

SNAP - Scaffolding For Numerical Synapses

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Received March 2023

Accepted for publication March 2023

Published May 2024

Abstract

SNAP-Scaffolding for Numerical Synapses is a curriculum supplement created to nurture wonder and curiosity of the numbers 1-10 for young children and their adults to enjoy. Put into practice it offers even more. SNAP is intrinsically linked with the aims of holistic education and contemplative practices. Originally created with a Montessori environment in mind with access to existing overlapping layers of Practical Life, Sensorial material, Language, Math, Music, Art, History, and Science the scheme fits into learning environments wherever there are children and their adults. Third in the scheme — Observing *Three* in Young Children — is appended for a detailed look. The manuscript begins with an article citation by Ron Miller.

Keywords: *contemplative practices, holistic education, mathematics education, curriculum*

Much more than simply molding young children into future workers or citizens, holistic educators insist that education should be understood as the art of cultivating the moral, emotional, physical, psychological and spiritual dimensions of the developing child. A holistic way of thinking seeks to encompass and integrate multiple layers of meaning and experience rather than defining human possibilities narrowly.

Holistic education is based on the premise that each person finds identity, meaning, and purpose in life through connections to the community, to the natural world, and to spiritual values such as compassion and

peace. Holistic education aims to call forth from people an intrinsic reverence for life and a passionate love of learning. Holistic education nurtures a sense of wonder. There is no one best way to accomplish this goal, there are many paths of learning and the holistic educator values them all; what is appropriate for some children and adults, in some situations, in some historical and social contexts, may not be best for others. The art of holistic education lies in its responsiveness to the diverse learning styles and needs of evolving human beings. By accommodating differences teachers bring out the unique gifts contained within each child's spirit.

By fostering collaboration rather than competition in classrooms, teachers help young people feel connected. By encouraging reflection and questioning rather than passive memorization of “facts,” teachers keep alive the “flame of intelligence.” (Miller, 2000)

Rejoining Ron Miller’s article from the point of “the holistic premise to include the search for spiritual values such as compassion and peace;” today we hear much about adults engaging in various contemplative practices and educators are wanting to share with their students how to be more self-aware, mindful, grateful, and compassionate. They want to show their students how to alleviate anxiety, be aware of their emotions and regulate them, and how to calm and focus their minds.

Originally aired September 23, 2022 on her *Mind & Life* podcast interview of Tish Jennings, Wendy Hasenkamp brings to mind key points regarding contemplative practice in education:

- Contemplative practice can help shift our minds and have critical implications in the world—as to the field of education, specifically, in how the next generation is shaped and held throughout their education.
- Children tune into the adults around them.
- Emotional states are very contagious, especially with children.
- Contemplative practice can help shift automatic stress responses.
- A settled nervous system settles other nervous systems.

- Attunement or harmony and a kind of energetic resonance can happen between people.

Based on her own studies and those of others, Tish Jennings shares her reflections:

So when it comes to these interventions and this research, I think we have to take our time and take it one step at a time... I think we need to understand better how we create interventions that are developmentally appropriate. I think there’s a tendency for us to think, ‘Well, this works for adults. Let’s try to modify it in a way that will be appropriate for students.’ Maybe students really need something completely different.

Tish continues:

Mindfulness doesn’t look the same for a six year-old and a 26 year-old. I think we have a lot to learn about what is actually developing. We don’t know. I know Rob Roeser has called it something like... I think he called it proto-mindfulness. That’s the mindfulness that you see in young children. It’s not the kind of mindfulness we have because there’s not a metacognitive process going on, but they can be very attuned to the present moment. We know that. So how can we help them grow that? And what does it look like at 5, 6, 7, 10, 15, 25? That’s something we need to work on.

“Proto-mindfulness”—the mindfulness that you see in young children. Being witness to moments of a child’s mindfulness is wondrous; they are among those moments you know why it is that you stay in teaching, if you are a teacher. Sometimes these moments are accompanied by

explosive exuberance; sometimes they happen as if in a trance-like reverie.

So how can we help them grow that?

