

Choosing Content for Children: Preschool Language, Literacy, Mathematics, Science*

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Goal & Agenda

Goal: To work together to serve children well
 Focus on children at least 3 & up to 5 years old (**not** yet in Kindergarten)
 Provide frameworks & information about literacy, mathematics, science & language
 Motivate and facilitate ideas & questions

Agenda: See board

Who we are and what we did: The information base

- Search for & analyze basic & applied research: identify & analyze work reported in yearbooks, handbooks, overviews, reviews, meta-analyses.
- Verify & augment with database searches: ERIC, PsycInfo, Campbell Collaborative.
- Search for & analyze standards & other policy from government & non-government organizations
- Search for & analyze materials & curricula
- Participate in preschools (volunteer teacher aide & resource specialist)
- To appear, Summer, 2005. Possible Title: *WHAT Matters for Children and Teachers: Language, Literacy, Mathematics and Science Content for Preschools*. For details, contact authors: Peg.Griffin@att.net Catherine.King@elon.edu. Or, check in August at www.shankerinstitute.org/education.html. See within each section for sample references relevant to growth in each domain: mathematics pp. 4-5; literacy, pp. 11-12; science, pp. 16; language, pp. 19-20

Who are you: Even Start's Four Tasks. Who here does what?

- Blend agencies
- Early childhood education
- Family/Adult literacy/education
- Parenting education

Besides these content domains: Keep ...

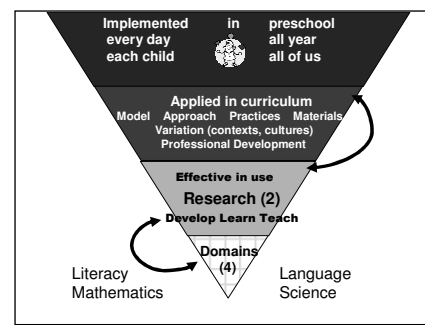
- Focus on child's development
 - Social, Emotional & Behavioral: especially self regulation, with & through family
 - Sensory-Motor & other aspects of Physical & Health development.
- Other content: art, music, social science
- Centers, themes, projects
- Effective instructional approaches, daily routines, & room arrangement

Research Base

- Effective in use: implementation fidelity, valid & reliable instruments, study design and analysis that support inferences of cause and contextual appropriateness, longitudinal effects
- Develop, Learn, Teach (Basic): theoretically sound for the domain, methods, design, instruments, analysis appropriate for question
- Content specified or research in trouble

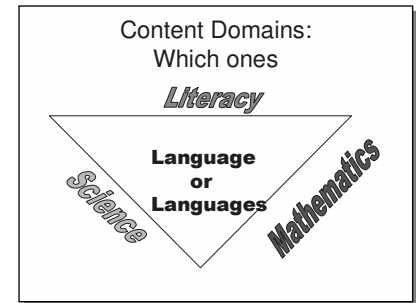
Research findings not in doubt

- Quality preschools work; Effects well into adulthood
- New view of young children:
 - More competent & active in own development; Able & eager to learn with adults/peers;
 - Less on general processes and stages; More domain specific knowledge & skills; Cultural,



situational & task variations

Content Domains: Which ones: Language & literacy in all; mathematics and science grist for language and literacy mills



Language and culture rich preschools

- English as an Additional Language Not “subtractive” bilingualism
- Emergent literacy with different scripts & COP
- Cultural differences in home & society; Patterns of action & interpretation
 - What it takes to learn, what it means to be a learner, what is worthwhile learning
- If gap, refine & expand help, do **not** reduce the tasks and topics

Content Domains: What’s in them

Ways to promote growth: Teaching and chances to learn

- Incidental: In play & daily routines; Across domains (literacy in mathematics)
- Practice: Like incidental; But knowledge and skill met before; Now making it easier, interesting, useful, valuable
- Intentional: Lessons and games; Large or small groups or 1-1; Short time or distributed over short bursts of time

Incidental learning & teaching

- As a part of daily living, in preschool and out, problems are found and solutions arrived at
 - Children witness situations
 - Children participate in situations
 - Children learn from and in situations
- Many *incidents* are relevant to learning language, literacy, science, and mathematics
- Teachers provoke and capitalize on *incidents*
- Teachers scaffold child’s participation and learning to turn tasks (including initiation) over to the child

Practice

- Children spend more time learning than any school could arrange
- Children
 - Consolidate knowledge & skills
 - Develop disposition to apply learning
 - Gain mastery: speed, accuracy, depth of processing
 - Transfer & generalize what they learn
- Teachers
 - arrange and enhance practice
 - scaffold child’s participation, turn task over to child, including its initiation

Intentional teaching & learning

- Systematic content-defined goals
- Dedicated time (short or connected bursts)
- Specific sequence of activities
 - Planned
 - Carried out
 - Monitor & adjust for child learning
 - Evaluate & adjust teaching

Mathematics in preschool

Children & mathematics books

This list has been added to and subtracted from in conversations with teachers and parents of young children. Some items are emergent reader books, others are more of the "please, read it to me" type, and some are inspirations for teachers' oral stories. There is some fiction that can be read without attention to mathematics but it can be more fun with choral counting and mathematical predictions, questions, answers, and opinions.

Counting books are most numerous; the most interesting ones count down as well as up, do skip counting (by 2's or 10's), and show groupings to start talk about factors and number facts. Some books bring up number words in other languages (Hobzek in 12 languages, Morales for Spanish and English, and Swahili by Feelings).

Some books have lush photographs or other art work. Some are about interesting places (Sheather and Toft about the Great Barrier Reef). Even division is fun when the story is about problems that keep reducing the fictional characters by half (Dodd and Mitchell). Tales told while tangram shapes are changed are featured, too (Maccarone, Marsh, and Tompert). One new favorite by Tang, published in 2004 by Scholastic is a set of rhymed fables that provide a chance to notice factors and number facts as well as some rare words that are fun to learn to say and use.

So here's a list to start talking over with people you talk mathematics for preschoolers with

