



## **ANGELA RUSS –AYON**

### **MY SHADOW MOVES WITH ME**

AbridgeClub.com  
a Russ InVision site  
P: 562-421-1836

E: [info@abridgeclub.com](mailto:info@abridgeclub.com)  
©2022 All Rights Reserved.

**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: ruler, scale, magnifying glass, measuring cups, beakers, tweezers, gloves, binoculars, cameras, 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 asked 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.
- Encourage children to describe what they are doing and predict what they think will happen.

**ASK OPEN-ENDED QUESTIONS** that present an alternative to the actions children take in their home language. This can help them articulate their decision-making process. Use questions sparingly. Children need time to try new things, solve problems, practice skills, think about what they are doing and learning, and make connections to what they already know. Be patient. One question may be enough.

#### **PROVIDING INSTRUCTIONAL SUPPORT**

Ask open-ended questions, questions that cannot be answered with one word, such as yes, no, 5, or yellow. Keep in mind, they might be answered nonverbally with gestures, pantomimes, facial expressions, the use of props, or movement.

- “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. Discover how children arrive at their conclusions by asking for explanations. Begin at the beginning. Encourage 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, books, and display signs at science stations with related terms and corresponding images that have a written purpose. This helps teachers and aides remember content.

#### **INCORPORATE MOVEMENT**

Children make connections to words, phrases, and sentences by creating physical movements to define them. Help students improve their ability to recall particular words and definitions by teaching vocabulary connected with action.

- Children actively use both the left and right sides of their brains
- It works with both small and large groups
- It sharpens students' listening skills
- Students are not required to speak until they are ready to
- Students become role-models for their peers

#### **SCIENCE STATIONS / DISPLAYS**

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

- Provide access to implements for drawing and writing: clip board with blank paper, pencils, and colored pencils (arranged by type & color).
- Deliberately select inviting, collaborative equipment and open-ended materials that reflect the children's individual interest, skills, needs, cultures, and home languages.
- Provide a way for the children to explore further: light box, magnifying glass, flashlight, microscope, Plexiglas jars, transparent objects and containers, simple machines, etc.
- Display an open book that supports information about the concept, display, or activity. Nonfiction works best.
- Encourage respect for the tools, equipment, objects, child's and other people's work and opinions.
- Connect new information to real life experiences
- Review rules and important information for safety, etc.
- Label items with images and printed names.
- When appropriate, there should be one of each item that corresponds to the number of children participating. (1-to-1).
- Complete charts and graphs to display 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, marking, use to build
- Weather: sunny, rain, snow, hail, wind, ice, shade
- Clouds and formations
- Terrain: mountains, valleys, desert, grass, plants, flat lands
- Dirt and soil exploration and discovery: mud, compost, sand, clay
- Solids vs liquids (sand is a solid)
- 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,, i.e.:

- Living things
- The human body / 5 senses
- 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.
- Animals: wild versus tame / farm / pets
- 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

- How body parts are used
- Movement, heart rate, perspiration
- Meditation and mindfulness
- Keeping teeth and gums healthy
- Purpose of doctors and dentists
- Parts of the body
- 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.:

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

## INTERESTING SCIENTIFIC ACTIVITIES:

- Examine light sources
  - Shadow dance
  - Shine light through transparent, translucent, and opaque objects
  - Trace shadows at different times of the day
  - Measure shadows at different times of the day
  - Identify animals, objects, and people by their shadows
  - Match animals, objects and people to their shadows
  - Draw chalk faces and clothing on shadow bodies
  - Make shadow puppets for a puppet show
  - Retell or make up a story using shadow moves or puppets
  - Illuminate an enclosed box, block structure, or plastic bin
  - Use an overhead projector to shine light through colored transparent blocks onto a sheet (or sun through a window)
  - Mold and reshape foil into bodies, letters, numbers, or shapes for shadow play
  - Make sun prints out of regular household items using construction paper, which will fade
  - Arrange transparent colored objects on a light table.
  - Make a rainbow with a glass, mirror, water, and paper
  - Play games like *Follow the Leader* and *Charades* by observing shadows.
- 
- 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
  - Drip rubbing alcohol onto Sharpie art
  - Eye drop die onto coffee filters
  - 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.
  - Make shapes and construct things with straws, blocks, pipe cleaners, Playdoh/clay, blocks, etc.
  - Sound-sation: identify different sounds
  - Smell real 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* using clues

### **INTEGRATING ART:**

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

- Journal everything
- Experience different methods of art: draw, paint, sketch, sculpt, mold, plaster of Paris, wire, pottery, stamps, papier-mâché, and decoupage.
- Use watercolors, pastels (chalk), acrylics, oil paints, pencil or ink, charcoal, crayons, chalk.
- Mix colors
- Paint with various sizes and styles of brushes and sponges
- Work with fingers, brushes, scrapers, felt tips, eyedroppers, molds, etc.
- Watercolor over a wax or chalk design
- Paint with watercolors and dash with salt
- Press paper into liquid watercolor and shaving cream
- Make 2D and 3D art.
- Sculpture 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

### **LEARNING PATHS:**

Choose preschool science activities that feed into pre-existing "learning paths." Some of which include:

- cause and effect sequences pertaining to everyday objects (i.e. ice melts in the sun, shadows change with the sun)
- structure and function (i.e. the relationship between the shape of an object and its purpose)
- variation and classification—(i.e. objects or living things have distinct properties (light brightens; birds have feathers)
- how nonliving physical things change (i.e. lights turn off, toys break, towers fall)
- how living things grow and change (i.e. babies grow, leaves fall)
- how the insides of a living thing differs from the insides of an inanimate object (i.e. pretend food vs. real food)
- how living things move
- how animals and people think
- visit children's homes and observe family interactions and invite families to actively participate in the classroom
- attend community functions attended by families

### **MUSIC REFERENCE LIST:**

- ♪ "I'm Growing" CD: "Smart & Yummy 1" (life cycle of plant)
- ♪ "Follow the Leader" CD: "Smart Moves 3"  
(Directionality, prepositions, opposites, conceptualization)
- ♪ "Moving Numbers" CD: "Math, Music, and Motion" (Directionality)
- ♪ "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"

***Thank you for listening,  
and welcome to the CLUB!***