

DISCOVERY ZONE: SUMMER

Study Investigation:

Adventures in
STEM

Toddler and Preschool Edition



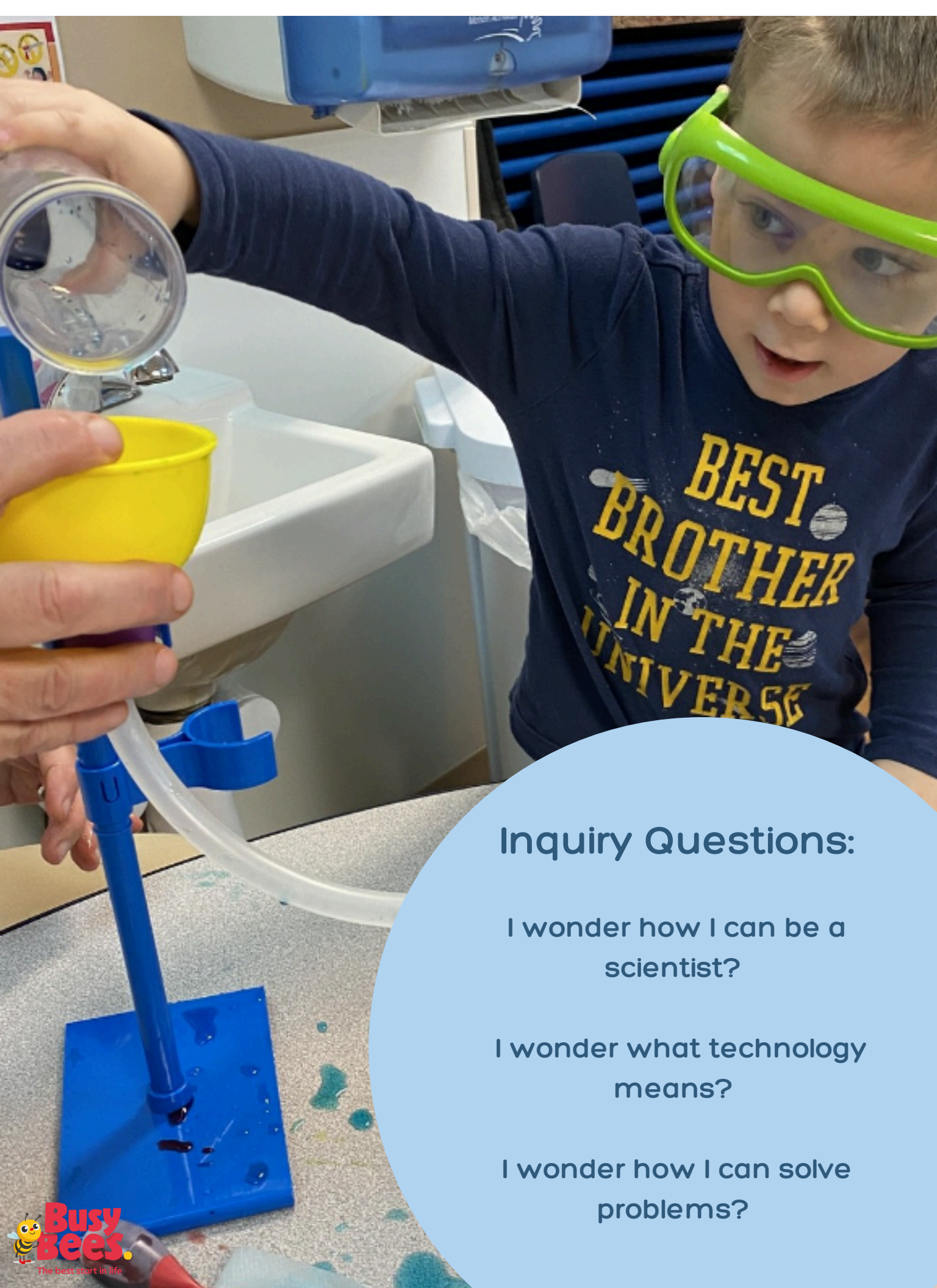
STUDY EXPLANATION

Adventures in STEM



In our current fast paced and technology driven times, we want to provide children with tools to lead them down the path of innovation. STEM activities, featuring science, technology, engineering, and math, help to build critical thinking and creativity, while facilitating curiosity and exploration for becoming the next generation of changemakers! This study topic will inspire children to identify problems and forge solutions, as they get hands on exploring materials, creating tools, making predictions, and testing ideas through experimentation. Children will excite and delight as they make discoveries and innovate!





