

Developing the Cognitive Tools FOR Learning

Cognitive skills equip students to learn complex tasks, perform mental math problems, ignore distractions, follow multiple-step directions, and plan and think strategically. Equipping Minds gives the cognitive tools for learning: working memory, processing, comprehension, reasoning, attention, and executive functioning skills. You will learn to strengthen these skills that generalize to academic, verbal, and nonverbal abilities and IQ. Feuerstein defines cognitive functions as “thinking abilities” that can be taught, learned, and developed. Hence, they are the prerequisites of thinking and learning. There are three phases of cognitive functions: input, elaboration, and output. Trained teachers and parents can use this model to understand better and help the child who is experiencing learning difficulties. The emphasis is on strengthening cognitive abilities to make learning successful and ultimately to reach God's full potential for our students for His purposes and glory.

We also need to *understand and develop the cognitive tools FOR learning*. When learning challenges are present, cognitive skills need to be developed and strengthened. * Do you teach something one day, and the next day, it's like they never heard it? Do learners have difficulty following multiple-step directions? Can they pass a spelling test but misspell the same words when writing? Do they have difficulty expressing themselves in writing? Verbally? Are they easily distracted?

Our Son's Story: <https://equippingminds.com/our-story/>

Biblical Worldview of Human Development: It impacts how we view learners and human development. The human mediator/ teacher is key.

A naturalistic view of human development has been prevalent for over 300 years and has gone unchallenged. Many educators have been looking at learners with neurodevelopmental disorders through Piaget's (1896-1980) eyes rather than God's. Seemingly, the naturalistic view of humanity and human development has been widely accepted. Many religious educators have come to accept the theories of human development embraced by secular educational systems that discount spirituality and have a naturalist worldview rather than a biblical view of human development. Developmental theories have informed our perspectives, expectations, and limitations of learners who have intellectual, behavioral, and physical challenges.

In the 1600s, the father of modern education and reformed theologian, John Amos Comenius (1592-1670) developed a system of progressive instruction according to the stage of human development a learner had reached, which was a precursor to developmental psychology. Piaget states, “Comenius was the first to conceive a full-scale science of Education.” While

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Piaget had great admiration for Comenius' work, he dismissed and misunderstood Comenius' theistic worldview. According to Jean Piaget, Comenius' seventeenth century views on metaphysics and theology as presented in *The Great Didactic* were not relevant in the twentieth century.

In *The Great Didactic*, Comenius presents the first principles of human development and instruction as he brings theology, education, and human development together. Chapter 1 titled, "Man is the highest, the most absolute, and the most excellent of things created," admonishes the reader to, "Know thyself, O man and know me, me the source of eternity, of wisdom and of grace; thyself, my creation, my likeness, my delight." As man is the center of God's creation, Comenius believes, "Man is naturally capable of acquiring a knowledge of all things, since, in the first place he is the image of God. "Comenius' insights into the potential and unlimited capacity of the human mind truly were hundreds of years before his time, as well as the scientific discovery of neuroplasticity as he states, "The mind; neither in heaven nor anywhere outside heaven, can a boundary be fixed. "Comenius reminds the reader that God is not a respecter of persons, and no one should be excluded because of their intellect. He believed that those with weak intellects need assistance by a mediator: "We do not know to what uses divine providence has destined this or that man; but this is certain, that out of the poorest, the most abject, and the most obscure, He has produced instruments for His glory."

Read full journal article ["Naturalist or biblical worldview of human development."](#)

Understanding the Tools for Learning: Cognitive Skills Defined

Memory

- **Short-term memory** is the ability to screen out unimportant information, to keep important information for further processing (1/1000 of a second), and to hold onto information for up to 30 seconds until you decide to throw it out or send it to your working memory (desktop) for further processing.
- **Working memory** is the ability to hold two or more pieces of information in the mind while performing a mental operation or manipulating the information such as listening and taking notes, reading, spelling, writing, and mathematics. Working memory is a stronger predictor of academic success than an IQ score.

Signs of weak working memory:

1. A student may read a word and forget it a few lines later.
2. Difficulty following multistep directions.
3. Difficulty keeping multiple sounds and letters for reading and spelling.
4. Difficulty remembering basic math facts and steps to math problems.

