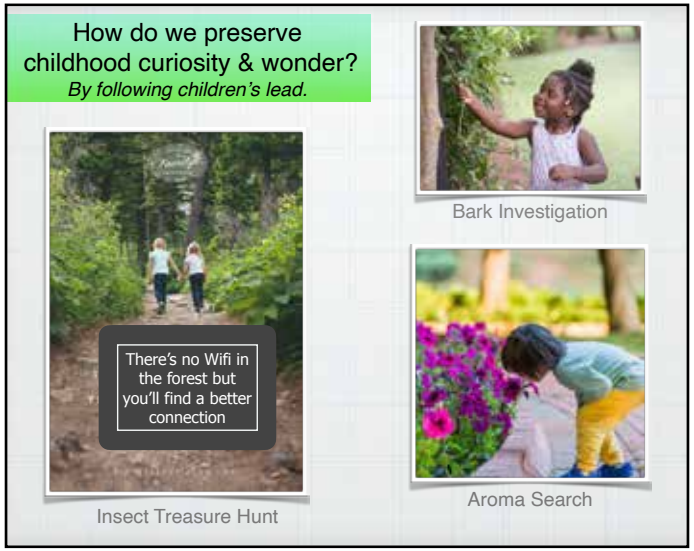
CREATIVE PLAY LA

STEM & CREATIVITY

IN THE OUTDOOR CLASSROOM

WITH ANNA REYNER

HANDS-ON PROFESSIONAL DEVELOPMENT/EARLY EDUCATION



STEM & CREATIVITY in the Outdoor Classroom
by Anna Reyner, MA

There's a global movement to have more outdoor nature play for children and families. Children need and benefit from time spent outdoors, which is where you'll find the STEM! This workshop focuses on activities that teach early math and science concepts. It suggests you look for teachable STEM moments in everyday activities.

Early math & science foundations are very inter-related. Preschool math concepts overlap with preschool science concepts. In the field of mathematics, the skills of classifying, comparing and measuring are referred to as Math Concepts. In the field of science, these skills are referred to as Process Skills. To learn about these ideas, check out California's Preschool Learning Foundations at www.cde.ca.gov-/sp/cd/re/psfoundations.asp. But meanwhile, here are the basics, and where we begin here.

1. PreK Science Observing / Comparing / Classifying / Measuring / Communicating / Inferring / Predicting.

2. PreK Math Number Sense / Algebra and Functions / Measurement / Geometry / Mathematical Reasoning

As you look at these 42 STEM ideas, put on your "math & science" thinking cap. With that mindset, you'll soon discover how to teach STEM with greater INTENTION, simply by reframing your own point of view. Ask yourself HOW does this activity engage the Science & Math skills listed here? The answers are there for you to figure out. Let's have fun learning together, shall we?

1. Bark Investigation
Observe and investigate the bark on a tree.

2. Aroma Search
Smell the flowers or bushes in your neighborhood and compare their scent or aroma.

3. Insect Treasure Hunt
Look for insects in your neighborhood. Draw pictures of what you find.

THINK ABOUT IT!
Math is part of children's everyday lives. Taking advantage of math moments develops math learning. Each math moment reinforced by a caring adult helps children become ready for more math learning.

LOOK FOR IT!
Review this checklist of math & science foundations. What will you say or do to enhance learrning?

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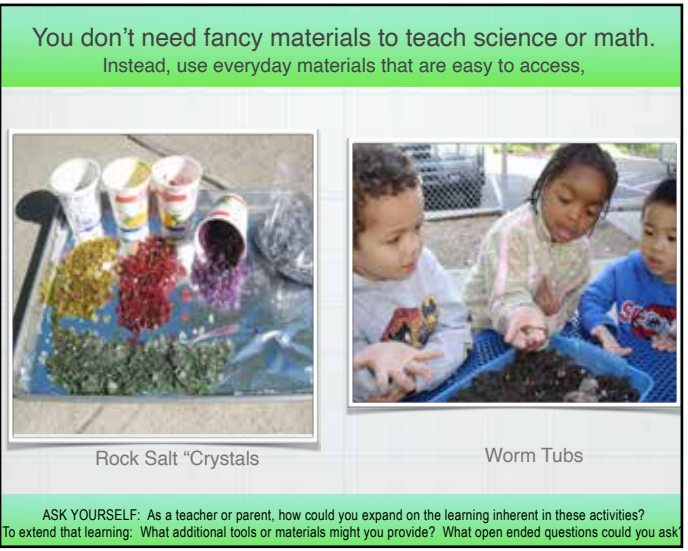
4. Mud Painting
Make mud with dirt & water, and paint with it on brown paper or grocery bags.