Inquiry Questions:

I wonder how I can be a scientist?

I wonder what technology means?

I wonder how I can solve problems?

BUILDING CONNECTIONS

Activity One

Title of Activity: Stringing Shapes Together

Skill(s) Focus: Community/Connections/Collaboration/Shape Recognition

Objectives: Children will work together to complete a shape mobile, with each piece individually created by each child.

Materials:

- Cardboard or cardstock shapes
- String
- Drawing materials:
 - Paint, markers, crayons, etc.
- Collage materials
 - Pompoms, stickers, ribbon, googly eyes, pipe cleaners, etc.
 - Large items for toddlers
- Glue/spreaders
- Hole punch

Process:

- Prior to the activity, cut out an assortment of different shapes from cardboard or cardstock paper, enough for each child in the program to have one.
- Present to the children the different shapes, guiding them to identify shapes they see in their environment.
- Set materials thoughtfully on a work surface, and invite children in small groups to engage in the creative activity.
- Invite children to start by painting or marking their shapes in unique designs.
- Next, invite them to glue on collage materials that interest them.
- Once children are content with their shape, support them to hole punch a hole based on how they would like their shape to hang.
- Next, involve children in a discussion around patterning the shapes for display, completing one group's set at a time.
- Continue with the remaining groups so that by the end of the activity, there will be one long collaborative string art project.
- Consider hanging from a fence panel, or wrapping it around a tree in your play yard!

Toddler Variations:

- Present large shapes to toddlers, guiding them to label and point to other, similar shapes.
- In a similar process as above, provide toddlers with paint and stamping tools and invite them to decorate their shapes accordingly.
- When dry, string the shapes together and string in a visible area for toddlers to see but high enough to eliminate any pulling down of it.

BUILDING CONNECTIONS

Activity Two

Title of Activity: What is Missing?

Skill(s) Focus: Collaboration/Connection/Observation Skills/Critical Thinking

Objectives: Children will work in partners to find hidden tools that would be used by a scientist!

Materials:

- Science tools:
 - Magnifying glasses, binoculars, rulers, measuring tapes, colour wands, scales, protective goggles, etc.
- Blanket
- Box
- Dramatic play props:
 - Dress up clothes, signs, books, tuff tray, potion making supplies, etc.

Process:

- Engage children in a discussion about the role of a scientist, asking them to define some of the tasks of that job.
- Prompt them to consider tasks such as observing, predicting, and solving problems.
- Set out all of the tools pertinent to this role, and place on a table, inviting children in small groups to come and explore.
- Display each tool, and invite conversation around what the tool can be used for.
- Next cover the tools with a blanket, and remove one item, placing it in a box below the table.
- Challenge the children to identify which item is missing!
- Keep progressing until all of the tools have been identified successfully, and invite another group to come to the table and play the game.
- When all children have had a turn, set up a "Science Lab" within the dramatic play area, inviting children to participate.

Toddler Variations:

- Implement a similar process with toddlers, carefully introducing each item.
- Educators may wish to use a smaller list of items for toddlers, and may wish to place an item under the blanket for toddlers to feel and guess what it is.
- Set up a dramatic play space in a similar fashion.

BUILDING CONNECTIONS

Activity Three

Title of Activity: Shape Back Doodles

Skill(s) Focus: Collaboration/Fine-motor Skills/Turn-taking/Representation

Objectives: Children will partner together, and take turns drawing shapes onto their partner's backs, challenging their partner to identify them.