- | | |
|--|---|
| Abel, Simone <i>Shapely Sheep</i> | Goldstone, B. & H. Cahoon <i>Ten Friends</i> |
| Aker, Suzanne <i>What Comes in 2s, 3s, & 4s?</i> | Grossman, Virginia. <i>Ten Little Rabbits</i> |
| Albee, Sarah <i>The Oreo Cookie Counting Book</i> | Hall, Z. <i>It's Pumpkin Time!</i> |
| Allen, P. <i>Who Sank the Boat?</i> | Hamm, D. J. <i>How Many Feet in the Bed?</i> |
| Anno, Mitsumasa (and Masaichiro Anno) <i>Anno's Counting Book; Anno's Counting House; Anno's Math Games I, II, and III</i> | Hoban, R. <i>Ten What? A Mystery Counting Book</i> |
| Arnold, Ted <i>Five Ugly Monsters</i> | Hoban, Tana <i>1, 2, 3; Count and See; Let's Count; All About Where; 26 Letters and 99 Cents; Cubes, Cones, Cylinders, & Spheres; Shapes, Shapes, Shapes; Exactly the Opposite.</i> |
| Asbjornsen, P. C. <i>The Three Billy Goats Gruff.</i> | Hobzek, M. <i>We Came A-Marching...1, 2, 3</i> |
| Axelrod, Amy <i>Pigs on a Blanket</i> | Hutchins, P. <i>Rosie's Walk; The Doorbell Rang</i> |
| Aylesworth, J. <i>The Completed Hickory Dickory Dock</i> | Jackson, Woody <i>Counting Cows</i> |
| Bang, Molly <i>Ten, Nine, Eight</i> | Johnson, S. T. <i>City by Numbers</i> |
| Benton, L. <i>I See Patterns</i> (ill. J. Peck) | Keats, Ezra Jack. <i>Over in the Meadow</i> |
| Berenstain, S. & J. <i>The Berenstain Bears Catch the Bus</i> | King, A. & T. Kenyon <i>Making Fractions: Math for Fun.</i> |
| Brenner, B. <i>Mr. Tall and Mr. Small</i> | Lindbergh, Reeve. <i>The Midnight Farm.</i> |
| Burton, M. R. <i>Tail Toes Eyes Ears Nose</i> | Lionni, Leo. <i>Inch by Inch</i> |
| Carle, Eric <i>My Very First Book of Numbers; 1, 2, 3 to the Zoo; The Grouchy Lady Bug; The Very Hungry Caterpillar; Today Is Monday</i> | Llewellyn, Claire <i>My First Book of Time,</i> |
| Carter, David A. <i>How Many Bugs in a Box?</i> | Long, Lynette. <i>Domino Addition</i> |
| Catalanotto, P. <i>Daisy 1, 2, 3</i> | Maestro, B. <i>The Story of Clocks & Calendars</i> |
| Christelow, E. <i>Five Little Monkeys Sitting in a Tree</i> | Maccarone, G. <i>Three Pigs, One Wolf and Seven Magic Shapes</i> |
| Crews, Donald <i>Ten Black Dots</i> | Manning, Maurie J. <i>The Aunts Go Marching</i> |
| Crowther, Robert. <i>The Most Amazing Hide-and-Seek Counting Book.</i> | Marsh, V. (some with tangrams) <i>Treasury Of Trickster Tales; True Tales Of Heroes And Heroines</i> |
| Dodds, D. A. & T. Mitchell <i>The Great Divide</i> | McGrath, B. B. <i>The M & M's Counting Book</i> |
| Dotlich, R. K. & M. Ferrari <i>What Is Square?</i> | McMillan, B. <i>Fire Engine Shapes</i> |
| Duke, Kate <i>Twenty Is Too Many</i> | Merriam, Eve <i>12 Ways to Get to 11</i> |
| Ehlert, Lois <i>Fish Eyes: A Book You Can Count On</i> | Michelson, R. & L. Baskin <i>Ten Times Better</i> |
| Emberley, Ed <i>The Wing on a Flea: A Book About Shapes</i> | Montague-Smith, A. & M. Stanley <i>First Shape Book</i> |
| Feelings, Muriel <i>Moja Means One: Swahili Counting Book</i> | Morales, Y. <i>Just a Minute: A Trickster Tale and Counting Book</i> |
| Galdone, Paul <i>Goldilocks and the Three Bears</i> | Murphy, Jill <i>Five Minutes' Peace</i> |
| Giganti, Paul <i>How Many Snails; Each Orange Had Eight Slices: A Counting Book</i> (ill. D. Crews) | Murphy, C. <i>Bow Wow: A Pop-Up Book of Shapes</i> |
| Glass, J. <i>The Fly on the Ceiling: A Math Myth</i> | Myller, R. <i>How Big Is a Foot?</i> |

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Neuschwander, C. & W. Geehan *Sir Cumference and the Knights of the Round Table*
 Owen, Annie. *Annie's One to Ten*
 Pallotta, J. *The Hershey's Kisses Addition Book*
 Pallotta & R. Bolster *One Hundred Ways To Get to 100*
 Pallotta & D. Biedrzycki, *Underwater Counting: Even Numbers.*
 Pallotta, Biedrzycki & Bolster *Icky Bug Numbers*
 Peek, Merle *Roll Over! A Counting Song*
 Pinczes, E. J. & R. Eno *Inchworm & A Half; My Full Moon is Square*
 San Souci, R. D. & D. Kennedy *Six Foolish Fishermen.*
 Schwartz, D. M. & J. Warhola *If You Hopped Like A Frog*
 Schwartz & S. Kellogg *Millions to Measure.*

Sendak, Maurice *One Was Johnny: A Counting Book*
 Sheather, A. & K. M. Toft *One Less Fish*
 Sis, Peter *Fire Truck*
 Skwarek, S. *The Father Who Had Ten Children*
 Slater, T. *Just a Minute*
 Steig, W. *Sylvester and the Magic Pebble*
 St. Pierce, S. *The Count Counts Scary Things*
 Swinburne, S. *What's a Pair? What's a Dozen?; The Sesame Street Book of Shapes*
 Tang, G. (Cahoon, H. Illustrator) *Math Fables.*
 Tompert, A. *Grandfather Tang's Story* Turner, P. & W. Turner *Among the Odds and Evens: A Tale of Adventure;*
 Walton, R. *One More Bunny*
 Williams, R. L. *The Skip Count Song*
 Wise, William. *Ten Sly Piranhas*
 Zeifert, H. *A Dozen Dozen*

Terms

Mathematics: the science of numbers and their operations, interrelations, combinations, generalizations, and abstractions and of space configurations and their structure, measurement, transformations, and generalizations. – Merriam Webster

Mathematization: abstracting & representing reality with mathematical concepts & objects.

Number is NOT a perceptual property of objects or events.

Pair of cups

Couple of fish

Weekend days with no schools

Boop beep (sequence of tones)

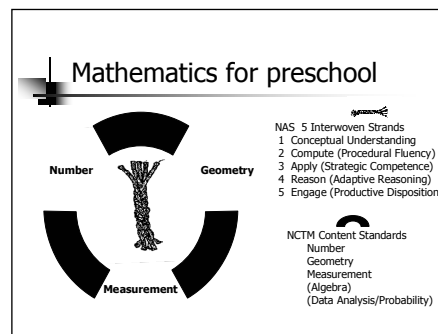
- Not like colors or tactile qualities (fuzzy)
- Noticing all those are 2 is an example of mathematization. Big accomplishment!
- To know a number is to engage with the concept of quantity and be precise about it.

Geometry beyond direct perception, too

- A door, a window, a picture frame, and a drawn rectangle are the same shape but different sizes
materials
orientation and
ratios of length to width
- Noticing shape is also a mathematization of experience. A big accomplishment!