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5. Difficulty listening and taking notes.
 6. Difficulty making decisions.
 7. Difficulty getting thoughts on paper and remembering the sequence of a story, grammatical rules, spelling, and letter formation.
 8. Difficulty remembering site words.
- **Long-term memory** is the ability to store and recall information for later use. This may involve recalling sequences, math facts, or rules, reproducing a design and/or several pieces of information in an organized fashion.

Does the student have difficulty recalling information?

Attention

Visual and auditory sustained attention is the ability to stay on task for a sustained period.

Visual and auditory selected attention is the ability to attend to one input without being distracted by other inputs.

Divided attention is the ability to attend to two activities simultaneously, such as taking notes and listening to the teacher.

Flexible attention is the ability to shift focus quickly when necessary.

Processing

- **General processing** speed is the rate at which the brain handles information.
- **Visual processing** is the ability to perceive, analyze, and compare images by seeing the differences in size, color, shape, distance, and orientation of objects. You can create a mental image or a movie in your mind. Tracking and convergence of eyes
- **Auditory processing** is the ability to hear the differences in sounds, break words apart, and manipulate and analyze sounds to determine number, order, sequence, and the sounds that go with each word (phonemic awareness). This is necessary for reading.

Logic and Reasoning

Logic and reasoning give the mind the ability to form a logical and practical plan, prioritize, analyze, and solve problems, handle setbacks, and learn from mistakes, failures, and conflicts.

Executive Functioning

There are three components of executive functions: inhibitory control, working memory, and cognitive flexibility.

Comprehension

Comprehension is the ability to remember and understand what you read. One can “see” the details of a passage, as well as understand the general concepts. The ancient Greeks were the first to grasp the importance of imagery, or, as we may say today, “making a movie in your

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mind,” when reading or listening. Many students are taught to simply read the questions at the end of the chapter and find the answers which is NOT reading comprehension.

Signs of Weak Comprehension:

- Difficulty following directions
- Getting the parts but missing the whole
- Information seems to go in one ear and out the other
- Difficulty with written and oral language comprehension
- Difficulty with expressing language orally and in writing.
- Difficulty grasping humor.
- Difficulty with abstract thinking

It is important to realize that full prefrontal cortex development only occurs once you are approximately 25 years of age. You will see “immature” behavior such as difficulty controlling impulses, inability to predict the consequences of actions or see cause-and-effect relationships, and lack of motivation. Handling stress is also very difficult for children and adolescents. Trauma greatly impacts learning.

1. Learning differences refer to the diverse ways and rates at which students learn.
2. Learning difficulties refer to factors such as personal or family trauma, ineffective instruction, absenteeism, learning in their second language, and inadequate support at home.
3. Learning disabilities refer to students of average or above average intelligence who have a discrepancy between their potential and performance. Thirty-three percent of students are diagnosed with a *Specific Learning Disorder*, which combines the diagnosis of dyslexia or reading disorder, dyscalculia or mathematics disorder, dysgraphia or a written disorder, and learning disorder not otherwise specified.

How can we develop these cognitive skills?

Neuroscience research confirms the brain can change with the right tools and instructional methods. Cognitive Psychologist Reuven Feuerstein believed a human mediator is essential to take the learner beyond the natural limitations to reach his or her full cognitive potential and generate new cognitive structures. Higher-order cognitive skills and executive functions are

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developed through this experience. The mediated learning experience (MLE) is an interaction between the learner and the mediator who possesses knowledge and intentionally conveys a particular skill or meaning. The learner is then encouraged to relate the meaning to another experience or thought. Meaningful human interaction with a mediator also impacts social and emotional development. All teaching is not mediation, but all mediation is teaching.

Stroop Effect- *Cognitive competition between two conflicting stimuli and interruptions of irrelevant stimuli while performing a task. It requires processing, selective attention, working memory, and cognitive flexibility, known as executive functions.

***N-back task-** Requires storage and continual updating of information plus interference control.

The methods and games you will learn today have been used with children and adults of all ages and abilities. The cognitive gains have been generalized to academics, and those results are published in peer-reviewed journals. <https://equippingminds.com/research/research-studies/>

Since 2009, I have been developing cognitive games that use numbers, colors, letters, shapes, sounds, and images. These cognitive skills are increased by taking what the student knows and impacting reading, math, writing, language, social skills, attention, self-regulation, and behavior.