Materials:

- Joyful energy
- Shape blocks
- Sensory loose parts:
 - Clean feathers, rock, pine cone, bark, shell
 - Large items for toddlers

Process:

- Engage children in a discussion about the powers of observation. Challenge children to explain how they can observe using each of their senses.
- Guide them to understand that scientists are very strong observers.
- Ask them how they are able to observe something by feeling, using their sense of touch to identify something.
- Invite children to close their eyes, and gently tickle the tops of their hands with each of the props. Invite children to guess what the props are, and to share information about their attributes.
- Next, support children to partner up for this activity, being thoughtful with the selection to ensure more successful interactions.
- Ensure that children who do not want to participate have other activities available.
- Guide one child in each partner set to sit in front of the other. Task the second child with the job of tracing a shape onto their partner's back.
- Set out some of the shape blocks in view of the children for inspiration.
- When they have guessed the shape, they can switch turns.
- Children can switch out partners following the completion of the first cycle.
- Educators can elevate the complexity by changing out shapes to letters or numbers.

Toddler Variations:

- Depending on the age of the toddlers, educators may choose to partner them.
- Alternatively, educators may choose to draw the shapes on the backs of toddlers one by one, guiding them to guess.
- Be sure to use chunkier loose parts for any deeper exploration.

LANGUAGE & LITERACY

Activity One

Title of Activity: Nursery Rhyme Design

Skill(s) Focus: Expressive and Receptive Language Development/Creativity and Critical Thinking/Collaboration/Joyful Engagement

Objectives: Children will engage in critical and creative thinking by working together in small groups to develop actions that mirror traditional nursery rhymes.

Materials:

- Nursery rhymes:
 - Twinkle Twinkle Little Star
 - Old Macdonald had a Farm
 - Hey Diddle Diddle
 - Others!
- Nursery rhyme props:
 - Authentic items
 - Puppets
 - Felt board pieces
- Basket

Process:

- Nursery rhymes are simple poems that make a great first introduction to the genre of poetry. They provide a great opportunity to talk about rhyming words.
- Support children to recite the rhymes with you to get a feel and appreciate the rhythm of different nursery rhymes.
- Seek the children's feedback on ideas for the different actions in the rhymes, inviting them to think critically and creatively. Consider the following prompts:
 - What kind of facial expression should the star show?
 - How can you show us what farm animal you are?
 - How can we pretend to be a cow jumping over the moon?
- Act out the rhymes with your children. Connect the words to the movements and facial expression offered by the children.
- Present to the children a basket of props related to the nursery rhymes of choice, and invite children to explore.
- Support children to form small groups and choose a nursery rhyme to practice together, inviting them to take some props to use.
- Educators may wish to break down the component actions of a nursery rhyme, and assign to individual or paired children to act out. For instance, in the nursery rhyme, "Hey Diddle Diddle, the cat and the fiddle", invite individual children to be each character, mimicking the actions as the nursery rhyme is sung.
- Take photos and videos and be sure to share with families!

Toddler Variations:

- Use felt board pieces to provide toddlers with tangible inspiration.
- Invite toddlers to select from the basket of props and mimic some of the actions as educators articulate them.

LANGUAGE & LITERACY

Activity Two

Title of Activity: Story Book Engineering

Skill(s) Focus: Critical Thinking/Design and Engineering/Creative Expression/
Joyful Engagement

Objectives: Children work together to build and design a wind anemometer,
problem solving engineering steps

Materials:

- Story book: "The Most Magnificent Thing" by Ashley Spires
- Exploration Materials:
 - Construction tools:
 - Hammers, mallets, levels, screwdrivers, etc.
 - Construction loose parts:
 - Nuts, bolts, washers, allen keys, child safe nails, golf tees, etc.
 - Only large items for toddlers
 - Construction base:
 - Cork boards, trivets, cardboard sheet, etc.
- Creative Building Materials:
 - Recyclable loose parts:
 - Plastic containers, buckets, paper towel tubes, fabric scraps, yogurt containers, packaging, cardboard sheets, boxes, etc.
 - Only large parts for toddlers
 - Flexible loose parts:
 - Popsicle sticks, string, ribbon, tree cookies, zip ties, pipe cleaners, etc.
 - Only large parts for toddlers
 - Cardboard sheet
 - Playdough
 - Glue
 - Tape