Experiences are mathematized with actions

- counting and computing quantities
- measuring
- adjusting and transforming shapes
- reasoning with quantities and shapes



National Council of Teachers of Mathematics. *Principles and Standards for School Mathematics* (pre-K- Grade 2 band)

At the core of mathematics in the early years are the Number and Geometry Standards. Numbers and their relationships, operations, place value, and attributes of shapes are examples of important ideas from these Standards. Each of the other mathematical Content Standards contributes to, and is learned in conjunction with, the Number and Geometry Standards.” [p. 76]

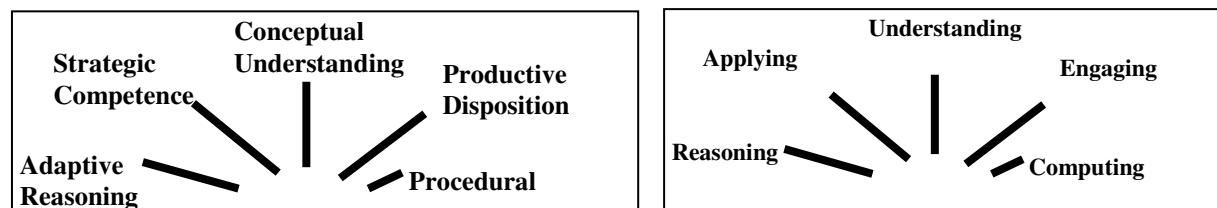
Readers’ Theatre Scene Mathematics

- Children: - Counting & dividing; - Reason, adapt & apply - Understand & practice fluency - Engaged & positively disposed	- Teacher: - Set task and solution - Engage - Scaffold - Differentiate
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Mathematical Proficiency: Interwoven strands develop together (THE ROPE from NAS)

Adapted from *Adding it up: Helping Children Learn Mathematics* 2001:5

Problem solving



Interwoven strands develop together: No “math wars”

No understand VS do calculations
 No principles VS skill mastery
 No concepts VS fact fluency
 No higher order thinking VS basic skills
 No strategies VS algorithms
 No computation VS problem solving
 No estimation VS precision
 YES -- ALL FIVE STRANDS interwoven

The five strands

- *conceptual understanding* – comprehend concepts, operations, & relations of quantity and shape
- *procedural fluency* – flexible skill, carry out procedures accurately, efficiently, appropriately (count, add, divide, measure; compose, transform & decompose shapes)
- *strategic competence* – formulate, represent, & solve mathematical problems by applying concepts and procedures
- *adaptive reasoning* – logical thought, reflection, explanation, and justification
- *productive disposition* – engagement, motivation, habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy

Topics for the 5 strands of Proficiency in Preschool (THE RADIAL from NCTM)

Number Geometry Measure

Number

- Number sense Counting Operations (calculation, computation)

Enter with:	Preschool builds:
Say numbers 1-10	Say numbers at least to 30; read and write up to 20
Identify number in small sets (3-4 subitize)	Recognize relations of numbers close on the number line & relate to landmark numbers
Count up to 4 items	Count 10 items (20 with effort/ help) in accord with 5 counting principles (including cardinality)
Compare small sets of objects (same, more, or less)	Count to make & verify set comparisons up to 10 items
Add and subtract with small sets of objects	During ordinary day & in games & lessons: Solve add & subtract problems (up to 10) using strategies, number sense, some number facts Verify solutions & explain results (proof)

Number sense: a synthesis of the child's background knowledge of quantity and numbers.

Number sense is ...

having different ways to think about & represent a number, depending on context and purpose.

- 3 can be 1, 1 and 1
- 3 can be 1 and 2
- 3 can be 5 missing 2 (landmark)
- 3 can be doubled to 6
- 3 is as close to 5 as it is to 1
- 3 is far from 10 (landmark)
- 3 is as near to 2 as it is to 4
- if you start at 1 you go up to 3
- if you start at 5 you go down to 3

Number sense specifics

- Most 4 year olds
 - strong, flexible number sense for single digits
 - more slow, less accurate, less sure if numbers large & close together (15, 16)
- Good number sense
 - lets child notice, check and fix when result of operation is much too big or small
 - helps child use supports (fingers, blocks, number lines) to quickly "see" how much bigger one number is than another

Number sense activities on large floor or wall number lines

- Move along a number line to pose problems, explain them, solve and practice them and to support & sharpen memory. Make group games & tasks. A child is the moving piece, one side sets goal, other side directs moves.
- A number line allows "counting on" from numbers other than 1, and saying the sequence backwards. Counting on and going backwards enrich number sense, help with adding or subtracting.
- A number line can scaffold & prove counting, adding, subtracting.

Number sense & numerals

- Children from high & low SES households perform about the same on number sense activities, unless written Arabic numerals are used without objects; then children from the higher SES households do better.
- When representing quantities observed, counted or calculated, scaffold the recognition, production, and fluent use of Arabic numerals by using them with toy objects, chips or other manipulatives, drawings, and hash marks.

Counting: pairing some set of items with number representations

- Regardless of position, arrangement, speed, or other variations in the set of items, the **count** stays the same until the quantity of items changes.
- Children who know number words, even know how to say them in the proper sequence, may not have them in their “count list” – the list of numbers that can really truly function for counting items or events.

Counting: 5 principles

1. one-to-one correspondence between item & number
2. use a stable order (sequence) for tags – each successive number word from the sequence indicates one more item in the set
3. use any order (sequence) for the items – different item order doesn’t change the result
4. cardinality: last number in count sequence is the cardinal value – tells how many.
5. abstract: it doesn’t matter what is collected into a set for a count. You can mix apples & oranges!

Counting use

Own sake

Games and lessons

Decisions or problems (add, subtract, divide)

Skip counting

- counting by 2’s or 10’s and even by 5’s.
- for some, may be just a chant unrelated to number line or counting items
- for others, skip counting gets meaning and utility in table games, in the playground or on TV. Celtics up by 2!
- Skip counting can enrich the mental number line and is thought to be a help for later school multiplication and division.

Operations or calculations

By the time they are in preschool, children’s counting is ready to work with well-used concepts of more, less, and equal.



cookies



Addition & subtraction in talk and action with objects:

For a game, 5 children want red blocks, but they find only 3 red ones in the toy box. They agree they have to find more.

Ally says, “We need 1, 2, 3,” touching each block and folding down a finger each time, then “4, 5,” leaving 2 fingers still extended.

“So that’s 1, 2 more we have to find,” she says as she holds the still raised fingers with her other hand.

Mathematize it: bring addition and subtraction to awareness

- Make & study representations of incidental or fictional problems
 - deliberate second presentation with objects used in ongoing stream of activity
 - model with toys, blocks or tokens, some specifically designed as mathematics manipulatives
 - represent on paper or board with iconic or symbolic drawings and marks
 - represent with numerals and other mathematics symbols (+, −, <, >, =)

Samples of types to model and study

- Change involving two sets
Start 5, put 2 here, put 3 there (take apart); Start 2 here, 3 there, get 5 (put together)
- Change a set
Have 5 get some added to it; Have 5 get some taken away
- Compare sets
5 children and 3 blocks

Model and study simpler and more difficult variations

- Make simpler or more difficult by changing
 - which term is unknown
 - how the story unfolds, is described, and is represented
 - which numbers appear (start under 5, think of the child's count list)
- Represent everything
 - the whole situation complete with the unknown term
 - the operations that lead to the solution,
 - and the solution.
- Use mathematical supports
 - like unit cubes or number lines throughout
 - clearly relate, at each point, the various representations used, especially relate the objects to number words and written numerals.

