. No matter what profession you pursue, if you score Subjective you might want to feel like you've elevated it to an art form.

## THE SUBJECTIVE ENTREPRENEUR

Many Subjective scorers are naturally hard workers who feel especially restricted by micromanaging supervisors. They often dream of becoming their own boss and starting a business or service around a passion or cause they care about. Once you have enough expertise in your field, consider striking out on your own and building a small business that lets you remain directly involved in the product and operations. It can be gratifying for the Subjective scorer to feel ownership over what they do, and their natural inclination to throw themselves full force into their work can sustain them as they build something from the ground up.

Remember that a small business doesn't have to mean a physical storefront. Starting a small consulting firm, freelance service, or even a niche blog or social media account can all satisfy that entrepreneurial itch. If you're working within a larger company, you can also explore intrapreneurship opportunities by creating a new product line, department, or service within an existing organization.

### IF ENTREPRENEURSHIP ISN'T FOR YOU, CONSIDER THESE OTHER ROLES THAT COULD FIT THE SUBJECTIVE APPROACH:



- Professor
- Specialized Sales
- Advisor
- Consultant
- Advocate
- Researcher
- -Ologist
- Specialist
- Analyst
- Artist
- Lobbyist
- Coach
- Craftsperson
- Mentor

# THE SUBJECTIVE APPROACH

## IN THE WORKPLACE

- Look for smaller companies or departments where you can know and trust the people you work with.
- Carve out a niche for yourself within your area; seek autonomy in the workplace. Look for smaller networking events and come prepared with topics to discuss. Subjective scorers sometimes feel a little uncomfortable pitching themselves to others.
- Look for a mentor you trust and admire, or become a mentor yourself. Many people who score Subjective savor the chance to work one-on-one with someone they respect.
- Become a thought leader in your industry. Share your expertise in blog posts and speaking engagements.
- Avoid promotions that take you too far away from the work you love. You might find it frustrating to be responsible solely for managing others. Instead, pursue opportunities to earn a senior title or other specialized role.