5. Sand Coloring
Put sand in bins and color it with liquid watercolor. How many colors can you make?

6. Sand & Glue Art
Make marks on paper with white glue and add sand on top. Add other nature elements. like twigs or seed pods.

THINK ABOUT IT!
What is Number Sense?
Number sense is a broad term that refers to a group or set of skills that are needed to perform basic math operations.You might think that number sense is just simple counting and that young children will master number sense quickly. However, number sense refers to deep understanding of HOW numbers work. It will take some time for young children to master these skills!



7. Rock Salt
"Crystals" Paint rock salt by soaking it overnight in food coloring or Liquid Watercolor. Great for sand tray play, these colored salt crystals look like chunks of quartz when soaked with color. Find rock salt (also called Ice Cream Salt) in most grocery stores.

8. Worm Tubs
Wait for after a heavy rain, then search for worms outside in your neighborhood. Place some dirt in a plastic tub and place worms in it. Observe, measure and compare them before returning worms to their natural habitat.

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9. Glitter Paint Suncatcher

Drip glitter paint onto a piece of waxed paper ("Cut Rite") add 2nd piece of waxed paper on top and squish to make design. Dry. Hang in window.

10. Salt & Watercolors
Tape white paper down to a table so it stays flat. Place salt and liquid watercolor in small cups for open ended art. Paint with watercolors then sprinkle salt on top and watch what happens.

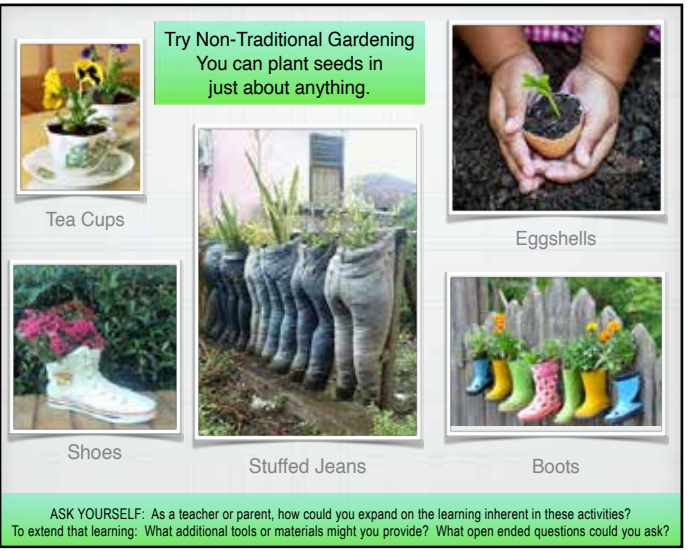
11. Contact Paper Window Art
Place leaves and thin collage papers on the sticky side of contact paper, then secure sticky side to a window for see-through collage art.

12. Nature Mandalas
Gather natural materials and make circle patterns (mandalas).

13. Flower Petal Mandalas
Find flowers of different colors, gently remove petals, arrange petals in a circle pattern. Document by drawing a picture of it or sending a photo to a friend.

14. Rock Spiral Designs
Gather pebbles and rocks. Create a spiral design. Start designing from the center for your first one, then try starting from the outside for another one. Which is easier, and why?

THINK ABOUT IT!
Math is important and it's important to help young children develop their mathematical thinking. A child's math knowledge at the start of kindergarten predicts later academic achievement better than early reading or attention skills.