Children learn & invent operations: Take ♥♥♥ ♥♥♥♥♥

- Sum strategy: 1 2 3. 1 2 3 4. 1 2 3 4 5 6 7.
while tagging or moving objects or representations
- Count from first: (3) 4 5 6 7.
- Count from biggest: (4) 5 6 7.
- For division: distributive counting (sharing, dealing)
- For subtraction: often use counting up rather than counting down: "7 hearts hiding, the 4 green ones appear, and the rest are red? 5 6 7. So that's 1 2 3 red ones."

Geometry

Shapes

Spatial Orientation (and Maps)

Shapes

Enter with:	Preschool builds:
sense of closure, good form, symmetry	identify more 2- & 3-D shapes: different types & sizes, orientations & spatial transformations
recognize, classify by & name basic shapes: circle, rectangle (square), triangle	use both attributes & prototypes to identify & reason about shapes
	recognize subtype relations & part-whole relations among shapes

Problems with early shape ideas: aspect ratio and orientation.

- Problems:
 - Triangles without 2 equal sides;
 - Rectangles with all sides equal;
 - Upside down or tipped figures
- Solutions: analyze attributes
 - Straight or curved lines
 - Length and number of sides; opposite vs. adjacent sides
 - Size of angles – not degrees, angles experienced as turns (Logo)
 - 3 D shapes: faces, corners, edges
 - Get to attributes through challenging shapes: semi-circle, ellipse (oval), pentagon, hexagon, trapezoid, rhombus, and other parallelograms, right triangles, obtuse triangles
 - Which attributes stay constant over movement and transformations; which contribute to symmetry

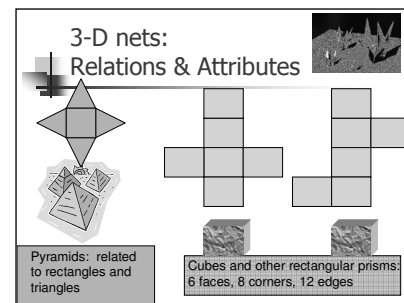
Mathematize sorting, naming, and constructing shapes ...

- Count, measure and compare lines, edges, faces, and angles
- Use manipulation and juxtaposition to resolve uncertainty due to orientation
- Mutual support between prototype recognition & attribute analysis
- Early on, mathematics explains intuitive reply after the fact
- Later, mathematics guides solution: plan, execute, monitor, check, explain, prove, repair

3-D nets: Relations & Attributes

Pyramids: related to rectangles and triangles

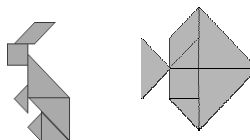
Cubes and other rectangular prisms: 6 faces, 8 corners, 12 edges



Spatial orientation

Using language, drawings, dioramas and maps

Tangram



Enter with:	Preschool builds:
use locations terms: above, over, below, under, on, beside, next to, between	use directional terms: left, right, forward, back
depict familiar spaces & routes in conversations and drawings	navigate space, following simple maps and spoken directions
	make models to serve as three-dimensional plans or maps
	add routes to drawings and maps

Routes from words, dioramas & simple maps

- words for relative position (inside, below, far, beside), for direction (forward, right), precise (next) and less specific (near)
- dioramas as 3 D maps represent classroom or location of school and neighborhood landmarks
- represent and “read” direct and indirect routes between places; give and follow navigational directions; monitor and check back with the map
- extend to include 2D maps drawn with symbols, including conventional orientation markers.

Tangram

Shapes function differently when given a different spatial orientation -- rotated or flipped. Children proficient with shapes and spatial orientation can plan ahead about substitution relations to exploit in a puzzle or block construction. A tangram is a puzzle made of 7 pieces arranged to make a shape. Tangram puzzle sessions can be scaffolded to accommodate growth and provide challenge.

Turtle from Ann Tompert's book *Grandfather Tang's Story* and an animated PowerPoint rendition by Sarah Fleeman (fleeman@dixieconnect.com).

Ideas to scaffold the tangram

- Who: Let the child ask and the teacher respond (reciprocal teaching); people in a small group take turns trying to place a piece.
- What is asked:
 - Give a model not just a word
 - Use all 1 color to see target shape, many colors to see solution
 - Model can be tangram pieces or a drawing
 - Drawn model can be full scale or small
 - Model can have internal lines, maybe with pieces separated
- Hints and advice
 - about which piece to try first/next
 - about rotating or flipping a piece

- via a running start piece placement or orientation change
- See <http://pbskids.org/sagwa/games/tangrams/>

Pipe cleaners to computers

Children make shapes and organize space with blocks, pipe cleaners, play dough, even fingers or other body arrangements. They draw and make designs on geoboards and computers as well as paper.

Computers allow children to act on geometric objects and to coordinate with and represent more abstractly what is simultaneously enacted with blocks or a group dramatization.

Measurement

Enter with:	Preschool builds:
Compare continuous quantity by	Measurement concepts and skills
directly matching items	appropriate units & tool for task
ordering sets according to continuous quantity (length, volume, weight, area, time)	partition
as bigger, smaller, longer, shorter	equal size units
	start below 1 at 0
	count iterations
	align tool – no gap no overlap
	use conventional measurement instruments

Measurement

- Can count dolls or trucks – not length of a truck or height of a doll
- Cannot count continuous entity or property like length
 - The whole is partitioned into units placed end to end in order to arrive at the amount of the whole
- Concept helpful for monitoring measurement attempts: Inverse relation between size of measuring unit and number of iterations. Only a few feet tall but many inches.
 - Common sequence: length, volume, weight (usually Kindergarten for area and time)

Vocabulary, procedure challenge, & a hint of more mathematics

- Descriptions (thin, thick, narrow, wide, shallow, deep); units (inch, foot, yard, meter, centimeter, mile, teaspoon, cup, pint, quart, ounce, pound, degree)
- Challenges to align measurement units (vertical orientation; slippery material; handling overhangs and incomplete unit...)
- What's below 1 – first hint of rational numbers (decimals, fractions)

Conventional and not

- Non-conventional units of measure (hand spans, tiny dolls, paper clips)
DANGER: if objects of unequal size (like a collection of sea shells), useless to count iterations, results not replicable, lose mathematics of measurement
ADVANTAGE: if objects equal size, can provoke direct and explicit explanations of, and practice with, mathematical units, partitioning, and counting iterations.
- Unit (inch/centimeter) cubes can be both conventional and not

Mathematics and ... Mathematics in ...

Incidental, Practice, & Intentional

- Play (almost ½ has mathematics; can become more complex and more useful)
- Environment -- enrich and use!
 - classroom and world
 - children's books
 - family (activity packets for home use)
- Other domains (science, social studies, literacy, physical education)

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Literacy in preschool

What is literacy?