## IN THE CLASSROOM

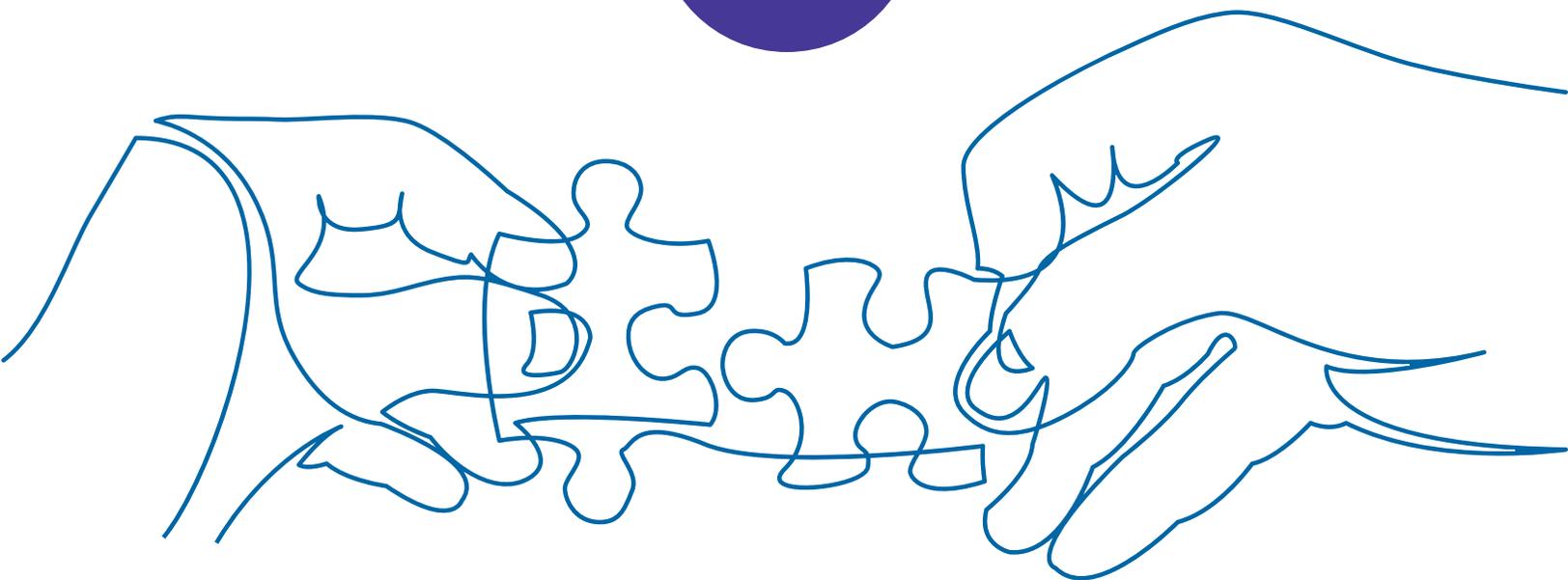
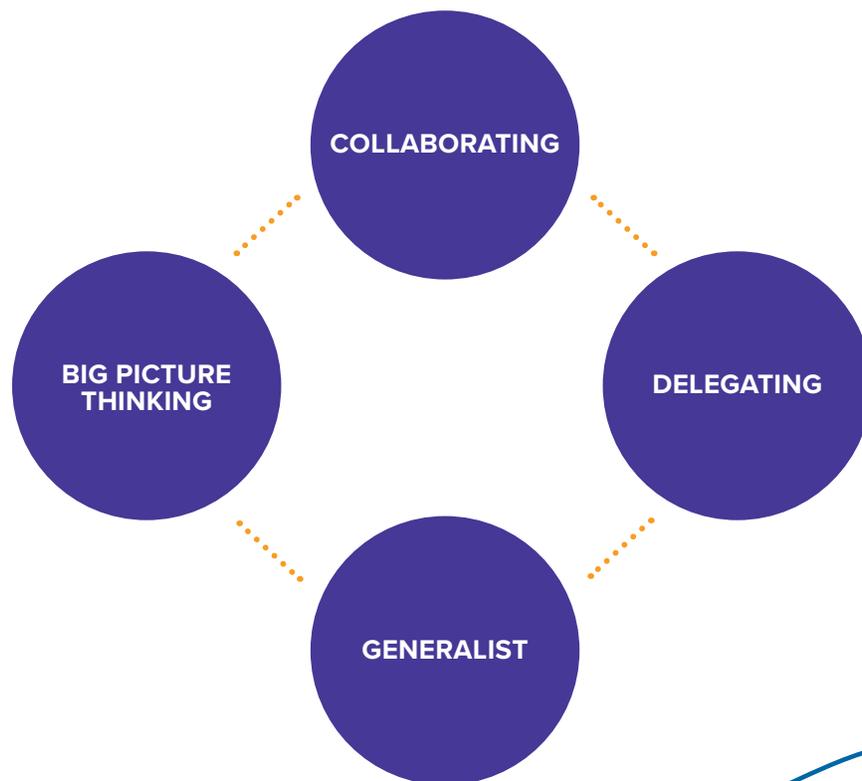
- If possible, be selective about who you collaborate with in group projects.
- Join an entrepreneurs club or start your own business. Start or join clubs, teams, or organizations related to a passion you have.
- Look for small schools, academic departments, and class sizes where you can be seen as an individual and have a chance to connect on a deeper level.
- Remember that high school forces you to be a generalist but you'll have more chances to specialize in college and work. You might feel especially frustrated by subjects you have no interest in, or teachers you don't get along with.
- Nurture relationships with professors you enjoy by visiting their office hours or working as a research assistant. Consider learning directly from someone you respect in an apprenticeship.

## IN DAILY LIFE

- Work to develop mastery in your hobbies and interests.
- Advocate for causes you care deeply about.
- Mentor, coach, or teach motivated learners in or outside of the classroom.
- Take classes in subjects that capture your interest.
- Volunteer as a tour guide of your city or a museum where you have the opportunity to share your knowledge.
- Turn your passion into a side business or nonprofit.

