Library Programming and the Developing Brain

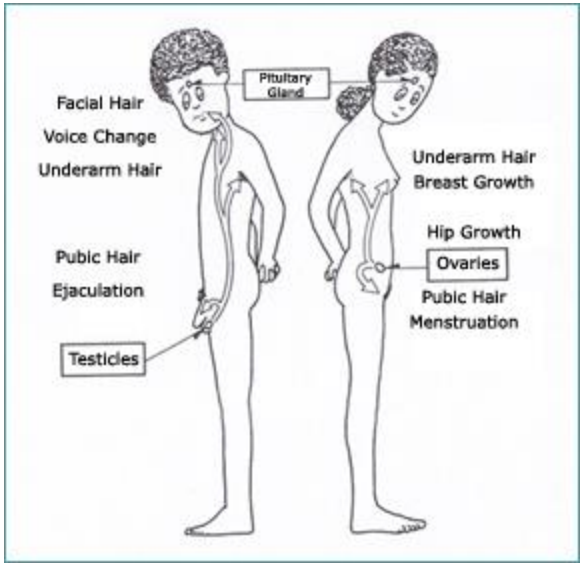
School Age and Beyond

MANY THEORIES: ONE CHILD

	Freud's Psychoanalytic Theory *Psychosexual Development*	Erikson's Theory of *Psychosocial Development*	Piaget's Theory of *Cognitive Development*	Kohlberg's Theory of *Moral Development*
Infants (birth to 1 year)	***Oral Stage*** • Child explores the world by using mouth, especially the tongue • Infants are interested in oral stimulation • Baby finds pleasure in the mouth	***Trust vs. Mistrust*** • Psychosocial Virtue: Hope • Fear: strangers, anxiety, loud noises, falls, sudden movements in the environment • Play: Solitary Reflect • Learning confidence or learning to love	***Sensorimotor Stage*** ***Neonatal Reflex (1 mo.)*** • Stimuli are assimilated into beginning mental images. Behavior entirely reflexive ***Primary Circular Reaction (1-4 mos.)*** • Hand-mouth & ear-eye coordination develops. • Infant spends time looking at objects • Toy: rattle or tape of parent's voice ***Secondary Circular Reaction (4-8 mos.)*** • Infant learns to initiate, recognize, and repeat pleasurable experiences • Infant anticipates familiar events • Toy: peek-a-boo ***Coordination of Secondary Reactions (8-12 mos.)*** • Infant can plan activities to attain specific goals. • Discovers a sense of identity, that his activities are separate from the activities of others. • Toy: nesting toys; colored boxes	
Toddler (1-3 y/o)	***Anal Stage*** • Child learns to control urination and defecation • Toilet training • It is a part of the toddler's self-discovery, a way of exerting independence	***Autonmy vs. Shame*** • Psychosocial Theme: "hold on or let go" • Child learns to be independent and make decisions for self • Favorite word: "I", "no"	***Inventions of new means through mental combinations (1-2 y/o)*** • Transitional phase • Uses memory and imitation to act • Can solve basic problems, foresee maneuvers that will succeed or fail • Toy: Blocks, colored plastic rings ***Preoperational Thought (2-7 y/o)*** • Thought becomes more symbolic • Can arrive at answers mentally • Thinking is basically concrete and critical • Child is ***egocentric*** • Displays static thinking • .Concept of time is now, and concept of distance is only as far as he/she can see • No awareness of reversibility (for every action there is an opposite action) ***Concrete Operational Thought (7-12 y/o)*** • Systematic reasoning • Uses memory to learn broad concepts • Classifications involve sorting objects accdg to attributes • Child is aware of reversibility • Understands conservation, sees constancy despite of transformation ***Formal Operational Thought (12 yr)*** • Can solve hypothetical problems with scientific reasoning • Understands causality • Can deal with the past, present & future • Adult or mature thought	***Preconventional (Level I)*** ***Stage 1: (2-3y/o)*** • Punishment / obedience orientation • Heteronomous morality • Child does right because a parent tells him or her to and to avoid punishment ***Stage 2: (4-7 y/o)*** • Individualism • Instrumental purpose and exchange • Carries out actions to satisfy own needs rather than society's • Will do something for that person if that person does something for the child ***Conventional (Level II)*** ***Stage 3: (7-10 y/o)*** • Orientation to interpersonal relations of mutuality • Child follows rules because of a need to be a "good" person in own eyes and eyes of others ***Stage 4: (10-12 y/o)*** • Child finds following rules and authority • Child finds following rules satisfying • Follows rules of authority figures and parents in an effort to keep the "system" working
Preschooler (3-6 y/o)	***Phallic Stage*** • The genitals are the pleasure of the child • Oedipus and Electra Complex • Child learns identity through awareness of genital area • Masturbation is common during this phase • Children may also show exhibitionism	***Initiative vs. Guilt*** • Ability to try new things • Intensive activity and consuming fantasies • Interjects parent's social consciousness • Child learns how to do things and that doing things is desirable • Knows right or wrong • Bogus playmates/imaginary • Fears: dark, being left alone, large animals, ghosts, body mutilation, pain & objects		
School-Age (6-12 y/o)	***Latent Stage / Latency Period*** • All the sexual desires arch • Child's personality development appears to be nonactive or dormant	***Industry vs. Inferiority*** • Makes things w/ others • Strives to achieve success • Child learns how to do things well		