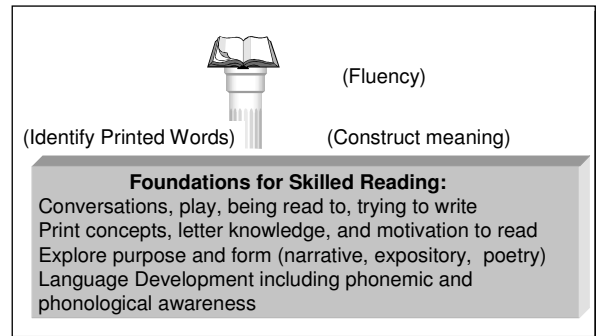
- reading and writing
- 3's & 4's do not usually make independent use of written words but do learn a lot about what literacy is and how it is used
 - beginning to see how words in print are linked to words that are read
 - getting ready to learn connections between sounds of language & symbols (letters) that represent them.

The Preschool Reading Pillar: Foundations Matter

Preschool Foundations for Skilled Reading

Readers' Theatre Literacy

- Children:
 - being read to, trying to write
 - print concepts, letter knowledge, & motivation to read
 - different purposes & forms
 - engaged, positively disposed
- Teacher:
 - designated reader and writer
 - engage, scaffold & assess



Readers' Theatre The End

• Children: - being literate with help - different forms & functions - enjoy narrative - informed via exposition - communicate literacy taste - display competence - engaged, positively disposed	• Teacher: - Designated reader and writer - Engage & Scaffold child literacy - Assess and differentiate
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Before preschool	During preschool
about using books • Recognizes some by their covers • Pretends to read them • Holds them so pages can turn • Labels objects in pictures • Ties pictures to people, places, and things she knows • May begin to recognize some print (letters in own name)	about written language • Shows interest in books & other material. • During read-alouds: ◦ Understands literal meaning. ◦ Recognizes sequence of events ◦ Connects to own life experiences ◦ Knows adults use print, not pictures, to read • Attempts to read and write ◦ during dramatic play ◦ to communicate or to remember
about being read to • Has a read-aloud routine • Asks to be read to • Comments on what is being read or what has been read about literacy • Can tell writing and drawings are different	about written words and letters • Knows letters are a special kind of graphic • Knows letters have names • Recognizes some words and letters in certain places • Can identify some letters by name anywhere (from own name, ...) • Can produce some letters

• Pretends to write Writing comes closer to adult model -- some letter-like forms, sometimes scribbles left to right and top to bottom, using spaces	• Know that different forms are used for different functions of printed language
about language for literacy • Enjoys rhyming language & nonsense word play ◦ Tingalayo, come little Donkey come • Listens to stories and explanations & asks questions about them	about language for literacy • Pays attention to separable & repeating sounds in language Willabee wallabee warco, An elephant sat on Marco! • When speaking, uses vocabulary and grammatical structures from literacy experiences • Can learn to identify beginning or rhyming sounds in salient words

Late Preschool - early Kindergarten	Late Preschool - early Kindergarten
about written materials • Knows the parts of a book & their functions; • Can name some book titles and authors • Tracks print when listening to familiar text or rereading own writing • "Reads" emergently, i.e., not verbatim or from the print alone • Switches from oral to written language style when "reading" • Retells or dramatizes stories or parts of stories • Answers questions about stories read aloud • Makes predictions based on illustrations or portions of stories and discusses outcomes	about words and letters • Knows that spoken words have a sequence of separable sounds • Knows the alphabetic principle • Performs some phonological (and some phonemic) awareness tasks • Knows some one-to-one letter-sound correspondences • Recognizes some words by sight about writing • Writes (unconventionally) to express own meaning • Independently writes many uppercase and lowercase letters • Uses phonemic awareness and letter knowledge to spell independently (estimated spelling) • Uses some conventionally spelled words • Writes own name (first and last) and the first names of some friends or classmates • When dictated to, writes most letters and a few words

Big ideas behind developing literacy proficiency

- Phonological awareness
- Comprehension
- Letter Knowledge
- Concepts of print

To quote quasi-hot news:

The National Early Literacy Panel: Findings from a Synthesis of Scientific Research on Early Literacy Development. National Reading Conference San Antonio TX. December 4, 2004.

Strong Predictors:

- Alphabet Knowledge
- Concepts About Print
- Phonological Awareness
- Invented Spelling
- Oral Language

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- Writing Name
- RAN (Rapid Automatic Naming/Lexical Access)
- Variables that are not in the table have not yet been demonstrated to be predictive of later conventional literacy skills.
- A very important interpretive caution for these findings is that these values reflect zero-order correlations
 - Correlations may reflect third variables.
 - Variables may share predictive variance.

Phonological Awareness Interventions

- The majority of these data, however, come from studies of children in the first grade or older.
- A search of the published evidence yielded approximately 55 studies of phonological sensitivity interventions with children who were in kindergarten or preschool.
- Of these, only 6 studies included primarily children who were preschool age. [highlight ours- PG, CK]

Phonological Awareness Interventions

- Byrne and Fielding-Barnsley have reported the most comprehensive examination of a preschool phonological sensitivity intervention.
- Their intervention involved teaching children to identify initial phonemes in words by matching words on the basis of initial sounds.
- Approximately 6 hours of exposure to this program, conducted by the experimenters, resulted in effects on reading skills that persisted for 6 years.
- A trial of the same program, but implemented by preschool teachers, also yielded positive immediate results; however, the overall size of the effect was not as large as that obtained in the experimenter implemented program.

***End of quote from* The National Early Literacy Panel: Findings from a Synthesis of Scientific Research on Early Literacy Development. National Reading Conference San Antonio TX. December 4, 2004.**

Preschool activities promote early literacy

1. Read alouds
2. Games/rhymes/lessons
3. Playful or pretend reading
4. Writing tries
5. Literacy in the environment

Reminder of the three kinds of teaching and learning

- Intentional teaching:
Children participate in sessions with systematic content-defined goals, dedicated time, and specific sequences of activities that are planned, carried out, monitored, and evaluated.
- Incidental learning:
As a part of daily living, in preschool and out, children witness, participate in, and learn from situations where problems are found and solutions are arrived at, many relevant to learning literacy.
- Practice:

Children consolidate knowledge and skills and develop dispositions for applying learning in various situations

Preschool Activities	Big Ideas			
	Phonological Awareness	Comprehension	Letter Knowledge	Concepts of Print
Read Alouds	√	√	√	√
Games Rhymes Lessons	√	√	√	√
Playful Reading	√	√	√	√
Writing Tries	√	√	√	√
Literacy in the environment	√	√	√	√

Key for using the “Big Idea & and Preschool Activities array”

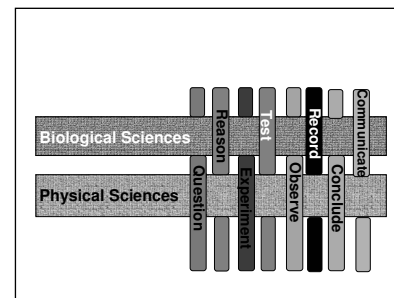
Large √ : the idea can be the object of intentional teaching and learning during the activity

Small √: the idea may be involved in the activity, depending on how it is carried out. The idea may be the object of incidental teaching and learning and/or child practice

Science in preschool

What is science?