15. Eggshell Planter
Gently break egg shells in half and plant small seeds.

16. Shoe Planter
Take old, recycled shoes and boots and re-purpose.

17. Tea Cup Planter
Tea cups and coffee mugs don't have drainage holes so water lightly.

18. Jeans Planter
Its fun to see plants grow in old clothes! Amuse yourself and your neighbors.

THINK ABOUT IT!
Talking about math is also important and every bit of math talk helps. Research shows a small increase in math talk, such as asking about how many objects there will be if we add one or take one away, brings big results.

19. Plant Wheat Grass

If you want to make friends with a cat, buy wheat grass seeds and plant them. They are easy to grown in a sunny window and fun to watch. Cats love wheat grass and it's healthy for them.

THINK ABOUT IT!
Math is measuring, sorting, building, noticing patterns, making comparisons, and describing the environment, as well as counting and knowing the names of shapes. There are many ways to incorporate math learning into everyday moments

20. Watercolor Relaxation
Paint with watercolor paint cake strips. Use different size brushes. Take your time, slow down. Take 3 deep breaths. Relax your shoulders and let go of your worries and cares.

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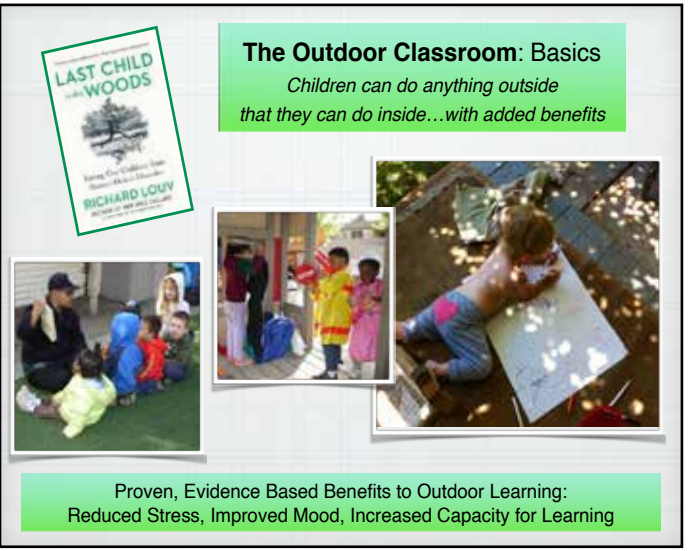

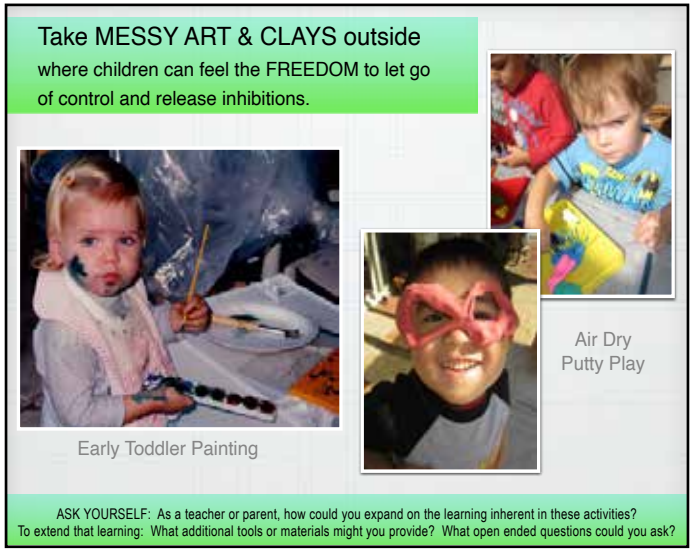

7. Fresh Air Stories
Read a book to children outside on the grass.

8. Outdoor Drama
Play with dramatic play costumes in your outdoor playhouse.

9. Lie Down Drawing
Draw with crayons on BIG white paper while lying down on your paper outside.

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10. Toddler Painting
Paint with washable cake watercolors. Use an upside down plastic bin as a table.