Physical development

Puberty


Pituitary Gland
Facial Hair
Voice Change
Underarm Hair
Pubic Hair
Ejaculation
Testicles
Underarm Hair
Breast Growth
Hip Growth
Ovaries
Pubic Hair
Menstruation


Age 7
Age 19
© Menstrupedia

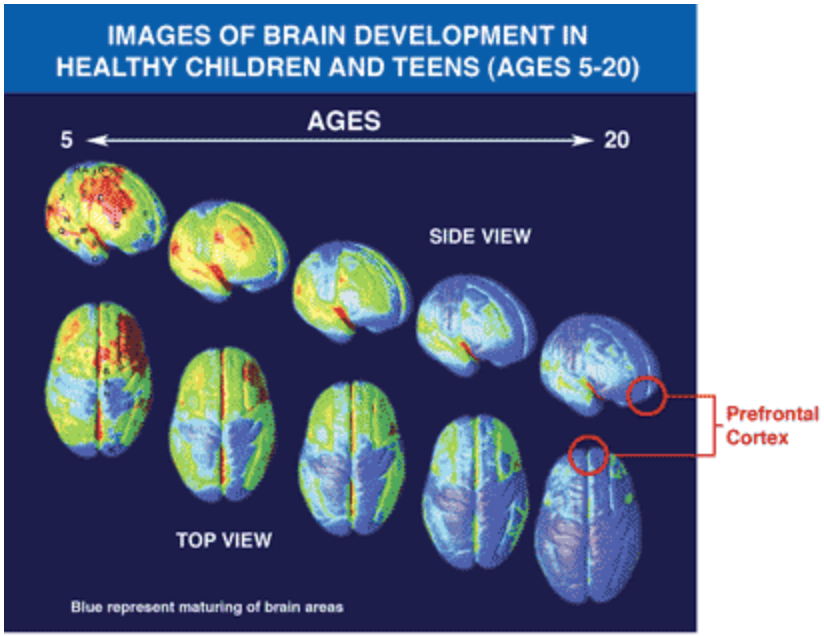
Table

The 5 stages of puberty

The Tanner system is one of the most common staging systems used to describe the normal maturational events of puberty. Separated into 5 categories of pubertal status, Tanner systems use different scales for males and females. A typical scale in 3 categories, one for boys, one for girls, and one that combines both, is shown.