By adding “SNAP-Scaffolding for Numerical Synapses” to my own classroom environments, ages 3-6, my aim was to help nurture more joy in early impressions about numbers. I came to realize that as a classroom practice it offered even more than this. SNAP is intrinsically linked with the aims of holistic education and contemplative practices. It happened coincidentally; while in Montessori teacher-training I was reading Michael S. Schneider’s book, *The Beginner’s Guide to Constructing the Universe*. It delighted me to see numbers in a different way — beyond simple digits to be used for counting and calculation. As I became infused with a sense of wonder and curiosity I envisaged a classroom practice in which I could bring this same appreciation to children. Later my notes were written up and titled, SNAP-Scaffolding for Numerical Synapses. I was aware that oftentimes math educators and parents are concerned with a lack of enthusiasm for mathematics.

The purpose of SNAP is to help adults—at home or in the classroom—to help young children find numbers, related patterns, and geometric shapes in the world all around them. Its aim is to help any teacher, parent, or caregiver wanting to share with their children the ever-present display of numbers. It outlines a purposefully and consciously prepared environment that 1) stimulates the senses 2) allows a child to build on what he or she already knows daily, weekly, monthly, and yearly 3) makes it possible for a child to learn across subject matters, integrating a full, year-long curriculum 4) enables connections—sometimes directly and sometimes

indirectly—and promotes contemplation of interrelated concepts among simple numbers, simple shapes, nature, art, science, and technology. In these ways, SNAP advances knowledge about our brains and how we learn.

Children will notice and connect with the numbers one to ten in ways that develop a sense of wonder, curiosity, and a keen eye for subtle detail. Once they develop a compelling relationship with numbers, more engagement with math and science is credible. Observing numbers and patterns can impart a sense of order and inspire quiet observation and reflection; it can also lead to enthusiasm about the unknown. A sense of mystery is sure to instill a lifelong interest in numbers and propel pursuit of numbers beyond adding, subtracting, multiplying, and dividing. SNAP provides a sound basis for unlimited, far-reaching inquiries into subjects such as geometry, Fibonacci numbers, the Golden Ratio, fractals, and biomimicry to name a few. Besides helping to enliven student learning, SNAP can enhance a teacher’s effectiveness and help them achieve daily, monthly and yearly classroom objectives as they turn to it for mutual confidence and appeal.

The integration of SNAP into all classrooms and childcare environments is intended to run easily and concurrently with previously established procedures. Additional themes work complementarity, running parallel, as well. This guide is organized in a way to be used with children 2-6 years of age, throughout a year. There is proven interest in the material as early as age 2, with fascination spiraling upwards at each successive age level! Continuous threads crisscross life skills, sensorial activities, math, language, and culture, history, art, music, and science. Within each of these categories, exercises are listed

progressively, easiest to more complex. The parent or teacher chooses appropriate exercises and makes adaptations according to their children's skills and interests. Ten sections focus on one number at a time, one to ten, and corresponding geometric shapes over the course of a typical school year.

Using new and preexisting materials at schools and daycare facilities allow for a smoothly adapted focus on any number, one to ten, and its corresponding geometric shape(s). Teachers, parents, and caregivers follow each section, one to ten, as they build onto this nurturing environment for their young children to explore, taking notes as to what really works well for them and their children. Suggestions provided include correlating books to read, music, projects, and cross-cultural and naturally occurring points of interest. Every teacher has their own favorite source of crafts, music, and books. They are invited to choose those that are related to the numbers one to ten and add them to the scheme.

Those features provided by the natural world can, initially, instill the greatest sense of wonder and curiosity. Where possible, sections begin with observing something from nature.

A fundamental understanding of holistic education is that it attends to the body, mind, and spirit of the student. Using SNAP as a guide, fine and gross motor skills are exercised as children trace sandpaper numerals and geometric shapes and as they make the shapes on the floor with their legs. Children practice counting as they explore a basket containing a number of various items. They listen to stories and sing songs connected to a number theme. Spirit is taken up through awareness and contemplative practices. SNAP presents the numbers 1-10 in a different and curious fashion,

inviting children to look at numbers in an unconventional way alongside the more typical. How is it that so many flowers have 5 petals? Why do snowflakes have 6 sides? Is there a reason why the gable roof on the playhouse looks like a triangle? Why do they say that a cat has 9 lives? The exploration and questions are endless and the scheme can stay with one for a lifetime.