11. Air Dry Putty Play
Experiment with colored doughs outside. Air Dry Putty is particularly fun and easy to work with (Model Magic or Colorations brands). Air dry putty comes in white and colors, try both. Add color to the white version by adding colored markers.

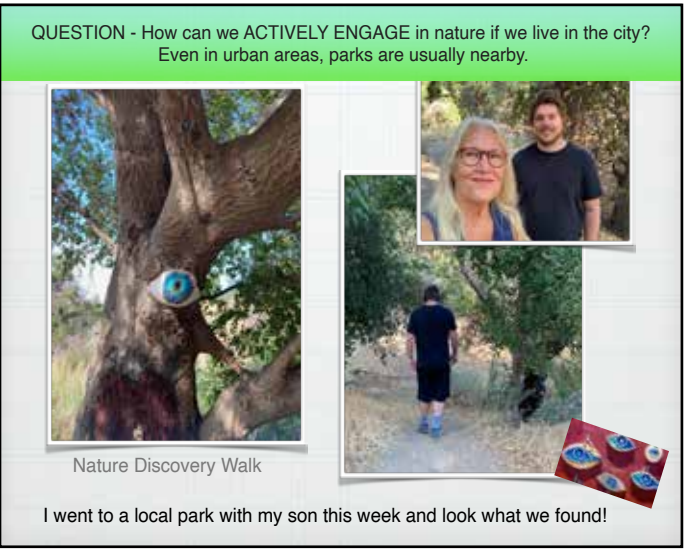
THINK ABOUT IT!
An environment where there is no one right answer for every problem encourages creativity.

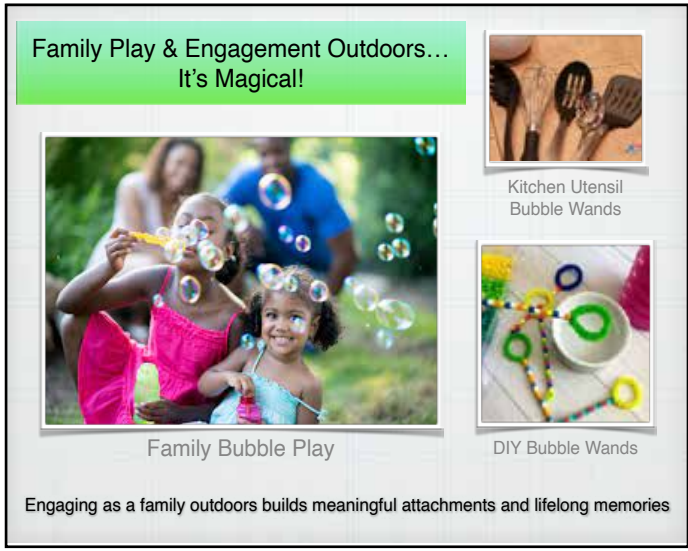
Teachers who enthusiastically encourage children to develop more than one solution to a problem see greater creativity in problem solving.

12. Group Easel Painting
Duct Tape cardboard boxes (cut bottom 3-4") to your table to create a group painting area.

13. Nature Sketching
Sketch outside from nature, using portable sketch easels. DIY from heavy cardboard and big clips.

THINK ABOUT IT!
Nurturing creativity starts with an image of children as wise and capable decision-makers. Children are born predisposed to be creative. It is our job to nurture children's creativity and allow it to flourish and find expression.





14. Nature Discovery Walk
Go on a Nature Walk with your child and look for changes in the environment since you were last there. Talk about the changes, and ask your child open ended questions about the plants you find. Consider leaving a creative mark for others to see,
like this painted eye we found in our local park.

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Hands-On Art / Workshop Activity

15. Sensory Science Memory:
In today's workshop we practiced guided meditation and recalled sensory science memories from our childhood. We first did relaxation and breathing exercises together.

We closed our eyes and followed our leader's guidance, going back in time, to our "earliest sensory science memories."