	EXTERNAL GENITALIA (boys)	BREAST DEVELOPMENT (girls)	PUBIC HAIR DEVELOPMENT (both)
Stage I (prepubertal)	*Prepubertal*	*Prepubertal*	*Prepubertal (can sometimes see vellus hair similar to that on abdominal wall)*
Stage II (beginning pubertal)	*Scrotum enlargement, testes enlargement, scrotum changes in texture and color (reddens)*	*Elevation of breast and papilla; enlargement of areola (breast bud stage)*	*Sparse growth of long, slightly pigmented hair, straight or curled at base of penis or along labia*
Stage III (midpubertal)	*Enlargement of penis (length enlarges before thickness); testes continue to grow*	*Further enlargement of breast and areola (no separation of contour)*	*Hair gets darker, coarser, more curled; spreads sparsely from pubic junction*
Stage IV (advanced pubertal)	*Development of glans; penis size continues to increase; testes and scrotum continue enlargement, scrotum skin darkens*	*Areola and papilla form secondary mound above normal level of breast*	*Adult hair present, covering smaller area than eventual adult pattern, no spread to medial thigh surfaces*
Stage V (postpubertal)	*Adult genitalia size and morphology*	*Maturing; papilla projects, but is related to areola recession*	*Adult pattern emerges and stabilizes*

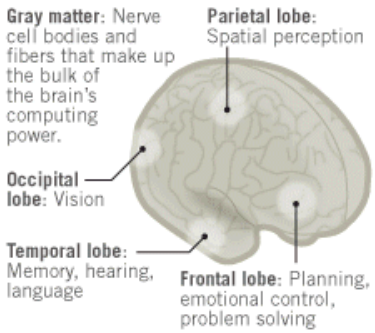
After transit through this stage, the incidence of depressive disorders between females and males begins to diverge (1:1 changes to 2:1).



Source: Copyright PNAS ;101(21):8174-9. 2004

Growing a Grown-up Brain

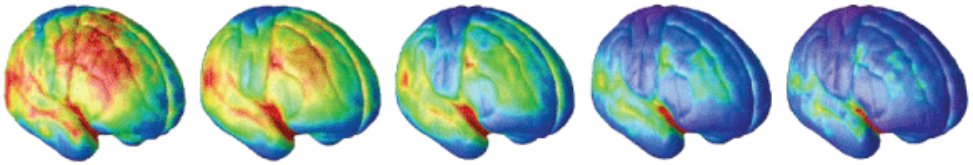
Scientists have long thought that the human brain was formed in early childhood. But by scanning children's brains with an MRI year after year, they discovered that the brain undergoes radical changes in adolescence. Excess gray matter is pruned out, making brain connections more specialized and efficient. The parts of the brain that control physical movement, vision, and the senses mature first, while the regions in the front that control higher thinking don't finish the pruning process until the early 20s.



Gray matter density

Gray matter becomes less dense as the brain matures.