## THE OBJECTIVE APPROACH

If you scored on the Objective side of the scale, a key concept for you is collaboration. This approach suggests that you look for opportunities to work with and through others. This can happen if you work directly with clients and customers, as a member of a team, or in a managerial role. Another key concept is variety. People who score Objective often prefer jobs in which there are many tasks. Focusing too narrowly on only one aspect of work over the course of a career can be unfulfilling, as Objective generalists typically like roles in which they wear many hats. You might also take a big picture approach to work and be most satisfied working on the overall vision for a project or business, rather than the smaller details.



## MANAGEMENT

Objective scorers often gravitate toward leadership roles in management, a diverse and wide-ranging field. There are managers in almost every area, from art to human resources to banking to sports to education. The flexibility of the management pattern could allow you to work in a field or industry that also has personal meaning for you. Many managers like putting people in the right positions to help the team, coordinating the efforts of their own group or department, delegating tasks, sharing ideas and information with others, and using their ability to bring out the best in each member of the group.

Most, if not all, management positions are obtained by people who have education and experience in a particular field. Athletic Directors are often former athletes. Principals and school administrators most often come from teaching or other educational backgrounds. If you are considering management in a field that's new to you, you may want to volunteer or obtain nonmanagement work in that field to gain experience, then start on your road to becoming a manager, director, or supervisor.

**NOT EVERYONE WHO SCORES OBJECTIVE IS INTERESTED IN RUNNING THE SHOW OR MANAGING OTHERS. CONSIDER THESE OTHER PEOPLE-ORIENTED ROLES:**

- Teaching and Training
- Sales
- Account Management
- Facilitating
- Outreach
- Fundraising
- Coordinating
- Counseling
- Mediating
- Customer Service
- Politics
- Producing



## THE OBJECTIVE APPROACH WITH STRUCTURAL VISUALIZATION

The combination of Objectivity with Structural Visualization indicates potential satisfaction in working with others (either as part of a team or leader of a group) in a field that challenges your 3D thinking ability. One outlet for this pattern of scores is management in a 3D work setting. Managing involves working collaboratively, coordinating people and activities, and being able to delegate tasks effectively. Having an understanding of the spatial aspects of the work would also be important for anyone working or managing in a technical setting. In order to use both of these traits, you need to work with both people and with things, and it is not always easy to find the right balance. One approach is to focus on first getting the training to work in the spatial field of your choice, but remember that you may be most satisfied once you're also working with or supervising people. If you become a director or department head, remember that you also need to stay close to the action. Look for technical supervision jobs or highly collaborative environments in 3D fields to find a fit for both of these aptitudes.

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## THE OBJECTIVE INTROVERT

If you scored Objective but also identify as an introvert, the two approaches can initially seem at odds. Keep in mind that we don't associate our workplace personality test with either introversion or extraversion. There are plenty of people who score Objective but also need a break from others to recharge. There are a few ways to approach this experience:

- Look for smaller collaborative work environments or even one-on-one work where you still have the experience of “give and take” with another person.
- Think carefully about who you want to work with. Some people get a lot of satisfaction out of joining a team of like-minded people.
- Do solo work in the company of others. One client we worked with was a fiction writer who shared her work in a close-knit writers workshop once a week.
- Remember that scoring Objective points to being a generalist as well as a collaborator. Someone who works on educational policy, for example, might be alone at their desk for part of the day but still knows they are contributing to the bigger picture of education access and reform.
- Don't underestimate your role in creating an environment that makes collaboration possible. People who score Objective don't always identify themselves as natural leaders and sometimes prefer to give credit to the team.

# THE OBJECTIVE APPROACH

## IN THE WORKPLACE

- Look for larger companies or departments that give you more opportunities to collaborate. If you have entrepreneurial aspirations, consider starting a business with a partner so you don't feel like you're chasing a dream alone.
- Reach for management and leadership positions. Look for management training programs.
- Approach career planning from the perspective of who "your people" are. For some Objective scorers, team or work culture fit is a top priority.
- Avoid "work from home" and "department of one" situations, if you can. You might find them isolating. If you do work remotely, take advantage of coffee shops or shared workspaces, so you can be around the energy of others.
- Seek opportunities to hold weekly meetings, staff lunches, and other chances to bounce ideas off your colleagues.
- Look for liaison or facilitator roles. You might be a natural at customizing information for different audiences.
- Consider work that gives you a broad scope of influence. Work that impacts a large number of people could be very satisfying for an Objective scorer.