We drew our best sensory science memory on paper. Then we shared our drawings and memories with colleagues in small break out rooms.

16. Family Bubble Play
Make your own bubble wands and bubble solution, you'll find plenty of DIY ideas and bubble solution recipes on the internet.

17. Kitchen Utensil Bubble Wands
Check your kitchen drawer for whisks and spatulas, anything with holes…Dip in bubble solution and blow through the holes.

18. DIY Bubble Wands
Use pipe cleaners for DIY bubble wands, add beads or wrap small sticks.

THINK ABOUT IT!
It's important to believe your child can get better at math and develop mathematical skills. Growth mindset, the belief that we can keep learning and getting better at math, is very important in supporting children to become mathematicians.

Family Creativity is **Powerful**!

Observational Painting from Nature

Family Nature Portrait

Water Plants Together

Build a MAKER SPACE…in YOUR home.

It's easier and less expensive than you may think. And it's way more valuable than having an area for toys

Maker Spaces support a **GROWTH MINDSET**…

It's important to BELIEVE your child can get better and better at math & science skills with practice.

GROWTH MINDSET, the belief that we can keep learning and getting better, is important in supporting STEM skills.

19. Observational Painting
Collect gourds or seed pods from your neighborhood and practice "observational drawing and painting" with your family.

20. Family Nature Portrait
Take a family walk outside and take a "selfie" portrait with a nature background. Find the sunlight overhead, and make sure it's on your faces for the picture. Draw it when you get home.

21. Water Plants Together
Ask parents to actively engage with children during garden time using inquiry language and math and science "talk".

Ask children: What do you think? What will happen next? How could we do it differently? What else could we try?

THINK ABOUT IT!
Parents can foster a positive attitude toward math. When parents find math activities that THEY enjoy and feel confident doing, children are more likely to enjoy them too.

22. Create a Maker Space
Dedicate an area in your home and create a permanent Maker Space, using inexpensive items as shown above, or items from yard sales or thrift stores.

THINK ABOUT IT!
Develop children's creativity and critical thinking by providing a rich physical environment for children to "tinker in" without the pressures of time or the pressure of creating products that will be judged.

Time to play, experiment, have fun, set aside electronics, make mistakes and exercise a "what if" mentality…these are some of the positive benefits a Maker Space provides.

23. Create a Pegboard Maker Space
Set up a Maker Space at home, using a pegboard. Make your own inventions, relax and tinker, use your imagination. Add new natural materials often, find loose parts to use.

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Bring Gardens Inside with Collage Art / **My Garden Wall**

Collage Art offers children the ability to think critically and solve problems with loose parts in a systematic and organized way.

24. Garden Wall Collage
Make garden collages on brown paper bags or brown Kraft paper. Supply a variety of collage materials for all family members to design their personalized garden walls.

THINK ABOUT IT!
Do you ever find yourself trying to avoid mistakes, and do things perfectly? Our desire to do things "right" and strive for perfection often gets in the way of play and creativity.

Mistakes are important to embrace in life. It's okay to make mistakes! Mistakes help us learn! Children benefit from teachers and parents who focus on problem solving and using mistakes as an opportunity to promote growth mindset, "Let's try again" is a very positive, growth minded message.

Create an Effective Science Center in your window

25. Simple Science Center
Make a window sill into a science center. Take clear contact paper and press leave onto sticky side, then adhere it to window.

26. Oil & Water Bottle
Add oil and water to a bottle with food coloring. Shake and watch liquids separate.

27. Specimen Jars
Find nature objects outside and place in an observation jar. Describe. Sketch.

28. Weather Inquiry
What's the weather like today? Post a Weather Question and talk about it regularly. How does the weather change where you live, from hour to hour, from day to day, from season to season?

Use "math talk" when engaging in everyday activities

Encourage critical thinking by actively listening, then asking open ended questions.

Compare & Contrast
Ask: What do you think will happen IF....

ASK YOURSELF: As a teacher or parent, how could you expand on the learning inherent in these activities?
To extend that learning: What additional tools or materials might you provide? What open ended questions could you ask?