More dense — Less dense



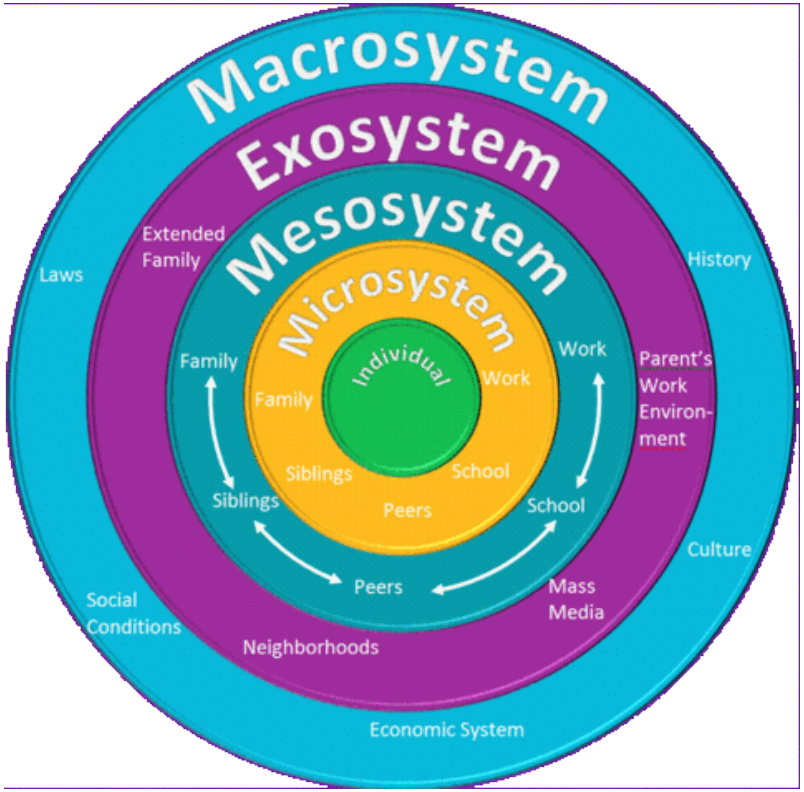
Age: 5 — Adolescence — 20

Source: "Dynamic mapping of human cortical development during childhood through early adulthood," Nitin Gogtay et al., *Proceedings of the National Academy of Sciences*, May 25, 2004; California Institute of Technology

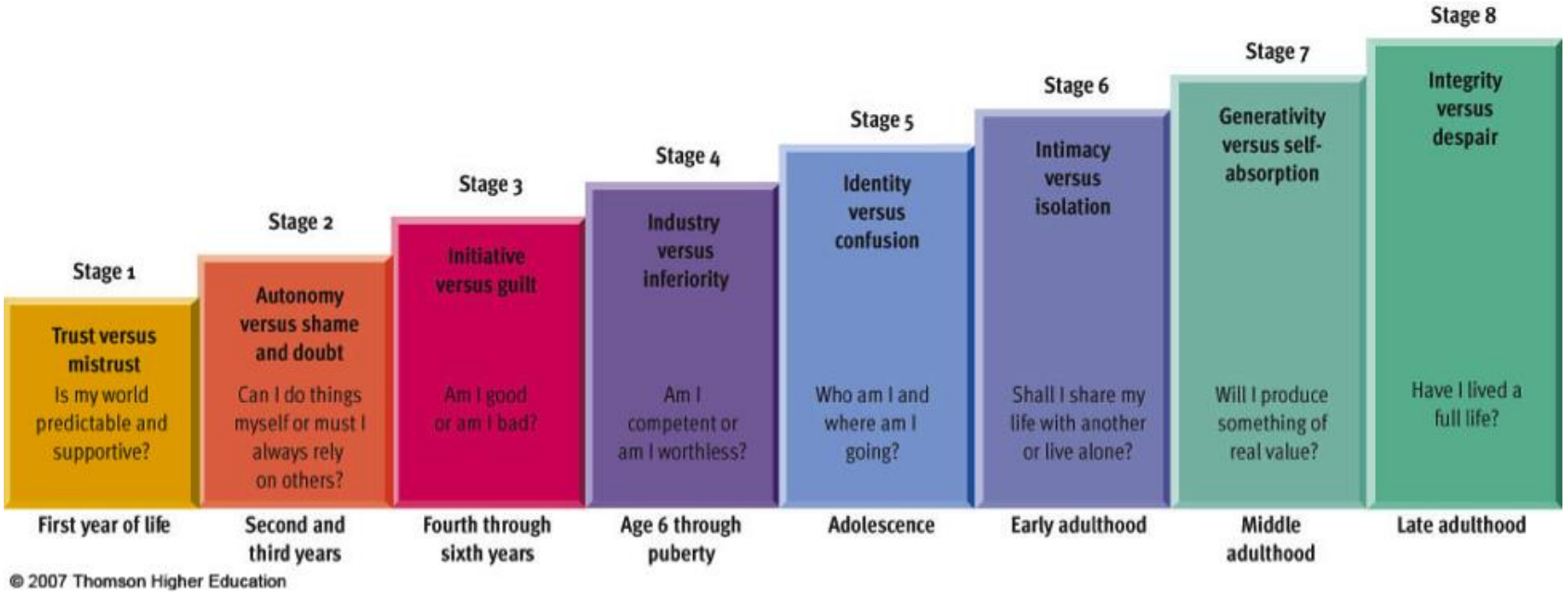
How do physical changes affect how children use the library?