Science education is a weave of topics and acts



The “what” of science:

- Physical Sciences describe and explain the universe and the properties of matter, e.g., density, displacement, gravity
- Biological Sciences describe and explain living entities, e.g., the characteristics and habitats of plants and animals, including humans

The “how” of science”

Inquiry skills weave together the topics in physical and biological sciences

- Question, Reason, Experiment, Test, Observe, Record, Conclude, Communicate

Children’s understanding of the natural world

Young children’s understandings are sketchy, linked to familiar activities, and often inaccurate

- mental representations or concepts are organizing structures for information & function as tools for thinking

Readers’ Theatre Science

Archimedes Principle: A solid object will sink in a fluid if its density is greater than the fluid’s density, and will float if its density is smaller.

Why is “Floaters & Sinkers” science?

- Physical sciences: buoyancy & density
- Disciplined inquiry: Questions, Reasoning and predictions, Replicated experiments, Observations, Descriptive records, Discussion & conclusions

What do children bring to preschool science activities?

- a very early and active interest in the physical and biological aspects of their worlds

Curiosity is universal but

- Individual differences, experiential and cultural diversity create a range of knowledge and skills
- Like adults, children are prone to misconceptions that can interfere with learning

What can children learn about science in preschool?

- Domain specific knowledge added to and made more consistent with scientifically accepted understandings
- Inquiry skills can be extended and become more disciplined

Before preschool: possible knowledge & skill	During preschool: building knowledge and skills
Related to Physical Sciences - Expected behaviors of objects - Objects are made of material substances - Some knowledge of planets, moon & stars - Cycles of day/night	Physical Sciences - Universe: - Objects in space - Sun as source of heat and light - Observable cycles - Earth - Weather Seasons Environments - Energy & Forces - Electricity Magnets - Matter

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	○ Natural Manufactured
Related to Biological Sciences • Living things move, grow, eat, & reproduce • Health related concepts , e.g., germs & contagion • Alive and not alive	Biological Sciences • Plants ○ Grow, breathe, reproduce ○ Need water, nutrients, air & light ○ Separate parts contribute to the whole ○ Adapted to habitats ○ Life cycles and patterns of change • Animals are like plants plus ○ Mobility Sensory systems • Humans are like other animals plus ○ Society Health issues
Inquiry skills • Observing with the senses • Describing physical properties of objects • Classifying objects on bases of observed properties • Describing actions of objects • Inferring cause and effect • Making generalizations • Making deliberate manipulations • Asking what, why, and how questions	Inquiry skills • Question & Observe ○ Ask questions ▪ related to facts or relations among concepts ▪ that can be addressed using observations or manipulations ○ Make observations & manipulations ▪ choosing appropriate sensory modalities ▪ choosing and using simple tools • Observe and describe ○ Describe properties, characteristics, functions and parts of objects ○ Articulate bases for categorizing objects ○ Describe sequence of events, interrelations, patterns and cycles ○ Describe transformations ○ Distinguish temporal and causal relations • Conduct simple experiments ○ Make predictions based on prior experience or reasoning ○ Make manipulations ○ Engage in an extended sequence of observations ○ Record and represent results ○ Reflect on results and discuss new ideas

How can science fit into the preschool classroom?

- A science curriculum can be integrated into existing centers, projects, themes, tables, & corners of a classroom
- Teachers can plan for intentional teaching with identified goals and objectives
- Teachers can take advantage of child or teacher initiated incidental learning

But isn't science everywhere?

- Some activities “look” like science but lack a coherent framework for weaving content and inquiry skills
- A curriculum provides for completion and coherence, gives guidelines for identifying existing concepts and misconceptions, and helps the teacher identify and meet the needs of each child

How about an example?

- A typical science lesson covering the human senses may include
 - Activity involving naming the body part responsible for each sense
 - Grab bag activity
 - Nature walk
- This may be insufficient to enhance children's knowledge of the biological world and their inquiry skills

"Feeling colors and seeing tastes"

- See handout list

Massey, C., & Roth, Z. (1997, April). *Feeling colors and seeing tastes: Kindergartners' learning about sensory*

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modalities and knowledge acquisition. Presented at the biennial meeting of the Society for Research in Child Development, Washington, D.C. Available at www.cis.upenn.edu/~ircs/pennlincs/elem/SRCD.pdf

- Yes, it, like most literacy studies is working with kindergarten children but it was adapted and used successfully in two centers with late 3 and young 4 preschoolers
- It is part of a curriculum development project for the *Science for Developing Minds Series* and has been supported by a grant from the National Science Foundation (ESI-92-52885).

Senses & perception

- First, create a sensory rich environment, ask children what they notice and how they notice it
 - Use a chart with pictures (e.g. of electric fan and body parts: skin, ears, eyes)
 - Discussion: do we rely a lot on vision? what other ways do we experience the world
- Next, problem-solving activities target each modality
 - how can we detect a difference among three bags that appear the same when eyes, ears, noses, mouths, and skin are used?
 - Children explore objects and find they need to use proprioception-- another sense "sense of heaviness"

Over the next 4-6 weeks

- Children practice being sense specialists
 - an "ear specialist" can hear a clock tick but cannot tell its color
- They investigate ways the senses are used together
 - sugar and salt look alike but taste different
- They explore the relationship between the use of modality-specific evidence and peoples' beliefs
 - if you only look at a painted sponge you may believe it to be a rock

What did the study of this unit reveal?

- The children taught with this new unit and a matched comparison group of children were tested on their ability to match different kinds of sensory information to the senses that process them:
 - Both groups of children overestimated what you can find out using your eyes:
 - The children who learned with this new unit performed significantly better across all modalities"

Characteristics of the unit

- It covers a small number of core conceptual points which
 - are aligned with recent science standards
 - address entering conceptions and common misconceptions
- It has an extended series of carefully sequenced and varied activities
- Learning opportunities vary: structured, direct explorations, visual representations of findings, & group discussion for reflection
- Inquiry skills are extended and practiced;
- Children are helped to expand, modify, apply, and integrate their concepts
- Materials are inexpensive and readily available

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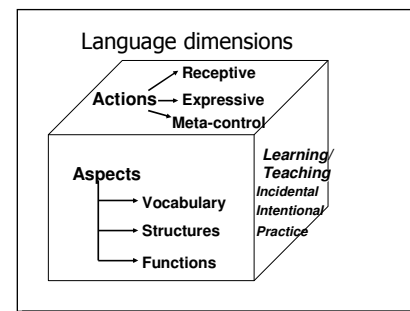
Language in preschool

The Language Dimensions

Actions: Receptive, Expressive, Meta-control

Aspects: Vocabulary, Structures, Functions

Learning/Teaching: Incidental, Intentional, Practice



Language

- In preschool, the child's explosive language growth places enormous demands on teachers to extend, elaborate, and exercise it
- Language is the medium of expression for the other content domains (no separate scene!)

