THE POWER OF ART:

(ideas related to integration of art exploration as an application of mathematical knowledge/concepts)

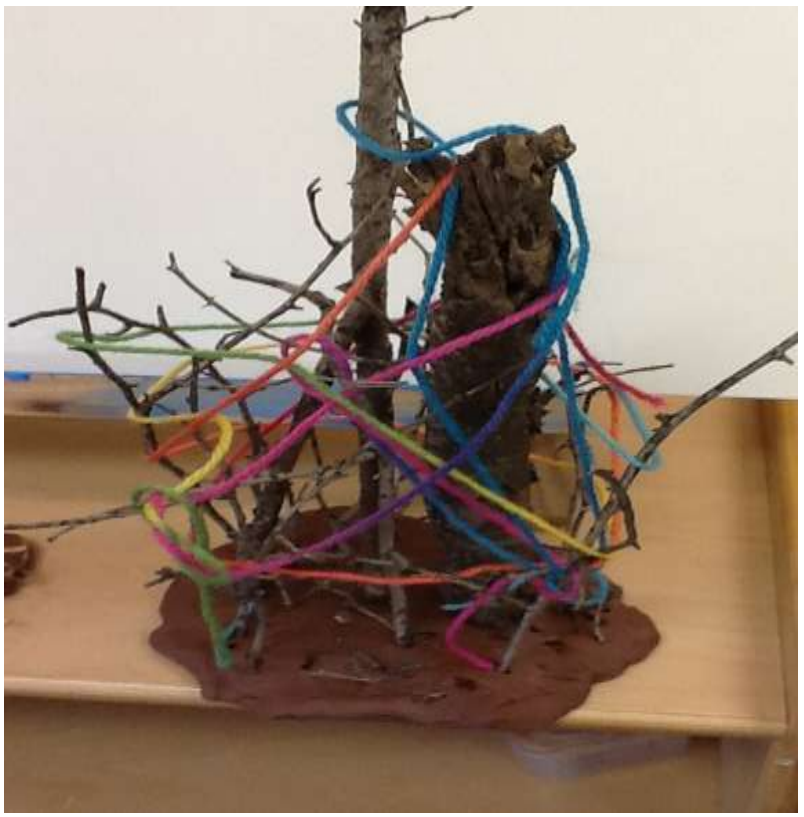
The Power of Art: Part 1 discussed the impact of purposeful teaching and engagement with children during choice time.

However, it is critical that we do not relegate exploration of materials to only free choice centers. Integrating exploration of "art" and/or hands-on materials during all subjects as a way to represent thoughts and ideas is an ideal way to extend children's learning. These experiences provide insights into children's level of understanding and ability to apply the concept.

"Mathematics for young children is much more than rote memorization of counting words or names of shapes. Children of this age are capable of engaging in thoughtful mathematical reasoning and problem-solving. One way to move beyond rote mathematics is to provide children with a variety of engaging, hands-on opportunities to broaden their understanding of math concepts."
- The Albert Shanker Institute
(http://www.shankerinstitute.org/Downloads/Early%20Childhood%2012-11-08.pdf)

"Communicating is considered one of the fundamental processes of mathematics, but it is impossible to do without knowledge of appropriate and sophisticated mathematics language." Children are able to retain and apply this language when reinforced in the context of hands-on explorations. "During this time the teacher intentionally teaches and explains mathematics vocabulary.

Teachers can then encourage the use and practice of this language by asking open-ended questions that allow children to describe their mathematics play." –The Albert Shanker Institute



EXAMPLE:

Geometry: OBJECTIVES:

<u>Common Core K.G.</u>

K.G.2: *Correctly name shapes regardless of their orientations or overall size.*

K.G.3: *Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").*

K.G.4: *Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g. number of sides and vertices/"corners") and other attributes (e.g. having sides of equal length.)*

K.G.5*: Model shapes in the world by building from components (e.g., sticks and clay balls) and drawing shapes.*

K.G.6: *Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full side touching to make a rectangle?"*

<u>GOLD:</u> 21a: *Understands spatial relationships: positional words of location, direction and distance*

21b: *Understands shapes (recognizes basic shapes, describes two- and three-dimensional shapes)*

<u>PreK checklist</u>: *Names basic shapes*
Understands directionality and position of objects
Explains what similar objects have in common

IDEAS OF OPEN-ENDED QUESTIONS:

- What shape is this…
    - How do we know it is (shape)…
    - What are you using that shape to represent..
    - How it is the same/different as a (shape)…
    - What happened when you placed two (shape)s together…
    - What other objects are this same (shape)…
    - What would happen if we placed… (i.e. two triangles next to, beside, on top of, below, etc.)
- What is your favorite part…
- How did you decide to…
- What can you do differently to…
- What shapes could you use to make a… (another shape, an object, etc.)
    - What are some more ways to make a…
- What are some ways that you can form this sculpture into a sphere, a cube…
    - How is your _____ and your friend's _____ the same/different…
    - What are some ways that we can keep the shape but make it bigger, taller, smaller, wider, longer, heavier, etc…
    - What would happen if …
    - Tell me more about…
    - What objects in your house/outside/in the school/ in nature look similar to this…
- What would happen if we turned it upside down… What shapes do you see now…
    - How many of _____ do you have on the top/bottom?
    - How do we know which has more/less…
    - How could you show balance…

Examples of Vocabulary:

(http://www.shankerinstitute.org/Downloads/Early%20Childhood%2012-11-08.pdf)

Names of two- and three-dimensional shapes-

circle *cube*
sphere *rectangle…*

Language to describe shapes:

sides	*lines*	*angles*
round	*straight*	*curved*
perpendicular	*parallel*	*vertical*
horizontal	*coiled*	*semi- or half of…*

Terms to compare quantity:

more than	*less than*	*equal*
half of		

Terms to compare length and weight:

longer *longest*
heavier *heaviest…*

Positional words to describe the location of objects in space:

underneath	*near*	*inside*
far	*next to*	*on top…*

Pictures in this document showcase ways Union Public Schools 3 year old, 4 year old and Kindergarten teachers allow children to use hands-on experiences to represent what they know to enhance, extend and demonstrate their learning in the area of mathematics. These are only a couple of examples as there are a myriad of possibilities. Thank you for sharing.