Social & Emotional Development

Ecological Systems Theory Bronfenbrenner



Erikson's theory



KOHLBERG

Kolberg's Theory

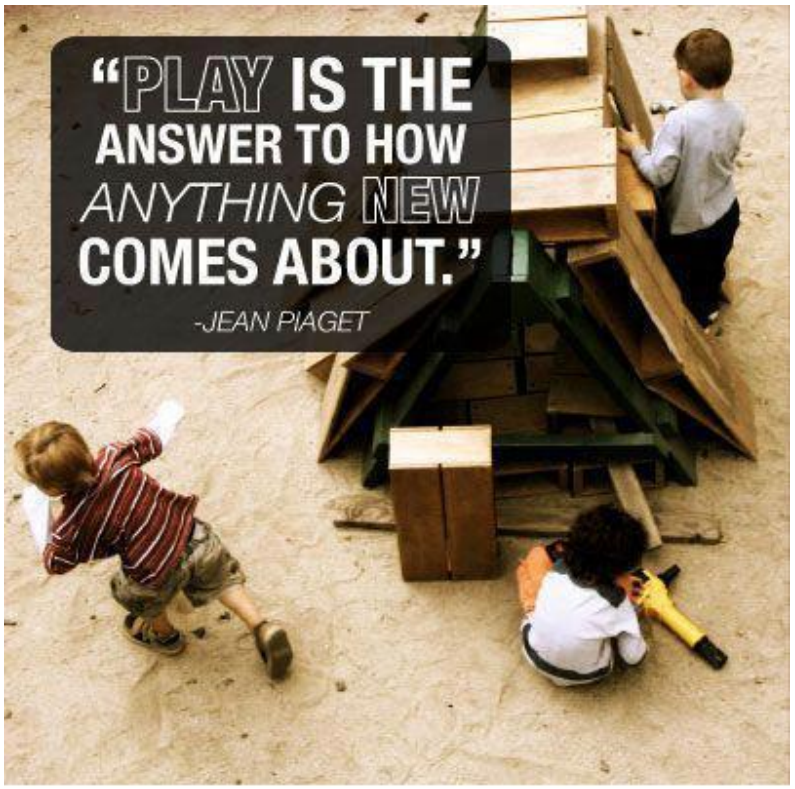
Level/Stage	Age Range	Description
I: Obedience/Punishment	Infancy	No difference between doing the right thing and avoiding punishment
I: Self-Interest	Pre-school	Interest shifts to rewards rather than punishment – effort is made to secure greatest benefit for oneself
II: Conformity and Interpersonal Accord	School-age	The "good boy/girl" level. Effort is made to secure approval and maintain friendly relations with others
II: Authority and Social Order	School-age	Orientation toward fixed rules. The purpose of morality is maintaining the social order. Interpersonal accord is expanded to include the entire society
III: Social Contract	Teens	Mutual benefit, reciprocity. Morally right and legally right are not always the same. Utilitarian rules that make life better for everyone
III: Universal Principles	Adulthood	Morality is based on principles that transcend mutual benefit.

The Psychology Notes Headquarter - http://www.PsychologyNotesHQ.com

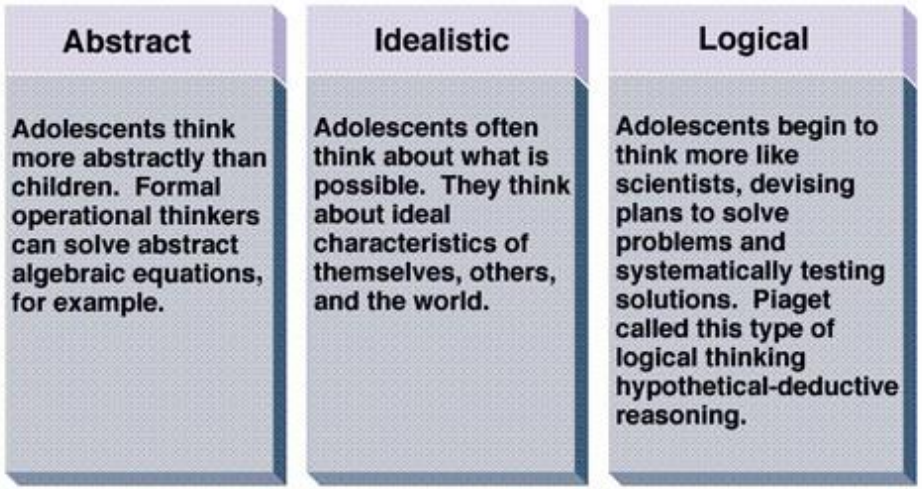
How do Social & Emotional changes affect how children use the library?