Children and teachers

- Preschool children do **NOT** need to know terminology about language. Just do it!
- Teachers use knowledge about language
 - to communicate with educators & parents about language development for each child
 - to plan, implement & evaluate activities focused on developing preschoolers' proficiency with language actions re: vocabulary, structures & functions
- A 3 or 4 year old's language is not uniform
 - may use some pronouns (I, me, you) easily but avoid or be frustrated with others (hers) (herseses)
 - may be at ease with questions like 'Who is sad?' but not with ones like 'Who does Harry like?'
- Engaging, responsive conversation is a support system for language development
- Identifying language content for preschools does not replace or rule out an engaging, responsive language learning environment in preschool

Dimension 1: Language Actions

Receptive acts (understand language)

Expressive acts (produce language)

Meta-control (sensitive to & aware of the form of language acts, manipulate aspects of language)

Dimension 1: Cooperative & intermingled actions in play

Marc: I want a red one (picking a crayon to draw with)

Nina: I want a green one (also picking a crayon)

Marc: I want a blue one (a hint of mimicking Nina in it)

Marc's first utterance (expressive act)

Nina takes Marc's utterance (receptive act) and builds on its patterning (expressive act ? meta-control)

Marc builds more (receptive, expressive, meta-control)

NOW meta-control flourishes in the group:

Lia: I want a glue one (Giggles start as meaning is odd but structure pattern stays)

Tyrone: I want a chew one (A clear breach of language structure brings many giggles)

Lia: I want a goo one (Even more giggles as the line between known words and just sound play approaches)

Nina: I want a gafoofy one (An invention of a lovely pseudo word gets laughs)

Marc: I want a poop one (Guilty giggles over word in dangerous domain of bodily functions)

Teacher: I want a new one! (Surprised and relieved laughter from all)

Teacher maintains the language play but redirects the group away from words not encouraged in the classroom.

Actions: Receptive

- understand & respond to words & sentences, listen
- receptive proficiency usually precedes expressive
- needed just for imitation -- giraffes!
- easy to overestimate in "here and now" conversations with context clues replacing receptive proficiency

Actions: Expressive

- produce language as speech (talk), sign, or writing
- easy to underestimate
 - e.g., lost if topic is farm animals but confident if talk is about public transportation
- and to overestimate
 - A rose may be a tulip and a daffodil, too!

Actions: Meta-control

- act on language form to save communication, for fun, as task
- window: looked through, not noticed; for meta-control look at the glass/language not just through it (Luria); includes phonological awareness & metacognitive comprehension work!
- metalinguistic: what's a word? oral language not just literacy
- clarification: language form controlled for communicative intent; children can request others to clarify before they can notice own problems or answer requests to clarify
- Special topics: Sensitivity to epilinguistic patterns & Politeness as sociolinguistic conventions of school
- Sensitivity to patterns (epilinguistic): staging ground
 - later metacognitive vocabulary & structure choice (phonemic awareness)
- running starts even when child can't answer a direct request or know what "rhyme" or "opposite" means
 - "hen, then, ken, ..." and child might chime in "pen"
 - "big, small; dry, wet; hot, ..." and child says "cold"
 - "Willabee, wallabee, woo, the elephant sat on ..." "Sue"
- Pleasure – play and aesthetics. As the play queen, a child says 'cannot' and switches to 'can't' when stepping out of play to answer a question. But the same child might not be able to clarify her "can't" as a form of "cannot" when having trouble being understood in a conversation.
- Politeness and other sociolinguistic conventions of school: getting the facts and using the rules
 - How do you get a turn at talk? when to raise your hand and wait to be called on and when to just chime in?
 - How do you figure out what is on topic and what is out of bounds as a remark in school? What makes a good contribution to lessons? When is it important to give a different answer than a classmate and when is the same answer not only okay but the best possible one?
 - What is a story -- what is the same about stories in spoken and written language and what is different? Is a catalogue a story book?
 - Etc.

Dimension 2: Aspects of Language

Vocabulary Structure Function Interrelated in use, but...

Aspects: Vocabulary

- Vocabulary not just word list with definitions
- To know a word: know concepts, other words related to it & situations in which it can be used
- Knowledge of a word grows & changes over time, more sophisticated, more useful for serving the speaker's goals to learn & communicate
- Words to
 - refer to objects, actions, events...
 - describe relations, space, time, quantity...
 - perform language tasks: prepositions, conjunctions, and pro-forms (me, what, do, there)
- Vocabulary learning
 - incidental during casual or arranged experiences
 - intentionally taught lessons and mini-lessons
 - practice: teacher arranged & spontaneous
- Display vocabulary knowledge
 - by pointing to pictures or to the 'here and now' world

- functional definitions (spoon is used for eating soup)
 - categorical relations (spoon is a utensil like a fork)
- Once there are enough words, the 'here and now' becomes a stepping stone instead of a limit
 - Finding out about tadpole is easier when you have the words baby and frog in your vocabulary

Partial knowledge of vocabulary items

- Word knowledge may be partial:
 - 'Mikey redded me' -- adjective treated as verb; later verb 'reddened' different structure & use
 - 'Car' -- but without super-ordinate (vehicle), sister node (truck), subordinates (limousine, sedan,) or (Chevy, Ford)
 - but trouble with operational definitions
 - toy VW with pedals in play-ground
 - the "horseless carriage" in a museum
 - but limited use: object of verbs 'drive' & 'smash' but not subject of 'smash'
- repeated salient receptive & expressive acts with a word place it more firmly in a network of other words. **A vocabulary lesson is just part one of a continuing saga**

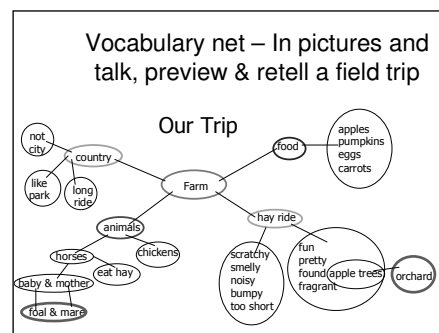
Vocabulary items not independent of each other

- 6 years - 6,000 words (10,000 counting +{s} etc.)
- belong to nets with categorical (like for 'car') and functional relations (as situations become mental scripts/schemas)
- add to familiar nets, form new ones, reorganize
 - new food words added to familiar net during play in the housekeeping corner with children from different backgrounds, during cooking time with the teacher, on field trip to a farm or supermarket, from books of fiction and nature studies
 - features about a bunny come to attention when rabbit and hare are added to the vocabulary and the net for animal words may be reorganized

Vocabulary net – In pictures and talk, preview & retell a field trip

Vocabulary: Which words?