29. Baking with Math
Cook together using "math talk" to explore the ingredients and the baking process. Is this more sticky, or less sticky? Do you think this bowl is big enough? How high should we fill each muffin tin? I wonder why…what do you think?

30. Table Easel Painting
Paint on a table easel outside. Make your own easel using clips and a board. Engage your child about their painting process, using open ended questions. Provide alternatives to traditional paint brushes.

31. Dried Weeds / Specimen Search

Find some dry weeds that seem to be neglected and investigate them. Look closely and see if any of the dry plants are still alive. Gather as many different weeds as you can, then take them home to clean first, then study and draw.

THINK ABOUT IT!

What is Number Sense?

Number sense is a broad term that refers to a group or set of skills that are needed to perform basic math operations.You might think that number sense is just simple counting and that young children will master number sense quickly. However, number sense refers to deep understanding of HOW numbers work. It will take some time for young children to master these skills!

32. Dried Weeds/Cleaning

Lay out your dry weeds on a tray and sanitize them with a Lysol type spray, outside. Leave them outside for a while until the strong smell goes away. How long do you think that will take?

THINK ABOUT IT!

Number Sense - An Overview

Number sense is the critical foundation that ensures children will be successful in mathematics for many years. It lines them up for success in addition, subtraction and other math operations, and includes:

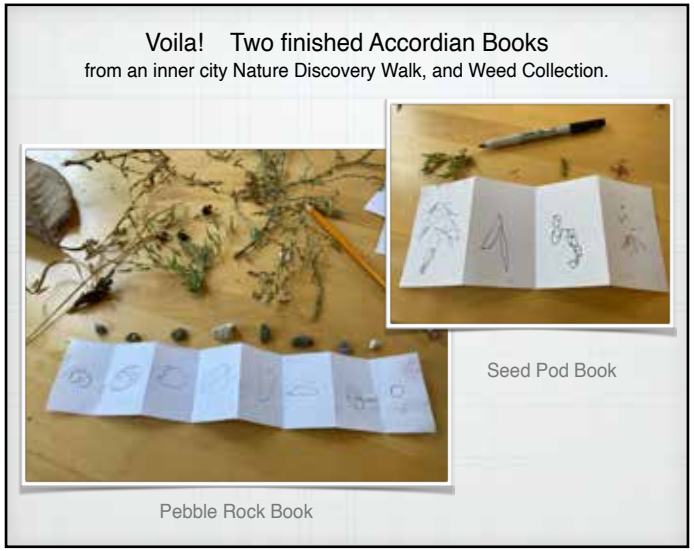
1. Rote Counting (naming numbers in order)
2. Number Recognition (recognizing numbers in print)
3. Counting with One to One Correspondence (each number has a constant value)
4. Comparing Quantities (understanding the concept of more/less/same)
5. Cardinality of Number (recognizing that the last number said when counting is the number of total objects)
6. Conservation of Number (understanding that the number of objects is always the same even when rearranged)
7. Subitizing (the ability to recognize "how many" in a set without counting individually)

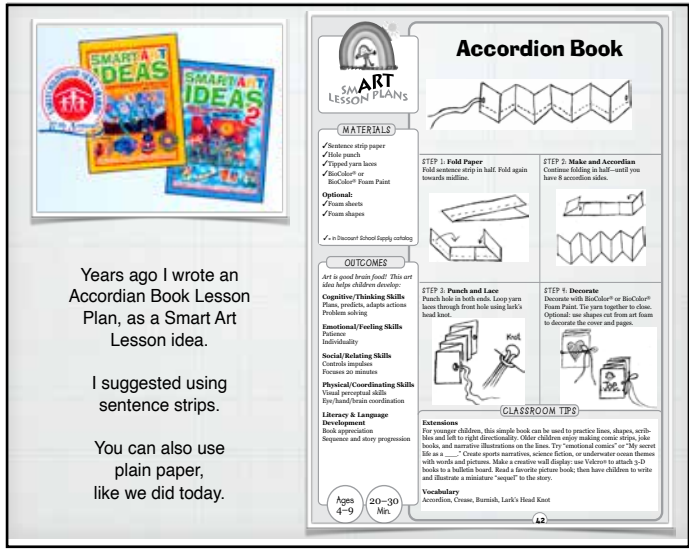
33. Dried Weeds / Observation

Observe specimens and investigate/discuss their attributes.