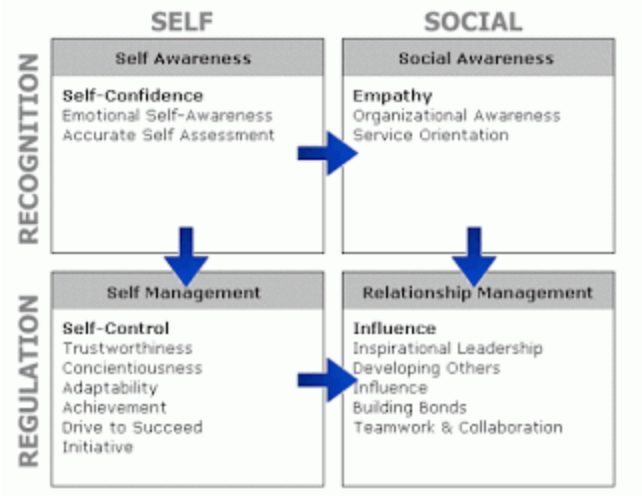
Cognitive Development

Abstract Thought


"PLAY IS THE ANSWER TO HOW ANYTHING NEW COMES ABOUT."
-JEAN PIAGET

Characteristics of Formal Operational Thought



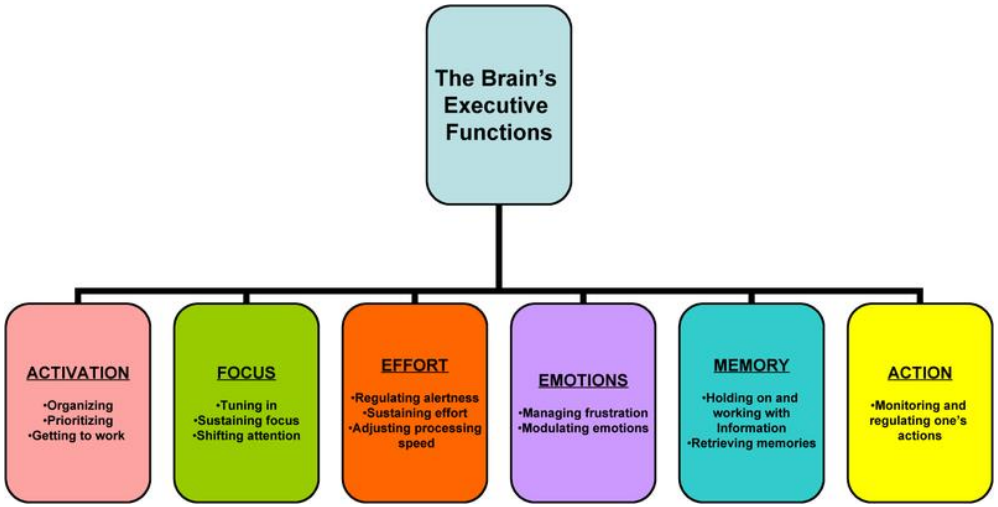

SELF
SOCIAL
RECOGNITION
REGULATION
Self Awareness
Self-Confidence
Emotional Self-Awareness
Accurate Self Assessment
Social Awareness
Empathy
Organizational Awareness
Service Orientation
Self Management
Self-Control
Trustworthiness
Concientiousness
Adaptability
Achievement
Drive to Succeed
Initiative
Relationship Management
Influence
Inspirational Leadership
Developing Others
Influence
Building Bonds
Teamwork & Collaboration

Play Theory

https://www.youtube.com/watch?v=RjwUn-aA0VY

How do cognitive changes affect how children use the library?

