ANGELA RUSS –AYON

MY SHADOW MOVES WITH ME

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STEAM is based on the idea of educating students in five specific disciplines — science, technology, engineering, art, and mathematics, embracing teaching skills and subjects in a way that resembles real life. It's child's play!

We have so many facts at our fingertips on smart phones and computers, that education is no longer about memorizing facts. The process of the scientific method involves hypothesizing, making predictions, thinking logically, experimenting to test the hypothesis, and observing the results. Children need to learn how to explore, evaluate information, integrate, think critically, work together, and problem solve.

Young children are naturally curious, observant, and develop their own understanding of science over time - based on their life experiences. They build upon concepts they already know and have been exposed to, scaffolding from new knowledge gained, and practicing science skills every single day.

GUIDING THE JOURNEY TO DISCOVERY…

- Provide age-appropriate tools for children to use: ruler, scale, magnifying glass, measuring cups, beaker, tweezers, gloves, binoculars, camera, reference books, funnels, sifters, buckets, clear containers for observing, recording implements, thermometer, Petri dish, lab coats, helmets, vests, aprons, etc.
- Encourage children to make discoveries on their own: to predict, to question, to ponder, to use their senses, to experiment over and over again.
- Give children time to process questions you ask and information they uncover. Allow them to come to their own conclusions.
- Describe actions using scientific terms.
- Read stories and display books with pictures that support actions and experiments.
- Sing songs and read books about the subjects.
- Help children make connections to real-life.
- Ask open-ended questions that present an alternative to the actions children take to help them articulate their decision-making process.

PROVIDING INSTRUCTIONAL SUPPORT

Ask open-ended questions, questions that cannot be answered with one word, such as yes, no, 5, or yellow.

- "How did you decide to…?" "Why did you…?"
- "What if you… ?" "Tell me about…?"
- "How else could you…?" "Why do you think…?"
- "How are they alike/different?" "How can you tell…?"
- "What might happen if…?" "How do you/did you…?"

Don't expect to know the answers you will receive, and don't ask questions you already know the answers to. Discover how children arrive at their conclusions by asking for explanations. Begin by praising attempts. Make real-life connections.

- Use whole sentences - not fragments.
- Use a variety of words in simple phrasing.
- Phrase and re-phrase questions until children understand what you are asking.
- Build on what children say by affirming, encouraging, and then fishing with more open-ended questions.

EMBED SCIENTIFIC CONCEPTS throughout each day using terms and expressions that give children more exposure to the language of science. Do your homework. Prepare a word wall, use flash cards, and display signs at science stations.

SCIENCE STATIONS

Set up stations that look nice, are inviting, are organized, and that encourage exploration – not just random things in a basket.

- When appropriate, there should be one of each item that corresponds to the number of children participating. (1-to-1 correspondence.
- Access to tools for drawing and writing: clip board with blank paper, pencils, colored pencils (sorted by color).
- Provide a way for the children to explore: light box, magnifying glass, microscope, Plexiglas jars, graduated sizes, etc.
- Encourage respect for the child's and other people's work.
- Display an open book that presents information about the concept, display, or activity.
- Set up a chalk board or frame with related terms along with a written purpose as a helpful reminder for teachers and aides.
- Follow up with charts, and graphs that show the children's predictions, preferences, and observations.

EXAMPLES OF EARTH SCIENCE

All fields of natural science related to the planet Earth – geography, geology, ecology i.e.:

- Day and night: Moon, night sky, stars, sun, sunrise, sunset. Effects of the sun on different objects and people
- Shadow chasing, measuring, and marking
- Weather: sunny, rain, snow, hail, wind, ice
- Clouds and formations
- Terrain: mountains, valleys, desert, grass, plants, flat lands
- Dirt and soil exploration and discovery: mud, compost, sand, clay
- Solids vs liquids
- Water: oceans, lakes, rivers / flow on ramps, pouring, mixing, condensation, evaporation, freezing
- Changing seasons: temperature changes, cause and effect
- Rocks: sedimentary, metamorphic, igneous
- Observation of rocks: shapes, color, crystals, streaks, hardness, cleavage and cracks, luster
- Colors of the rainbow
- Destructive weather: tornadoes, hurricanes, floods, earthquakes
- Taking care of the Earth: litter, recycling
- Fossils
- Gravity

EXAMPLES OF LIFE SCIENCE - PLANTS AND ANIMALS:

A Natural science - The study of life and organisms; biology, anatomy, medicine, zoology, sociology, anthropology, i.e.:

- Living and non-living things
- The human body
- Health / nutrition / germs / diseases
- Lifecycles of animals, insects, plants
- Parent and baby animals

- Comparing leaves / pinecones / trees / bark / flowers
- Flowers: water, xylem, petals, symmetry, scent, etc.
- Earthworm, meal worm, and other insect observation
- Collecting ants / observing an ant farm
- Collecting caterpillars / observing transformation to butterfly
- Spider webs and ways of hunting
- Fish and sea creature observation
- Characteristics of animals and insects
  - Movement of animals and insects: feet, fins, skin, wings, etc.
  - Animal and insect sounds / habitats / features (hair, fur, feathers, skin, scales, etc.)
  - Location of habitats: underground, in trees, in water, etc.
  - Food sources and hierarchy of animals and insects (survival of the fittest)
  - Sleep and movement patterns: day, no sleep, nocturnal, etc.
  - Survival skills: hiding, camouflage, webs, etc.
- Wild versus tame animals
- Human use of animal and plant products
- Metamorphosis and physical changes over time
- Eggs and birth
- Growing root vegetables in clear glass with water
- Plant a seed or an edible garden
- Examine fruits & veggies: pumpkins, oranges, shucking corn, etc.