A felt sense of wonder, thankfulness, and appreciation for life" is how the renowned psychologist Robert Emmons defines gratitude. "Gratitude enhances our resilience and tends to make us happier and more satisfied with their lives. (Macy & Johnstone, 2012)

Observing *Three* with Young Children

Observing *three* includes exploring geometric expressions of *three*, i.e., triangles; polyhedrons such as a triangular pyramid, a triangular prism, and an icosahedron.

Introductory Activities

1. Have a table with natural and other characteristic objects for children to look at and gently touch. Make a ceremony of the placement of any new object or its picture to help create interest (e.g., ginkgo leaf, *three*-leaf clover, rose thorn, shark tooth).
2. "What do you know about *three*?" (e.g., *three* wheels on a tricycle).
3. Play "Spy with My Little Eye," finding triangular objects throughout the room.
4. Challenge children to make a triangle with their bodies; bending arms at elbow, standing with legs apart, standing

with arms up overhead. Sitting “crisscross-applesauce” suggests a triangle.

5. Have *three* children sit in chairs placed at the vertices of a triangle shape and help them hold a length of yarn to delineate the triangle. Invite other children to lie down on the floor under the triangle and look up at it.

Life Skills

- Sort a collection of triangles according to size or color.
- Thread *three* beads (pink) onto a pipe cleaner or string and fashion into jewelry.
- Stitch around the edges of triangle sewing cards.
- Cut along a triangle path.
- Show how to braid.
- Make a *three*-bean salad with children: kidney, yellow, and green beans.

Sensorial Exploration

- Hang a mobile with triangles from the ceiling.
- Invite finger-tracing of various triangle shapes.
- Place tape to create a triangle on the floor; invite children to various exercises (e.g., walking, sitting). Consider the average length of children’s legs so that *three* can sit here and reform the shape with their legs.
- Draw triangles in a tray of sand or shaving cream.

- “Draw” triangles with your finger in the palm of the child’s hand or on his back.
- Draw triangles in the air using long, broad strokes, with/without ribbons; alternate arms.
- Feel sandpaper triangles and sandpaper numeral *three*; make crayon rubbings.
- Hold triangular pyramids and triangular prisms of various sizes, one at a time, in two hands. (Patterns are available for making polyhedrons from paper or card stock.)
- Explore bubble-making with various open-form polyhedrons: triangular pyramid, a triangular prism, and an icosahedron.
- Explore patterning and tessellating properties of triangles; the equilateral triangles will tessellate, but every other triangle must be rotated 180 degrees.
- Lift a *three*-pound weight.

Math

- Explore a basket containing *three* of various items (e.g., *three* beads, *three* pencils, *three* apples).
- Name items that the child can find and bring to you on a tray (“Please bring me *three*...”).
- Display currency units of choice (e.g. *three* dollars, *three* euros, *three* yen, *three* pesos).
- Count various objects in the room by units of *three* (Use counting and skip counting songs).
- Display and work with units of measure (e.g., *three* ounces, *three* pounds, *three* inches, *three* meters, *three* minutes, *three* hours; show how *three* feet make a yard).

Language

- Read aloud picture books that harmonize with the number *three* theme (e.g., *I Can Spell Words with Three Letters* by Anna Nilsen; *The Three Questions* by Jon J. Muth; *The Greedy Triangle* by Marilyn Burns; *The Three Little Pigs, Three Little Kittens, Goldilocks and the Three Bear*; *The Three Billy Goats Gruff*).
- Invite the child to the nature table and engage the child in conversation about the objects on display; have the child write about the objects (the teacher may write child's words); invite the child to "read" his story to his friends.
- Trace within triangular stencils and around triangular forms (pre-writing skill).
- Trace printed, broken-line triangles off or on writing lines (pre-writing skill); extend into connect-the-*three*-dots activities.
- Pin-punch paper triangles (pre-writing skill).
- Provide materials for children to make little books about *three*. Include pictures (e.g., a cake with *three* candles, a fish tank with *three* fish).
- Explore sign language for *three* and triangle.
- Add relevant words to Word Wall (e.g., *three*, third, triangle); Greek and Latin prefixes (e.g., *tri*—as in triceratops and tricycle); include related pictures of natural and man made constructs.
- Name various triangles and add them to your Word Wall (e.g. equilateral, isosceles, obtuse).
- Add to *three*-part card activities (e.g., equilateral triangle, isosceles triangle).