Process:

- Share the story, "The Most Magnificent Thing" by Ashley Spires, and engage children in a discussion about creative ideas.
- Display the construction materials thoughtfully on a table, and invite children in small groups to explore the construction tools and loose parts.
- Encourage them to practice using some of the tools, using one of the suggested construction bases for practice, helping children to understand what each tool is used for.
- Once children are ready for the creative building portion of the activity, invite them to select a variety of the recyclable and flexible loose parts materials.
- Inform children their challenge is simply to "create something", and let their own imagination take the lead.
- Invite them to connect their pieces together in creative ways, using tape, glue, or connecting loose parts.
- Children may wish to use a cardboard base with a layer of playdough to position their creative build on.
- When complete, invite the children to describe what they have built.
- Display each creation, showcasing the name of the builder and the name of the creation, and invite families to view!

Toddler Variations:

- Provide toddlers with a selection of chunkier, recyclable loose parts, a cardboard base and a playdough chunk, and invite them to explore the pieces and create!

LANGUAGE & LITERACY

Activity Three

Title of Activity: Real-Time Treasure Map Building

Skill(s) Focus: Language Development/Creative Expression/Critical Thinking/ Joyful Engagement

Objectives: Children will take turns marking a treasure map with their foot steps as directed by cue cards.

Materials:

- Treasure chest or suitcase of random treasures:
 - Toys, jewels, props from fairytales, etc.
 - Large items for toddlers
- Butcher paper
- Drawing materials:
 - Pencils, markers, pencil crayons
- Paint/brushes
- Cardstock squares
- Collage materials:
 - Pompoms, buttons, sequins, stickers, etc.
 - Large items for toddlers
- Natural loose parts:
 - Child safe leaves, moss, twigs, flower petals, etc.
 - Large items for toddlers
- Glue/tape

Process:

- Prior to the activity, print a series of arrows on a stack of index cards, showcasing a "left", "right", "up" and "down" movement. Place these cards randomly in a basket.
- Print the numbers "1" through "5" on a stack of index cards. Educators can print out more than one set of these numbers. Place these cards in another basket.
- Engage children in a discussion about treasure maps, asking them to identify what "X marks the spot" means! Tell them they will work together to create a group treasure map!
- Set up a large space in an area of the indoor or outdoor learning environment, and roll out a long sheet of butcher paper.
- Invite children sit around the paper and inform them they will take turns selecting cards from each basket.
- Invite the first child to stand at the end of the butcher paper, and select two cards. That child will move the number of steps detailed by the first card in the direction detailed by the second card.
- Continue the process until all children have had a turn, circling and identifying their steps on the paper.
- The goal is to have a multi-directional treasure map brought to life, with a meandering pathway.
- When the last child has had a turn, be sure to mark an X at the end of the path and set aside a treasure box with small treasures for each of the children.
- Invite children to paint in the marks and use collage materials to decorate their treasure map.

Toddler Variations:

- Tape a long piece of butcher paper in a similar process as above.
- Paint the feet of toddlers lightly, and invite them to decorate their treasure map accordingly.
- Use directions such as "move up", "move down", "move to the side", "move to the back", etc.
- Use chunkier loose parts during any deeper exploration.

MATH DISCOVERY

Activity One

Title of Activity: Measurement Mayhem

Skill(s) Focus: Measurement Skills/Comparison/Collaboration/Joyful Engagement

Objectives: Children will explore basic measurement concepts through a hands on activity.