### Ask yourself:

"Who are my people? Who do I want to work with?"

## IN THE CLASSROOM

- Form study groups, tutor others, or take your books to the library or coffee shop to keep yourself motivated when studying.
- Seek leadership experience in a part-time job, student government, clubs, or volunteering.
- Avoid limiting yourself early in your college career. You're a generalist who might prefer a larger university setting or an interdisciplinary path.
- Start networking early in your career. You'll likely enjoy having a large network to pull from.

## IN DAILY LIFE

- Give yourself permission to dabble. If you have a lot of different interests, you might enjoy learning a little about all of them instead of diving deeply into one area.
- Volunteer in your community: Work on grassroots campaigns, join your neighborhood council or the board of a nonprofit, or run for office.
- Make solo hobbies more collaborative: Start a book club, sign up for a writers workshop, join a club for car enthusiasts, or play in a local sports league.

# THE INTERMEDIATE APPROACH

If you scored Intermediate, you're in the range between the Subjective (individual specialist) and Objective (collaborative generalist) ends of the workplace spectrum. When asked which approach they identify with more, people who score Intermediate often see themselves as a little bit of both.

## SPECIALIZING AS AN INTERMEDIATE SCORER

We typically recommend that someone who scores Intermediate consider finding something they're interested in and gaining in-depth knowledge in that field or topic. The reasoning behind this is practical. Specializing, particularly in the early stages of your career, can provide more flexibility in the future. Let's say you're interested in how machines work. If you train as an engineer, you'll have the option both to go further in that direction as a mechanical or robotics engineer, or, if you decide that you prefer a more generalist approach, you can build on that expertise to become a manufacturer's representative or executive. Conversely, if you begin in a very broad role like "salesperson," you would need to gain the training and expertise to become an engineer. Think of your approach as aligning more closely with the Subjective score as you begin your career. As you gain work experience, observe whether you thrive in that specialized space or would gain more satisfaction from taking your expertise in a broader direction.

## FINDING BALANCE

If you find yourself identifying with both the Objective and Subjective ways of working, consider looking for a balance between the two. One way to do that is to seek out opportunities to both have your own specialized projects and share them with others.

Here are three illustrations of this hybrid approach:

- A university professor with both solo research projects and classroom time.
- A small business owner who splits their time between product development and marketing their business.
- A copywriter or graphic designer whose individual contribution becomes part of a larger team project.

The Intermediate approach can be a blended one, including both the passion-driven ethos of the Subjective score and the consensus-building nature of the Objective score.

# 14

## Vocabulary



Communication



Reading



Knowledge

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### THE TEST

Examinees are tested on their knowledge of a selection of vocabulary words in a multiple-choice test. Scores are based on accuracy and age.

### THE MEASUREMENT

The Foundation's research shows that vocabulary is not an innate aptitude but a measure of general word knowledge. No one is born with a large vocabulary — acquiring a strong vocabulary is a fluid, lifelong process that requires active effort.

While there is a positive correlation between reading and vocabulary level, general exposure to words is also a factor. Where you grew up, who you spend your time with, and where you went to school can also affect your vocabulary development. Anyone can improve their vocabulary, and we encourage all of our clients to do so, no matter how they score on the test. Vocabulary does and should grow with you over time. It is generally understood that you'll know more words at fifty than you do at fifteen.

## A TYPE OF KNOWLEDGE

If vocabulary is not an aptitude, why do we test for it? A large vocabulary can be part of an overall pattern that predicts success. Vocabulary is an expression of learning and a reflection of how you have interacted with and absorbed information. Someone with a high vocabulary score usually hasn't memorized definitions at random. Rather, they have often read extensively and sought out information about the world around them, soaking up the meanings of words as they went along. Vocabulary is a measure of knowledge, certainly, but is also a byproduct of the experience of approaching life with curiosity and a learning mindset.