Visualization of letters is foundational for reading and spelling.

Visualization of numbers is foundational for math.

Visualization of images is foundational for comprehension.

This does NOT come by academic tutoring.

Play is an incredibly powerful tool for brain development. "It takes 400 repetitions to create a new synapse in the brain-unless it's done with play, in which case, it takes between 10 and 20 repetitions." Dr. Karen Purvis

"I will strengthen you and help you." Isaiah 41:10 Tell your students, "I will help you." "Stop and Think." When they make an error, say "check." "Hard is good."

1. Tic Tac Toe with numbers, letters, animals, colors, and presidents to impact reading, math, spelling, logic and reasoning, visual-spatial skills, comprehension, and self-regulation.
2. Blink, Equipping Minds cards, and a deck of cards are foundational for increasing processing, working memory, and cognitive flexibility.
3. Stroop Animal Page increases a learner's ability to follow multi-step directions and say, **"I see you."**

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4. Number Hunt 1-5 increases number sense, handwriting, visual tracking, math, and executive functioning.
https://www.youtube.com/watch?v=GYPnO2Hd_Og
5. Vowel Hunt improves rapid naming, working memory, reading, and phonemic awareness <https://www.youtube.com/watch?v=pUPGwsKy8WU&t=41s>
6. Arrows impacts visual processing, executive functioning skills, directionality, reading, and writing.
7. Aristotle's Ten Categories are the foundation for intelligent thinking. Stare Cards and **Yo, Millard Fillmore** can be used to impact comprehension, social skills, language, and writing.
8. Spot It increases visual and auditory memory, language, and grammar.
9. Color Code: planning, visualize transporting, and visual spatial reasoning.

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A	B	C
D	E	F
G	H	I

A	B	C
D	E	F
G	H	I

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1	2	3
4	5	6
7	8	9

1	2	3
4	5	6
7	8	9

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Tic Tac Toe - President



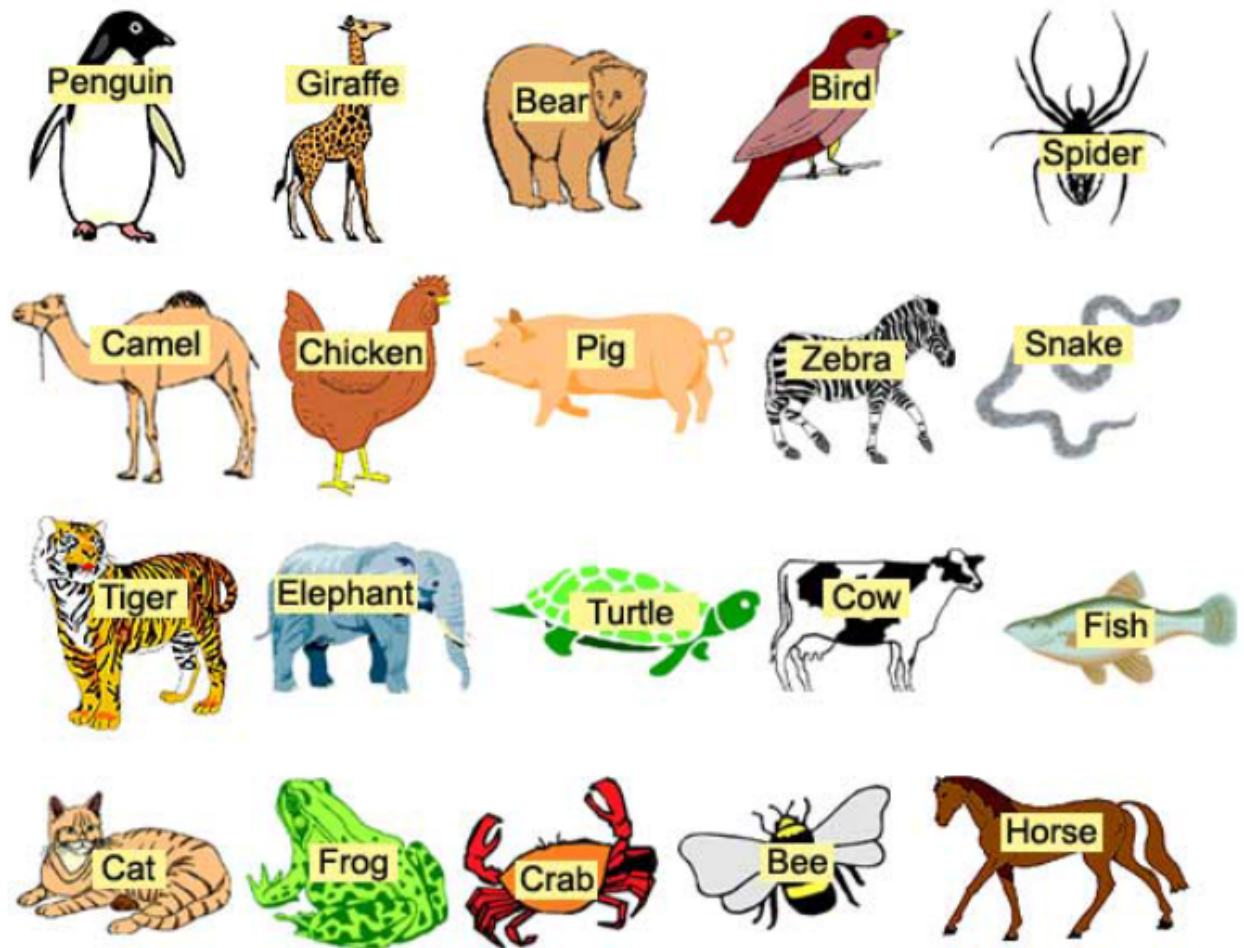
Watch the “Yo, Millard Fillmore” video on youtube:

https://www.youtube.com/watch?v=L-p_CINFJwE

Purchase the book on Amazon.

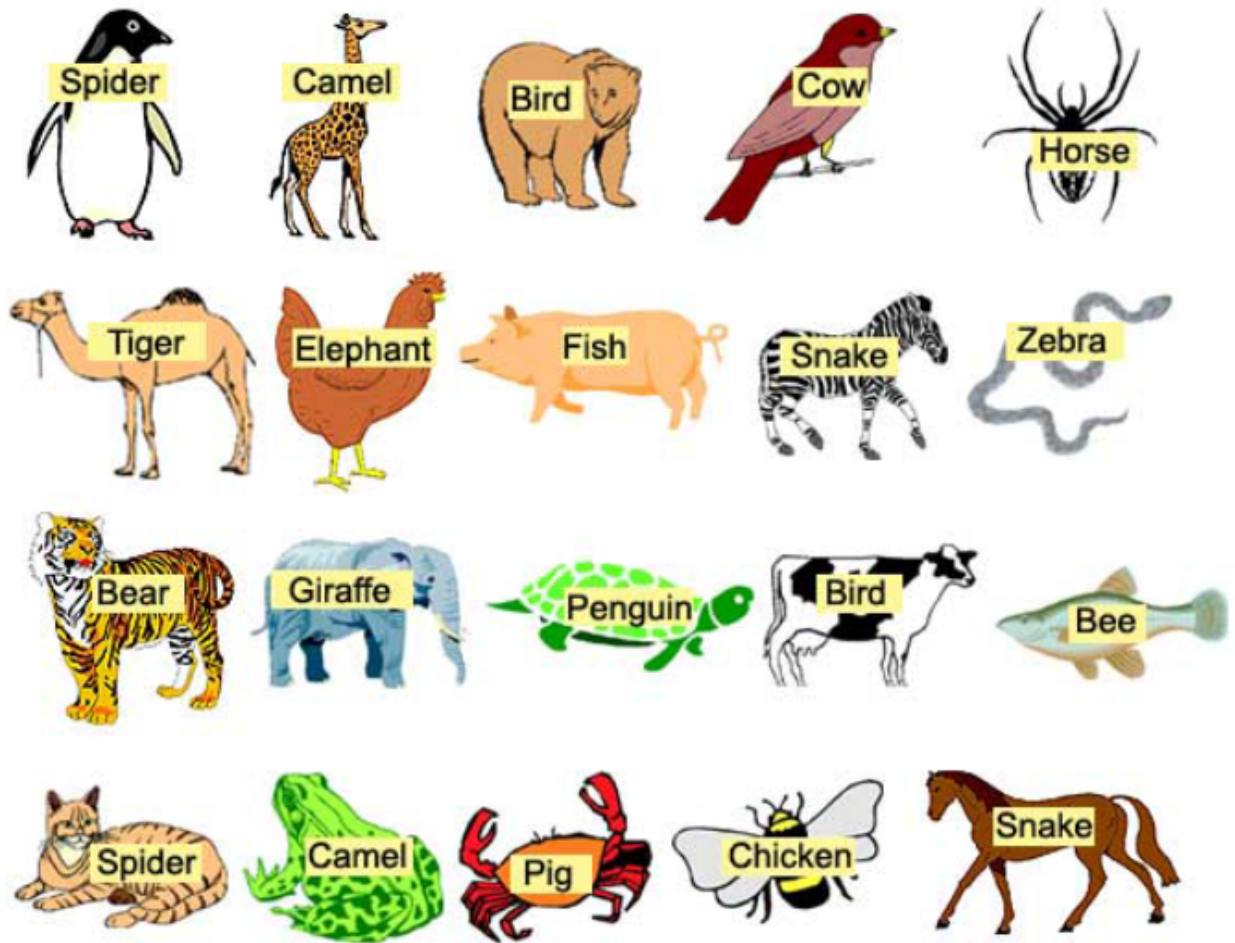
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Animal Set 1