34. Dried Weeds / Sorting & Classifying

Sort the specimens and group (sort) by categories of your choice. Are any still alive? Do any contain seed pods? Do any have an aroma? How will you sort them?





35. Dried Weeds/Language Development
Think of words to describe each plant specimen's qualities and write those words down.

36. Dried Weeds/Book Making & Documentation
Create accordion books from plain white paper and document your findings.

37. Weed Specimen Book
Observe your plant collection and select your favorites. Using a pencil or black marker, sketch one favorite plant on each page of your book.

38. Pebble Rock Book
Find small pebbles in your neighborhood, just as you found dried weeds. Follow the same process of studying and sorting them, then create a separate Pebble Rock Book.

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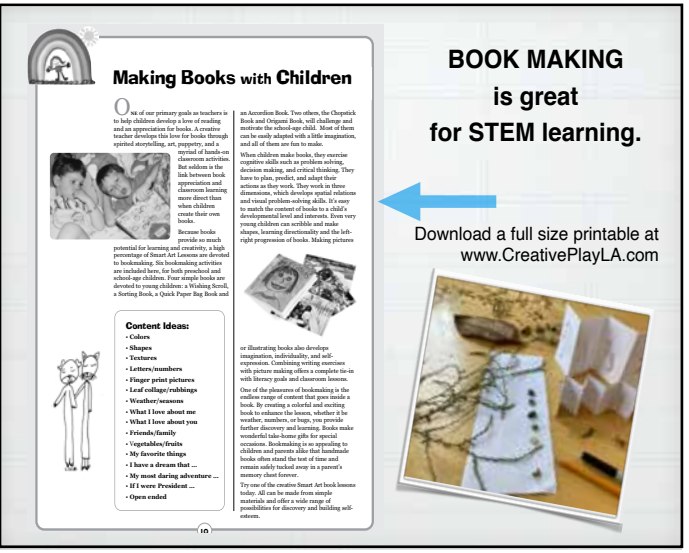
THINK ABOUT IT!
What is Mathematical thinking?
Mathematical thinking begins in the early years with dialogue and real-world exploration It's natural to think that mathematics is primarily about numbers. In school, we first learn how to recite numbers and then spend lots of time writing them down and manipulating them on paper.

Of course, numerals (the written notation for numbers), along with other symbols, are critical for communicating ideas about quantities and expressing how they relate to each other. But what appears to be lost in conversations about school mathematics, however, is that mathematics is **primarily about thinking.**



THINK ABOUT IT!

Mathematical Thinking & Poverty

We now know that if children are not exposed to important mathematical ideas through activity and conversation in the early years, they will lack important foundations for Grade 1 and, most importantly, it will become increasingly difficult for them to catch up to their more equipped peers in school.

This effect is prominent for many children living in poverty who are particularly at risk for early numeracy difficulties. Children often lack key foundational competencies when they enter kindergarten having had little exposure to “math talk” in the home.

THINK ABOUT IT!

10 Tips to Support Children's Science Learning

* Value your child's questions. ...
* Explore and find the answers together. ...
* Give children time and space to explore. ...
* Accept that explorations are often messy. ...
* Learn from mistakes together. ...
* Invite curiosity. ...
* Support further exploration.

Hands-On Art / Workshop Activity - Leaf Attribute Study

36. Leaf Attribute Books

In today’s hands-on art, we made 2 accordion books. We gathered leaves and compared their attributes. We decided to compare them by 1)size and 2)number of veins.

In our 1st book we drew the leaves sequentially from biggest to smallest.

In the 2nd book we drew the leaves sequentially from most veins to least veins. We predicted that the largest leaves would have the most veins. What did we discover from our observations?