## A COMMUNICATION TOOL

Johnson O'Connor called words our "tools of thought." Outside research has found that it's nearly impossible to think without using words. That means the words we know shape our thoughts and ideas, as well as our ability to communicate them to others. The more words you are able to understand and use appropriately, the more expressive you can be. You will also be more likely to make yourself understood. A strong vocabulary is the mark of a flexible communicator.

Someone who has a low vocabulary score is often literally at a loss for words. We sometimes underestimate how often we use words to represent ourselves to the world in resumes, cover letters, job interviews, and everyday discussions. Some clients who have scored in the very low range on our vocabulary test have shared experiences about censoring their ideas at work when they weren't sure if they were using a word correctly, changing their majors when it was too difficult to understand their textbooks, and floundering at job interviews when they couldn't find the right words to explain their experiences. Learning in general, and the habit of learning new words in particular, builds confidence and opens doors to you that you may otherwise miss.

## VOCABULARY IN SCHOOL

Vocabulary scores have been found to correlate with years of education, as well as educational attainment beyond a Master's degree. In studies related to our Foresight (goal-setting) aptitude, we also found that a high vocabulary score can compensate for the impact that low Foresight can sometimes have on educational attainment.

Scores on our vocabulary tests have also been found to correlate with scores on not only the reading and writing sections of the ACT admissions test, but also with scores in math and science.

## VOCABULARY AT WORK

Studies of the vocabulary levels of business executives (one done in the early years of the Foundation and another done almost fifty years later) demonstrate that an extensive vocabulary

is positively correlated with success in business. These studies looked at company presidents and executives, and found that as a group their average vocabulary levels were higher than other occupations in the study. In fact, only twelve percent scored below the average of those with similar levels of education.

## HOW WE LEARN WORDS

Words in the English language can be ordered in terms of their relative difficulty. Common words are those known by most if not all speakers of the language. A difficult word is one that is known and thoroughly understood by few people.

We all learn language in this order of difficulty. We tend to know and be comfortable using the majority of words up to our own personal limits. The words just beyond this point are words we have only seen or heard a few times and don't fully know, and beyond that, words we are completely unfamiliar with.

It is most effective to put energy into learning new words that are just at our upper limit of vocabulary knowledge, since these words are more familiar to us and seem more applicable to our lives. Johnson O'Connor called this limit of our vocabulary the "Frontier of Knowledge."

## FOUR BASIC STEPS TO A BETTER VOCABULARY

Anyone can improve their vocabulary. A strong vocabulary will help you better use your aptitudes and increase your chance of success in any field. Here are four steps you can take to build yours:

1. **PAY ATTENTION TO WORDS**, especially the ones that are familiar to you but that you can't quite define.
2. **READ** (books, websites, anything that interests you); **WRITE** (journal, blog, or write on social media); **LISTEN** (to the radio, podcasts, lectures, or audiobooks).
3. **LOOK UP WORDS** you don't know when you come across them. Highlight the entry in a dictionary or keep a list of the words you've looked up.
4. **STUDY, REVIEW, AND USE WORDS REGULARLY.** Once you have begun looking up words and you know which ones to study, vocabulary building is a matter of reviewing the words regularly until they are fixed in your memory. Use flashcards or vocabulary-building games and apps.

"An extensive knowledge of the exact meanings of English words accompanies outstanding success in this country more often than any other single characteristic which the Johnson O'Connor Research Foundation has been able to isolate and measure."

— Johnson O'Connor

# 15 Interests



Themes



Values



Motivations

As you spend time investigating the kinds of work suggested by your aptitude pattern, take time to reflect on the idea of what *sparks your enthusiasm*. Remember that careers suggested by your pattern are only examples, not comprehensive listings. While abilities may point you in many directions, they must be fused with your passions to determine the path forward.