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Animal Set 2



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2	1	5	4	1	3
3	4	1	2	5	4
1	4	3	5	2	5
3	1	5	4	3	2
1	3	4	5	2	1
3	1	4	2	5	3
2	4	3	2	1	5
4	1	5	4	3	2

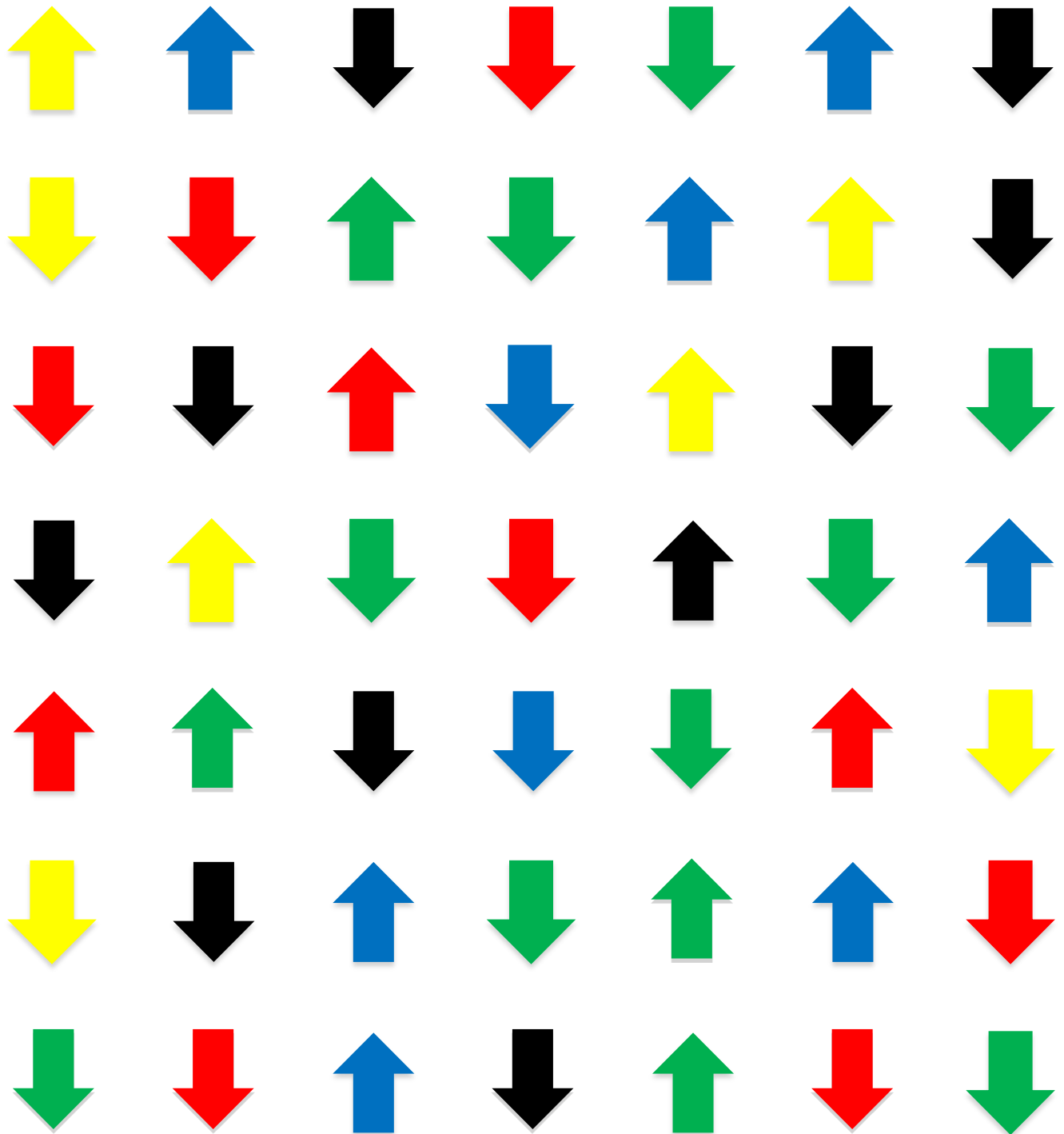
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Vowel Hunt with Colors