- Explore phrases (e.g., "*Three* strikes and you're out!" "*Three* cheers!" "*The three Rs*").
- *Three* words to remember if your clothes catch on fire— "*Stop, drop, and roll!*"

Culture

- Spotlight the words for *three* as you learn to count, one to ten, in other languages.
- Look for expressions of *three* on a variety of flags (e.g., French, Italian, Peruvian).
- Share expressions of *three* elsewhere in various cultures.

History and Timelines

- Add to the linear display of calendar months; guide understanding of *three* months.
- Add to the linear display of photographs of a child; add one from his or her *third* birthday—continuing concept of a lifetime.
- Refer to a linear timeline of the ages and find the early civilizations of Egypt, the Americas, and Islam; explore work of the ancient craftsmen who used geometry extensively, both structurally and symbolically; focus on *three* and the geometric expressions of *three*.

Art and Music

- Invite the child to the nature table and engage the child in conversation about the objects on display; have the child draw/map the objects to create a still life.
- Print triangular shapes using various items.
- Paste triangular shapes.
- Stencil triangular shapes.
- Explore what can be created with triangular shapes (e.g., sailboats, puppy dogs, evergreen trees).
- Cut or pin-punch triangular shapes.
- Explore patterning and tessellating properties of triangles; equilateral triangles will tessellate, but every other triangle must be rotated 180 degrees.
- Provide coloring sheets with triangular patterns.
- Marble-roll paint onto paper in a triangular pan or box.
- Look for triangles within selected pieces of art (e.g., *Twittering Machine* by Paul Klee).
- Create triptychs.
- Sing and dance (e.g. “My Hat It Has Three Corner,” “Three Little Kitten,” “3Rs—Reduce, Reuse, Recycle” by Jack Johnson, and add third verse to “The Ants go Marching”).
- Introduce children to the musical instrument, the triangle.
- Introduce a performance by three instrumentalists or singers as a trio.

Science

- Name primary paint colors, i.e., red, blue, and yellow; extend work into color mixing.
- Study the wedge (a simple machine); show how an ax gets splitting power from a triangular shape.
- Look at humankind’s use and responsibility to care for land, water, and air.
- Explain that fire needs oxygen, heat, and fuel.
- Describe the *three* spatial dimensions: length, width, and height (depth).
- Look at the Periodic Table of Elements; *three* is the atomic number of lithium.

Astronomy

- Show the earth, the *third* planet in our solar system.

Botany/Zoology/Human Body

- Display Ponderosa pine needles grouped in clusters of *three* and *three-leaf* shamrocks.
- Show that fish fins have a triangular structure.
- Show that a shark tooth gets its bite from a triangular shape.
- Learn about triceratops – a large dinosaur with three horns on its head.

Additional Activities

1. Have children find an expression of *three* outside (e.g., rocks, *three*-leaf clover).
2. Invite *three* children to sit on the patio and roll a ball to each other; talk about the shape expressed, i.e., a triangle.
3. Make bottle cap sailboats with triangular sails.

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Author Bio

Sheryl Morris is a grandmother and former teacher. Becoming more “spiritual” after having taken Montessori teacher-training in retirement from a chaotic attempt to “find her passion” outside education, she became enthusiastic to learn more about other holistic modes of education. She holds to these words by Ron Miller.

“As a holistic thinker, I am convinced that the whole is greater than the sum of its parts, and that if these various movements and communities would come together, learn from each other, and appreciate each other’s contributions to a movement for educational rights, we would have a political and cultural force that could seriously contest the reign of the educational empire.”

— Ron Miller

Other intersectional interests and concerns of Sheryl’s lie in planetary health and our place in the cosmos, and social justice. Sheryl learns about societal structures and systems which for hundreds of years have supported abuses and domination. She looks for answers about how we might guide children to not become complacent to others’ dreams and well-being as they follow and build on their own.

Sheryl self-published “SNAP-Scaffolding for Numerical Synapses” which can be found at Amazon.

<http://www.snap-scaffoldingfornumericalsynapses.com>