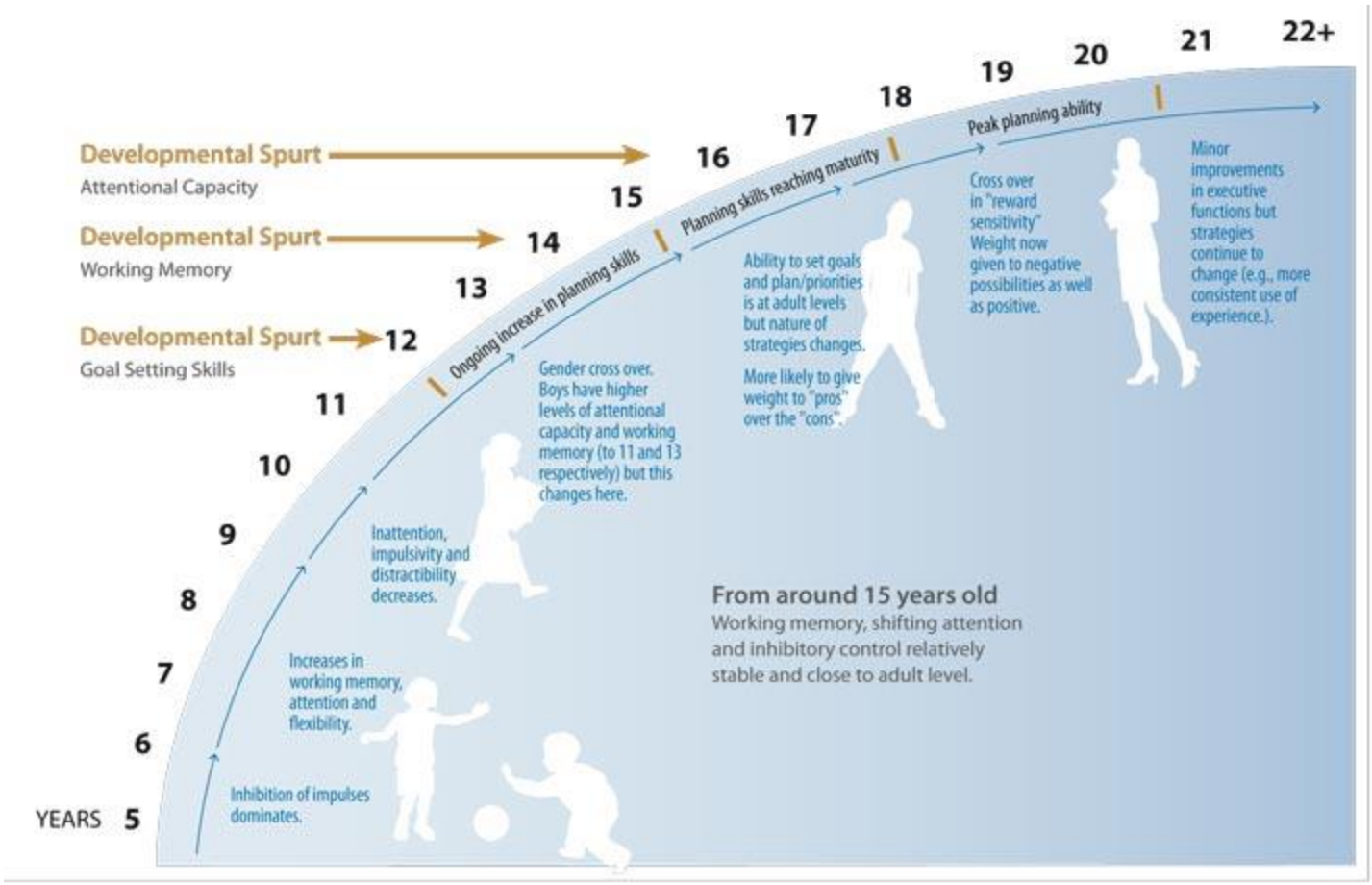
Executive Function

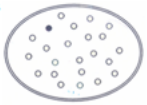
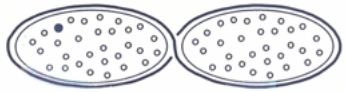