Our research shows that aptitudes are both stable over time and closely connected to success and satisfaction in a field, but your interests will determine how best to utilize your pattern to achieve this success. Aptitudes are one piece of the career puzzle, alongside your values, beliefs, and interests. The ideal situation is one in which all of these pieces come together.

A professor of bioengineering and a toy designer might share similar aptitude patterns, but their careers are fueled by very different passions.

## THE INTERSECTION OF APTITUDE AND INTEREST

We have found that there is often, but not always, a correlation between aptitudes and interests. When there is a significant overlap between the two, the situation can be straightforward. If your aptitude pattern serves as a confirmation for your career or educational plans, you can start on your chosen path with the confidence that comes from self-knowledge.

When the connection is not so clear, however, one option is to break down your current interests and see what related roles might best fit your aptitudes. Do you love numbers or science? Art? Sports? All of these areas have career options with different core responsibilities that use different aptitudes. For example, in sports a general manager of a team uses data and analysis to put together a winning team, while someone on the marketing side might use creativity and design skills to promote a team or player. Keep this in mind and sometimes an interest that you never thought of as a feasible option can hold opportunities that lead to a very fulfilling career.

Remember that aptitude testing isn't meant to limit your options but to encourage you to find outlets for your natural abilities. If your college major or career plans don't fit your pattern, it can be helpful to examine what lies at the heart of your interest in that path:

- Is it related to the actual activities involved in your current career or major choice?
- Is it about the career itself or the desire to accomplish something related to your values?
- Is it connected to a particular lifestyle you see for yourself?

When you break down your motivations, you allow yourself to open doors to other areas that can fill the same needs but in a way that better aligns with your natural talents.

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## DISCOVERING NEW INTERESTS

Tuning in to what you choose to do in your free time or for fun can be one way to notice parallels between your interests and your aptitudes. Ask around: Sometimes there are themes you return to that may seem obvious to your friends and family but not to you. It can also be useful to explore brand new areas to see what possibilities lie waiting to be discovered.

### TO JUMP-START A NEW AREA OF INTEREST, TRY...

- Taking a class at a community center, local college, or online
- Looking for specialized groups through meetups or social media
- Joining or starting a club with friends who have similar interests
- Volunteering at a related event
- Seeking out nonfiction reading or listening material on the subject

While your aptitudes are innate and stable, your interests are evolving. Examining your aptitudes with an open mind can accelerate this evolution, and provide a renewed sense of purpose as you travel your unique career path.

# Closing Thoughts

As a research institute, we're interested in what the data tells us. Since the Foundation's inception in 1922, we've found our test scores correlate with factors like graduation rates, school grades, and career longevity. It's safe to say that you're more likely to find success in the types of work that you have an aptitude for, but what defines career success? For most people, it's more than the size of a paycheck or the number of years in a job. People come to us in search of insight into something that's much more difficult to quantify — career satisfaction.

Current thinking in positive psychology indicates that the experience of complete engagement in a task (what the researcher Mihaly Csikszentmihalyi called “flow”) plays a significant role in whether or not we enjoy our careers. Flow is far more likely to occur when we find what could be described as a Goldilocks challenge: one that's not so easy that it's boring and not so difficult that achievement feels out of reach. This is where your aptitudes come into play. Matching work with your talents creates the conditions to stretch yourself in a way that feels “just right” for you.

It's not much of a leap, then, to argue that aptitudes are more than the qualities that make our jobs easier; they're the guideposts we can follow to find meaningful ways to spend our days. Every year advances in technology create new jobs and opportunities, but the human mind is evergreen. The same gift for three-dimensional thinking was likely used to build both the pyramids and the modern computer. The ability to generate ideas that prolific writers like Shakespeare and Charles Dickens drew on hundreds of years ago is the same aptitude you might use in digital marketing today. In a rapidly changing professional landscape, your aptitudes can be the constant, pointing you toward the paths that will give you not only the best chance of making your unique contribution to the world but a sense of satisfaction along the way.

“Enjoyment appears at the boundary between boredom and anxiety, when the challenges are just balanced with the person's capacity to act.”

– Mihaly Csikszentmihalyi



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