a	e	i	o	u	e
i	o	a	u	e	o
e	u	o	a	i	a
o	i	a	e	u	i
u	a	e	i	o	u
a	e	i	o	u	o
o	u	a	i	u	e

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Colored Arrows: Up & Down and Left & Right



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Aristotle & Socratic Questions for Mediated Learning

Ask these questions when beginning a lesson and addressing a problem. These support the Cognitive Functions of Reuven Feuerstein and are the foundation of Equipping Minds.

Collecting	Processing	Expressing
<p>What or who do you see, hear, feel, taste, touch, and smell?</p> <p>What can you visualize or imagine in your mind?</p> <p>What is the name of what you see or are thinking?</p>	<p>What am I to do?</p> <p>Problem, what problem?</p> <p>What do you need to figure out?</p> <p>What is relevant to the problem?</p> <p>What is needed, and what can be ignored/omitted?</p>	<p>What does the other person believe and why?</p> <p>How does the other person feel?</p> <p>Can you imagine how you would feel in their position?</p> <p>How would the other person want to be viewed and treated?</p>
<p>Where are you starting?</p> <p>Do you have the correct information and materials?</p> <p>What parts do you need, and what order will you need to follow to make the finished product?</p>	<p>What is similar?</p> <p>What characteristics are different?</p> <p>Consider: number, color, shape, size, direction, position, feeling</p>	<p>Have you thought through what you want to say or write?</p> <p>Are your words relevant to the situation?</p> <p>Is your language clear to the audience?</p>
<p>What do you know to be true, or what is constant and does not change?</p>	<p>What different categories do you see?</p>	<p>Do you need to take a break and attempt later or tomorrow?</p>
<p>What is to your right?</p> <p>What is to my right?</p> <p>If you are facing in this direction, what is to your right? Left? Front? Back?</p> <p>East? West? North?</p> <p>South? Northwest? Southeast?</p>	<p>How are these related to each other?</p> <p>Ask: What is your plan? What are the steps you will follow and the reasons?</p> <p>Avoid trial and error! Have a plan.</p>	<p>Perseverance! <i>“Continuous effort—not strength or intelligence—is the key to unlocking our potential.”</i></p> <p>—Winston Churchill</p> <p><i>“You will never do anything in this world without courage. It is the greatest quality of the mind next to honor.”</i>—Aristotle</p>
<p>When do you see this happening – past, present, future?</p> <p>How long did the event occur?</p> <p>In what order did it happen?</p>	<p>Does this make sense?</p> <p>If this is true, then what else must be true?</p> <p>Are there different possibilities?</p> <p>How can you see if this is true?</p>	<p><i>“If we all did the things, we were capable of doing, we would literally astound ourselves.”</i></p> <p>—Thomas A. Edison</p> <p><i>“Many of life's failures are people who did not realize how close they were to success when they gave up.”</i></p> <p>—Thomas A. Edison</p>

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Aristotle's "Ten Categories of Being" and "Talking Points"

Reading comprehension is the ability to "see pictures/images" of what you're reading. "What did you see happening?" Keep each of these areas in mind when reading to increase your understanding and memory. Begin by describing pictures.