Was our prediction or “hypothesis” correct? What did our “scientific process” or investigation conclude?

37. Kindness Rocks
Collect rocks and paint them. Make Kindness Rocks with positive message and spread them out throughout your neighborhood.

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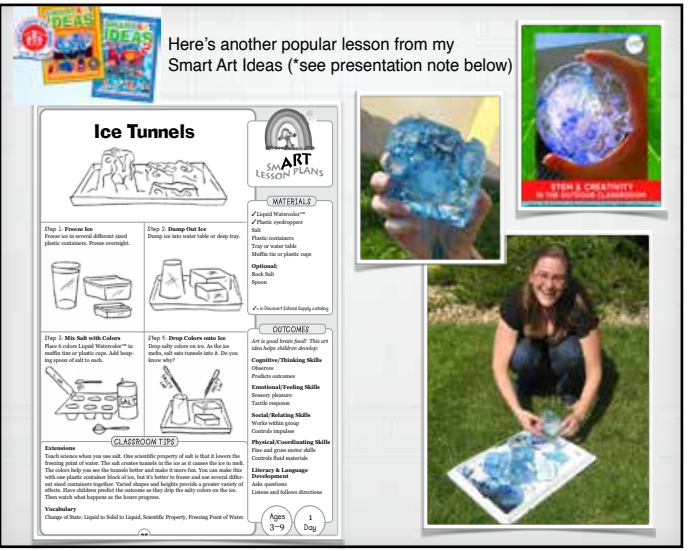
Rock Painting - Recommended Materials
Try either Puffy Paint or Acrylic Paint Pens to make rock painting easy. Or try the traditional approach using a small paint brush and acrylic paint.

THINK ABOUT IT!
Teachers and parents can help children learn to think and solve problems in creative ways by giving them the freedom to make mistakes and by respecting their ideas. To solve a problem creatively, children need to be able to see a variety of perspectives and to generate several solutions.

39. Citrus Fruit & Light
Examine citrus fruit slices using a light table or simply hold slices up to light. Because of its many unique attributes, citrus fruits are especially good for math and science investigations.

40. Citrus Art Prints
with citrus fruit and paint on paper or cloth.

THINK ABOUT IT!
When children focus on problem solving rather than on getting the right answer they learn more.



38. Ice Tunnels with Salt
This is popular on a sunny day outside. Use food coloring if you don't have access to Liquid Watercolor.

*Sadly, my two Award Winning books, Smart Art Idea and Smart Art Ideas 2 are now out of print. They had several re-prints and 10 good years of selling well, but are now retired.

However, I've added many FREE DOWNLOADS of SmartArt lesson plans and articles on my website at www.CreativePlayLA.com or email me if you want me to send you a Lesson Plan or article in particular.
Email: art@annareyner.com

41. Sidewalk Chalk - Body Designs
Create designs that you can lie down onto and make a picture from, like wings or backgrounds. Imagine putting yourself into the picture, then plan and draw it out.

42. Sidewalk Chalk - Stained Glass Geometrics
Use masking tape to section off areas then fill in with chalk. Remove tape when done.

43. Sidewalk Chalk - Word Art.
Create positive messages with words art to spread positive energy.

CONCLUSION: ON CREATIVITY
THE POTENTIAL FOR CREATIVITY the act of making something new - lives in each of us. Most of us act less and less upon this potential as we "grow up" and become adults.

Own own creativity becomes a memory, something we gave up in exchange for conforming to rules and responsibilities. HOWEVER, it's never to late to make your own creativity a priority. Creativity is one of the most important skills we can develop as parents and educators.

After all, if you're reading this you are probably either a teacher or a parent, or both. Your influence on children is enormous, and your own attitude makes all the difference, Thank you for showing up today, and thank you for the important work you do with children.

Book a Hands-On Professional Development Workshop
for your next Staff Development Day!
Lots of topics to choose from.
View Video Clips of Workshops at:
https://www.creativeplayla.com/workshop

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