The Brain's Executive Functions
ACTIVATION
•Organizing
•Prioritizing
•Getting to work
FOCUS
•Tuning in
•Sustaining focus
•Shifting attention
EFFORT
•Regulating alertness
•Sustaining effort
•Adjusting processing speed
EMOTIONS
•Managing frustration
•Modulating emotions
MEMORY
•Holding on and working with Information
•Retrieving memories
ACTION
•Monitoring and regulating one's actions

Essential Life Skills

- FOCUS AND SELF CONTROL involves many executive functions of the brain: *paying attention, remembering the rules* and *inhibiting one's initial response in order to achieve a larger goal.*
- PERSPECTIVE TAKING requires *inhibitory control* (inhibiting our own thoughts and feeling to consider the perspectives of others); *cognitive flexibility* to see a situation in different ways; and *reflection* or the ability to consider someone else's thinking alongside our own.
- COMMUNICATING well involves *reflecting* upon the goal of what we want to communicate and *inhibiting* our point of view so we can understand the point of view of others,
- MAKING CONNECTIONS begins with sorting and categorizing, understanding that one thing can stand for or represent another. Making multiple connections is a skill that becomes evident during the later preschool years and calls on *working memory, inhibitory control* and *cognitive flexibility,*
- CRITICAL THINKING is the ongoing search for valid and reliable knowledge to guide beliefs, decisions and actions.
- TAKING ON CHALLENGES
- SELF-DIRECTED, ENGAGED LEARNING

From *Mind in the Making* by Ellen Galinsky, HarperCollins, 2010.


Developmental Spurt
Attentional Capacity
Developmental Spurt
Working Memory
Developmental Spurt
Goal Setting Skills
YEARS 5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22+
Inhibition of impulses dominates.
Increases in working memory, attention and flexibility.
Inattention, impulsivity and distractibility decreases.
Ongoing increase in planning skills
Gender cross over. Boys have higher levels of attentional capacity and working memory (to 11 and 13 respectively) but this changes here.
Planning skills reaching maturity
Ability to set goals and plan/priorities is at adult levels but nature of strategies changes.
More likely to give weight to "pros" over the "cons".
Peak planning ability
Cross over in "reward sensitivity" Weight now given to negative possibilities as well as positive.
Minor improvements in executive functions but strategies continue to change (e.g., more consistent use of experience.).
From around 15 years old
Working memory, shifting attention and inhibitory control relatively stable and close to adult level.

Developmental Stage/ Order of Mind (typical ages)	**What can be seen as *object*** (the content of one's knowing)	**What one is *subject* to** (the structure of one's knowing)	**Underlying Structure of Meaning-Making**
1st Order: Impulsive Mind (~2-6 years-old)	one's reflexes	one's impulses, perceptions	Single Point
2nd Order: Instrumental Mind (~6 years-old through adolescence)	one's impulses, perceptions	one's needs, interests, desires	Categories 
3rd Order: Socialized Mind (post-adolescence)	one's needs, interests, desires	interpersonal relationships, mutuality	Across Categories 
4th Order: Self-Authoring Mind (variable, if achieved)	interpersonal relationships, mutuality	self-authorship, identity, ideology	Systemic 
5th Order: Self-Transforming Mind (typically > ~40, if achieved)	self-authorship, identity, ideology	the dialectic between ideologies	System of Systems 

Adapted from Kegan, Robert. *In Over Our Heads: the Mental Demands of Modern Life.* Cambridge: Harvard University Press, 1994. pp. 314-315.

World Peace and other 4TH grade Achievements

- https://www.youtube.com/watch?v=lCq8V2EhYs0

How do executive function changes affect how children use the library?

Apply what you learned!!

Additional Resources

- http://www.nlm.nih.gov/medlineplus/ency/article/002017.htm
- http://www.pbs.org/parents/talkingwithkids/agebyage_5.html
- http://www.stanfordchildrens.org/en/topic/default?id=the-growing-child-school-age-6-to-12-years-90-P02278