What/Who Object, animal, person "What is the main thing or person you see?"	Quantity Number or other measurable characteristic Age of person Weight "How many do you see?" "How old is the person?" "What is the weight?"	Quality Size, color, shape, smell, sounds, taste, texture "How big?" "What color(s) do you see?" Describe the shapes you see.
Action "What do you see them doing? What do you hear?" (talking, singing, yelling...)	Place Where/location "Where do you see him walking, playing, etc.?" "What else do you see besides the boat?" (cloudy sky, waves, dolphins leaping up, etc.)	Time/When Past, present, future Morning, afternoon, evening Length of time- 5 minutes, hour, month, year Summer, winter, spring, fall "When do you see this happening? Early morning, at night, a long time ago? In what year or season?" "What length of time?" (minutes, hours, days, years)
Clothing/ Accessories "What is he wearing or carrying?" Feelings/Reaction Angry, scared, joyful, confused "How does he look like he feels?" (angry, sad, happy, etc.)	Position Standing, sitting, leaning, forward First, second Left, right, front, back North, South, East, West "Is he standing? Leaning forward?" (right, left, front, back, north, south)	Relation Above, below, near, far Friend, parent, stranger Brother, sister, aunt Teacher, husband, wife Grandparent, uncle, cousin, boss "Is this your friend?" "How close or far?" "Is this a family member?"

Handout for additional games: <https://equippingminds.com/wp-content/uploads/2019/05/2021-Equipping-Minds-To-Reach-Their-Full-Potential-1-2.pdf>

Order of Animals Cheat Sheet

Circle around the



Web around the



Box around the



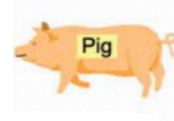
Three eggs under the



X on the



Bacon on the



Triangle around the



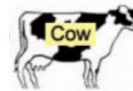
Tree in front of the



Line under the



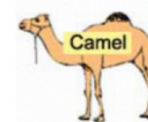
Bucket under the



Line above the



Hump on the



Smiley face on the



Lily pad under the



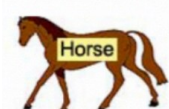
Nest under the



Stinger on the



Unicorn on the



Tall grass on the



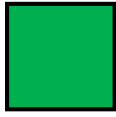
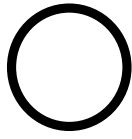




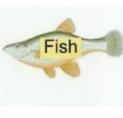

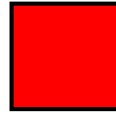
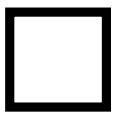
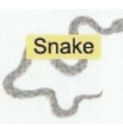

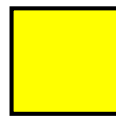

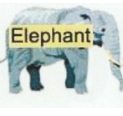



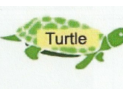



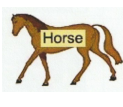



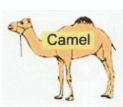





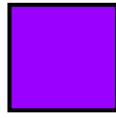

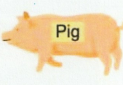

Claws on the



Waves on the



Equipping Minds Cheat Sheet

1					a	A	January
2					e	B	February
3					i	C	March
4					o	D	April
5					u	E	May
6						F	June
7						G	July
8						H	August
9						I	Sept.

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Take My Hand and Run with Me!

When people look at me,
A great student they see,
Spoken well of by the faculty,
Who constantly excels academically,
Who will go into vocational ministry,
This path has been far from easy,
For me, nothing ever came naturally,
Since a child I worked more rigorously,
Than all my fellow classmates,
Always falling behind in my classes,
No matter how much effort,
It never looked well on my report,
Despite my failures, I pressed forward,
Discouragement was constant, yet I endured,
The hope and love my parents showed,
And the Lord's hand of providence,
Brought me from shame and disgrace,
To a place filled with faith and grace,
Fellow student, have hope and rejoice,
For you also can be set free,
From all these struggles and miseries,
For nineteen years it haunted me,
But now I can run with ease,
See and learn from me, oh please!
I wish to see you at peace,
So take my hand during this race,
We will run a steady pace,
Confident with hope and success,
Until we unlock your gifts.

*By Clayton Brown
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