EXAMPLES OF LIFE SCIENCE – HUMAN BODY

- Parts of the body
- How body parts are used
- Movement, heart rate, perspiration
- Meditation and mindfulness
- Keeping teeth and gums healthy
- Purpose of doctors and dentists
- Five senses
- Motor skills
- Balance

EXAMPLES OF PHYSICAL SCIENCE

A Natural science – the study of nonliving materials; explains and predicts nature's phenomena - physics, chemistry, astronomy, math & statistics, i.e.:

- Force and motion
- Cause and effect
- Ways to measure time (timer, routine, sundial, clock, hourglass)
- Magnetic attraction (WARNING!)
- Ice freezing and melting
- Sponges and water absorption
- Archways & Bridges
- Sink or float
- Gravity
- Magnification
- Simple machines
  - Lift with a lever
  - Pulley
  - Wedge
  - Wheel and axle
  - Inclined plane / ramp
  - Screws, nuts, bolts
- Light and dark: ways to make light, eyes adjust to the dark, light reflection off mirrors and metal, create shadows, filters, explore different colors of light
- Gravity
- Static electricity
- Battery electricity
- Liquid vs solid
- Classifying / Sorting
- Weight and balance
- Temperature changes

INTERESTING SCIENTIFIC ACTIVITIES:

- Shadow dance
- Trace shadows at different times of the day
- Draw chalk faces and clothing on shadow bodies
- Make shadow puppets / puppet show
- Shine light in flashlight activity books
- Mix colors
- Make sun prints out of regular household items using construction paper, which will fade.
- Use paint swatches to color match to things in nature
- Freeze flowers and leaves in ice
- Press flowers into books / laminate for bookmarks
- Conduct water experiments with oil / powders / paints
- Paint with watercolors and dash with salt
- Drip rubbing alcohol onto Sharpie art
- Eye drop die onto coffee filters
- Salad spin paint
- Sponge paint with various sizes and styles
- Watercolor over a wax or chalk design
- Press paper into liquid watercolor and shaving cream
- Mold clay into layers, like the Earth
- Dig for fossils or buried objects (clues). Make fossil fingerprints.
- Make a rainbow with a glass, mirror, water, and paper
- Make Johnny Cakes with Jiffy Mix - measure, mix, and heat.
- Make a sensory board or bin with misc. objects: buttons, pipe cleaners, foam, fur, sand, beans, seeds, etc.
- Use weekly food ads to make a food pyramid or go on a healthy food hunt
- Make shapes and construct things with straws, blocks, pipe cleaners, Playdoh, blocks, etc.
- Sound-sation: identify different sounds
- Smell spices, fruits, and veggies
- Make a paper plate wind spinner
- Make mud bricks in ice trays
- Blowing and popping bubbles
- Examine a bug in a jar
- Make Playdoh
- Blow and suck with straws
- Scavenger Hunt with clues

INTEGRATING ART:

Combine artistic techniques, visual aesthetics, and literacy skills while being introduced to basic scientific concepts.

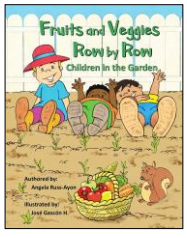
- Experience different methods of art: draw, paint, sketch, sculpt, molds, plaster of Paris, wire, pottery, stamps, papier-mâché, and decoupage.
- Use watercolors, pastels (chalk), acrylics, oil paints, pencil or ink, charcoal, crayons, chalk.
- Work with fingers, brushes, scrapers, felt tips, eye droppers, molds, etc.
- Make 2D and 3D art.
- Sculptures out of miscellaneous objects and recycled material: spools, boxes, toilet and paper towel rolls, paper (construction, newspaper), felt, foam, fabrics, pipe cleaners, buttons, tile pieces, tissue pieces, glue.
- Puppetry

MUSIC REFERENCE LIST:

- ♫ "Follow the Leader" CD: "Smart Moves 3" (Directionality, prepositions, opposites, conceptualization)
- ♫ "I'm Growing" CD: "Smart & Yummy 1" (life cycle of plant)
- ♫ "Firefly" CD: "Bugsters Tunes and Tales" (light/Insect)
- ♫ "Pour, Whip, Chop, Toss " CD: "Smart & Tasty 2" (sequencing)
- ♫ "I Can Blink My Eyes" CD: "Toddler Math, Moves, and Mania"

"Fruits & Veggies Row by Row" ISBN: 978-0-9987090-3-1
(Picture book about planting a garden)

"Chalk It Up!" ISBN 13: 978-0-9799612-9-8
(Resource guide for outdoor chalk activities.)



Thank you for listening, and welcome to the CLUB!