Playing: The Math Path

Understanding the nature of play as the key method in effective learning - It should be child-directed and adult facilitated - leading to Pure Play

- The Learning Pyramid
  - Hear a story
  - Watch someone do something
  - Do something yourself

- What is Pure Play? The child will show:
  - Choice
  - Determination
  - High Focus

- What is Play Facilitation? It is the highly refined art of teaching without instructing!
### Predictable Play Behaviors

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<th>Basic</th>
<th>Transitional</th>
<th>Complex</th>
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<td><strong>Materials</strong></td>
<td>My space is my own and I am free to have loose parts scattered about</td>
<td>That inspires creativity and purpose, where I can play with one or two others, a space that we can</td>
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<td></td>
<td>Alone and where play with friend is an optional, 1 to 15 minutes</td>
<td>With peers, enough time to reassign roles, 15 to 45 minutes and provide notice of time ending</td>
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<td>Things that have various textures and enough things - where sharing isn’t required! A wide variety of similar things, things that can be done over and over, things to haul around with ways to haul them. More loose parts should be visually accessible to many play areas so that the children can get additional loose parts as they need it during play.</td>
<td>Access to lots stuffs, allows children to change the rules and inspires creativity and stories. Many different types of loose parts should be available for children to acquire as they need it for play.</td>
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- Do not interrupt play but when a child comes with an observation - Learn to ask a probing question
  - What/why do you think that is so?
  - How so?

What children need to achieve Pure Play:

- All children will require various accommodations during play to maximize the developmental benefit of play. Generally speaking they may need:
  - a greater/smaller separation from other children
  - additional/less time
  - more/less or different materials
- Each of these variables can be judged by the quality of each child’s play and then adjusted as needed.
- Children with special needs may require additional adult observation to assure a quality play experience so that appropriate adjustments to time/space/materials are made in a timely fashion.

In ALPHA Play Tier (Basic and Transitional Play Phase)
- Space: My space is my own and I am free to have loose parts scattered about
- Time: Alone and where play with friend is an optional, 1 to 15 minutes
- Materials: Things that have various textures and enough things - where sharing isn’t required! A wide variety of similar things, things that can be done over and over, things to haul around with ways to haul them. More loose parts should be visually accessible to many play areas so that the children can get additional loose parts as they need it during play.

In BETA Play Tier (Transitional and Complex Play Phase)
- Space: That inspires creativity and purpose, where I can play with one or two others, a space that we can make our own
- Time: With peers, enough time to reassign roles, 15 to 45 minutes and provide notice of time ending
- Materials: Access to lots stuffs, allows children to change the rules and inspires creativity and stories. Many different types of loose parts should be available for children to acquire as they need it for play.
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The five logic foundations upon which mathematical skills are scaffolded:

Classifying: Sorting or forming groups of similar things

- Seeing like and different
- Sorting things by one characteristic
- Noticing multiple characteristics within a group of items and regrouping items based on another characteristic
- Grouping items based on a missing characteristic
- What a child needs to experience pure play and discover a new aspect of classifying
  - **Hear** a story: I’m Taking a Trip on My Train by Shirley Neitzel - Scholastic (pointing out the same and different characteristics of the train cars)
  - **Watch**: As someone else separates their things into groups
  - **Do**: Notice characteristics of same and different among a given set of objects - sort similar items into two groups

Comparing: Recognizing the relationship between objects

- Comparing amounts, volume or size
- Comparing the number of things
- Comparing sets - one to one correspondence
- What a child needs to experience pure play and discover a new aspect of comparing
  - **Hear** a story: The Mitten by Jan Brett - Scholastic (pointing out the growing size of the mitten based on the growing size of the animals)
  - **Watch**: As someone else makes a large set, a medium size set and small set
  - **Do**: Make a long line, a medium line and short line of things
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Ordering: Putting things into a logical series
- Notice that objects that are similar come in sizes
- Lining things up by size - small to large
- Lining things up by quantity - least to most
- Arranging events by time - first to last or morning, noon and evening
- What a child needs to experience pure play and discover a new aspect of ordering
  - **Hear** a story: The Grouchy Ladybug by Eric Carle - Harper Collins (pointing out the orders - size of animals and time)
  - **Watch**: As someone else line their things up in order of small to big
  - **Do**: Notice characteristics of size among a given set of objects - put them into some logical order

Patternning: Putting dissimilar things in order by use of repetition
- Noticing that there is repetition - like stripes on clothing
- Pointing out and talking about patterns found in typical child settings
- Using loose parts to make two/three/four component patterns
- Continuing a pattern that is started
- Filling in components in a pattern
- What a child needs to experience pure play and discover a new aspect of pattern
  - **Hear** a story: Put Me in the Zoo by Robert Lopshire - Random House (point out the changing visual pattern)
  - **Watch**: As someone else organizes an A/B/C pattern
  - **Do**: Notice characteristics of given set of objects - build a pattern with the object 3 repetitions long
Problem solving: Realizing when something is amiss and gathering resources and people to resolve the issue

- Voicing the characteristics of the problem
- Plan a strategy
- Choosing items to solve the problem
- Getting the necessary items to the site of the problem
- Applying the strategy to success or revising plan
- What a child needs to experience pure play and discover a new aspect of classifying
  
  - **Hear** a story: Too Many Babas by Carolyn Croll - Harper and Row (pointing out what was the problem and how was it resolved)
  - **Watch**: As someone else builds a structure for a bug's house
  - **Do**: A bug needs some place to live
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Reference books and reading books used during workshop

Reading Aloud Across the Curriculum
Lester L. Laminack and Reba M. Wadsworth
Heinemann

Put Me in the Zoo
Robert Lopshire
Random House
New York, NY

I’m Taking a Trip on My Train
Shirley Neitzel
Scholastic Inc

The Grouchy Ladybug
Eric Carle
Harper Collins Publishers

The Mitten
Jan Brett
Scholastic Inc
New York, NY

Too Many Babas
Carolyn Croll
Weekly Reader Books
Columbus, OH

Mind In The Making
Ellen Galinsky
Harper Collins Publishers
New York, NY

Einstein Never Used Flash Cards
Kathy Hirsh-Pasek, Ph.D. and Roberta Michnick Golinkoff, Ph.D. with Diane Eyer, Ph.D.
Rodale