- common actions, more differentiated words
 - eat: taste, chew, swallow, gobble, munch, nibble
 - run: scamper, jog, dart, scurry, dash, lope
- words for cognition, perception, emotion, communication
 - subtle restrictions: "Say me– tell me about the olden days, Ms. Helen."
- More differentiated modifiers
 - excellent, delightful, excited, worried, frightened, carefully, thoroughly
 - comparatives (smaller, more lovely), superlatives (smallest, most lovely); opposites (rough, smooth)



And the little words that carry a lot of the load

- pro-forms
 - confident about essential personal pronouns (I, me, my, etc.), question words (who, what, etc.), demonstratives (this, those, etc.), pro-forms that take the place of phrases (e.g., 'there' in the place of a preposition and noun indicating location, 'do it' in place of a whole verb phrase like 'open the door')
 - still a challenge: reflexive pronouns (herself, themselves) and reciprocals (e.g., each other)
- repertoire of prepositions and conjunctions widens and deepens

Dimension 2: Aspects Structure

- units and ways the language combines them
- Phonology: units of sounds; /m/ that begins and ends 'Mom'
- Morphology: units of meaning 'teachers'

- 3 units in 1 word: root verb {teach}, suffix {er} indicates an agent, suffix {s}, indicates plural
 - distinguishes among the classes of words – for example, nouns, verbs, adjectives
- Syntax: about the form of phrases and clauses
 - main and subordinate clauses
 - clauses have words & phrases that fill grammatical roles (subjects, predicates, objects, and modifiers)
- Semantics: about the interpretation of phrases and clauses

Structures: Phonology still developing during preschool

- Phonology (some examples):
 - Final voiced consonants (until about 3½) mug-muck; bam-baa;
 - Continuants sap-tap; vein-bane; zap-dap
 - Medial unstressed syllables (until about 4) bicycle-biskle; beautiful-byuful
 - Clusters and liquids (even as they leave for K) trucking- chucking; leg-weg (or yeg);

Structures: Two girls and their language

The teacher asks about a story she just read to a small group, “Did that giant eat fast?”

Dionna answers, “He ate fast.”

Hetty doesn’t wait for the teacher to respond. She jumps in saying, “So fast that boy didn’t got none of that parsnip stuff.”

- If generalities about complete sentences, correct grammar, politeness, and elaborated language are all that a teacher has to work with, he or she might rate Dionna’s response as better than Hetty’s.
- Teachers aware of language structure recognize that Hetty’s utterance is quite an accomplishment for a preschooler, the kind of advance to reinforce by responding in substance to it.

Structures: So fast that boy didn’t got none of that parsnip stuff.

- Incomplete sentence? subordinate clause alone entirely acceptable in conversations
- Negative concord (“didn’t” & “none” instead of “any”)? incorrect for formal expository writing, but not an issue in chats with 3’s & 4’s developing structures in expressive acts
- “stuff” not to worry about given attempt to use “parsnip”
- jumping in impolite? but a rich follow-up to the teacher’s initiation, inviting productive new directions for the topic
- Hetty’s turn gives evidence of her language accomplishment and offers the teacher conversational options that can support further language and literacy advances for her and other children in the group

Developing structures alert teachers can support

In single clause sentences (some examples):

- Indirect objects (dative) with direct objects
 - Jerry drew me a picture?
 - Who drew a picture for you?
- Some passive sentences
 - Elmo won’t be attacked by ninjas in my story.
 - What was all eaten up by Goldilocks?
- Elaborated noun phrases:
 - The really nasty old rusty nail scratched me.

In multi-clause sentences (some examples):

- Infinitive clause objects, different subject than main
 - Sandy needs me to drive it. (easier: I need to drive it.)
- Clauses not at the end of a sentence
 - The man who laughed is the good guy. (easier: I saw the man who laughed.
- More than two clauses
 - We want the story you read when you were here before.

Word class elaborations (some examples):

- Verbs: tense, agreement I ate (eaten). He has (haves) hats.

some uses of modals verbs should, could, would

some uses of verb to be: has been running

- Quantifiers: Nobody has any red paint today.
- Meaning and class changing morphemes: (Derivational)
She was unhappy but now she's unsad.
I'm a painter and you're a chalker.

Dimension 2: Aspects Function

- Pragmatics: How to use language to change the world around us -- and ourselves
 - personal and interpersonal functions
- Rhetoric: Multi-utterance, multi-person forms function with power – and beauty

Aspects: Functions

- language functions with peers, adults, even when someone is all alone
- reading & play: language functions in two contexts at once
 - the play kitchen & a restaurant
 - the reading rug & the tree that the peddler naps under
 - “decontextualized” better “recontextualized”
- through reading, rare functions can be introduced
- during play, functions can be practiced
- in other domains (sciences, mathematics, art), both functions and structures of language can be incidentally and intentionally taught and learned

Pragmatics - personal functions

- To remember
- To regulate behavior
- To reason through an issue
- To solve problems
- Talking to yourself/private speech not necessarily immature
 - personal pragmatic functions part of socio-emotional development
 - can move from other to self
- X down, around, and tight. Bunny ear, bunny ear, that's right!
- Down and up around, around. That's my B!
- Okay, all green up there for the tree. This pink piece for the store... Yes!
- I'm keeping quiet for my turn, keeping quiet for my turn, keeping quiet for my turn.
- Shake it just a little. Not too hard. Don't want to break it. Just a little harder...
- Here's my blankie, here's my thumb, no crying.

Pragmatics - interpersonal

- greet people, identify yourself
- ask for/give help, describe emotions
- share opinions, get/give information
- report events, stories, make sense of new or unexpected
- entertain
- negotiate solutions
- etc.

Aspects: Function Rhetoric

- Everyday examples: jokes, conversations, recipes, editorials, letters, lessons, and menus
- Lofty examples in prose and poetry: expositions of science or religious thoughts, epics, lyrics, novels, sonnets, and plays for performance through the ages
- Norms for suitability, clarity, and effectiveness differ for different rhetorical types

Literacy sessions can...

- introduce new rhetorical types
- allows explicit inspection of, reflection on, & practice with the features and purposes of different rhetorical types

Language Variability in Acts and Aspects

- Individual development differences among children extreme during preschool
- Situational, participant & task differences can show that a single child varies in proficiency
- Dialect and language differences – each has all three acts and all three aspects
- EAL - English as an additional language
 - not “subtractive bilingualism” – children away from their family can miss opportunities to develop their first language and if preschool does not provide sufficient support the child has no chance to learn the new language fully, thus a loss

Dimension 3: Teach & Learn

- Incidental
- Practice
- Intentional

Teach & Learn: Incidental

- TALK WITH KIDS, help them to talk with each other, and send talk home
- new or refined vocabulary, structures, and functions in daily life and during literacy, science, mathematics
 - adult takes opportunity to model, cue, and prompt more elaborate language
 - children overhear adults talking (with parents, teachers, special guests) and role play new language
 - written language read aloud is a jump start
- Noise can inhibit full participation in language interactions that growing children need

Teach & Learn: Practice

- Practice consolidates learning so it can be relied on where & when called for
- New language fades into background; child gets on with the living that the language accommodates and enriches
- Practice varies:
 - noticeable/formal: finger plays, rhymes, repeated stories
 - routine exchanges during everyday events
- Design centers & events to connect to chances for practice in the community and at home (foster transfer & generalization)

Teach & Learn: Intentional

- systematic content, defined goals, dedicated time periods, specific sequences of activities that are planned, carried out, monitored and evaluated.
 - share content & time (science/mathematics/art/cooking...) but goals, monitoring, follow-up specific to language.
 - for less frequent vocabulary, structures, functions:
 - escape the ‘here and now’ (that helps too much and reduces the press for communication with language)
 - use mini-lessons to model, recast children’s utterances, elaborate them, and respond to children’s more advanced language in order to motivate and reinforce it:
 - remembering yesterday’s visitor
 - planning next week’s special day in the garden with high school kids

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