Materials:

- Various everyday objects of different sizes:
 - Books, toys, stuffed animals, blocks
- Measuring tools:
 - Rulers, tape measures, string, connecting cubes (larger for toddlers)
- Butcher paper
- Tape
- Markers or crayons

Process:

- Engage children in a discussion about measurement, and the different tools that can be used to measure items.
- Explain that height refers to how tall something is and width refers to how wide something is.
- Use Buzz as an example, using a measuring tape to identify his height and his width.
- Lay out a large piece of butcher paper and tape to the floor. Invite children to come and sit around the paper.
- Place various objects nearby, and task children with the challenge of measuring the items.
- Children can be encouraged to use a marker and draw their outlines onto the paper, and then take the measuring tool and identify the height and width measurements from the outlines.
- Children can be supported to print the numbers in the middle of the outline shapes.
- Showcase the comparison measurements, reinforcing concepts like longer, shorter, taller, and smaller.

Toddler Variations:

- Use larger and easily recognizable everyday objects for toddlers, supporting them to draw their outlines onto a sheet of butcher paper.
- Simplify the activity by focusing on basic size comparisons without numerical measurements.
- Engage toddlers in hands-on exploration, allowing them to interact with the objects and tools.

MATH DISCOVERY

Activity Two

Title of Activity: Rainbow Abacus

Skill(s) Focus: Numeration/Critical Thinking/Representation/Joyful Engagement

Materials:

- Authentic abacus
- Multi coloured pipe cleaners
- Multi coloured beads
 - Large items for toddlers (paper beads, larger rings, etc.)
- White modeling clay or play dough
- Prism
- Paper plates
- Dice cubes
- Colander (toddlers)

Process:

- Engage children in a discussion about rainbows.
- Display a prism in a ray of sunshine for children to try to pull out some of the colours of the rainbow.
- Reinforce the colours of the rainbow by singing the traditional rainbow song. Ensure children understand the colours of the rainbow are red, orange, yellow, green, blue, violet, and indigo.
- Discuss what an abacus is and how we can use it to count, showcasing an authentic version and moving one bead over as each unit is counted.
- Inform children they will be creating their own individual abacus, with inspiration from a rainbow!
- Set out the dough, beads, and pipe cleaners thoughtfully on a work surface and invite children in small groups to create.
- Each child will need 7 pipe cleaners in the colour of the rainbow, and an assortment of beads in the same rainbow colours.
- Each child will also need 2 clumps of dough and 2 paper plates.
- Support children to place a knot in one end of their pipe cleaner, and thread on a set of beads in the same colour, and knotting the other end.
- Repeat the process for each colour of the rainbow.
- Support children to divide their dough into two pieces to form a cloud shape on each paper plate.
- Poke each end of the pipe cleaner into each clump of dough, creating an arc.
- When children are finished creating, invite them to take turns rolling the dice, and moving the beads to match the corresponding number.
- Note the violet, indigo and blue pipe cleaners may need to be cut shorter to fit under the other colours.

Toddler Variations:

- Set up an invitation to play using colanders and assorted colour pipe cleaners. Invite toddlers to thread chunkier beads and other ringed loose parts onto the pipe cleaners, counting with the children as developmentally appropriate.

MATH DISCOVERY

Activity Three

Title of Activity: Nature Patterns

Skill(s) Focus: Patterning/Critical Thinking/Creative Expression/Collaboration

Objectives: Children will use loose parts from nature to create an assortment of transient pattern displays.

Materials:

- Posterboard
- Markers
- Paper plates
- Playdough/clay
- Natural loose parts:
 - Child safe flowers, leaves, pebbles, shells, etc.
 - Large items for toddlers
- Flexible loose parts:
 - Buttons, pompoms, jewels, glass beads, etc.
 - Large items for toddlers

Process:

- Prior to the feature activity, print a variety of pattern sequences on a poster board for children to refer to. Patterns to consider: a swirls, repeated dashes, ellipses, zigzags and any others educators desire.
- Set the butcher paper on a table with thoughtfully arranged containers of loose parts and collage materials.
- Invite children to explore the printed patterns and place the loose parts over them.
- As children get comfortable with arranging their loose parts over these patterns, add complexity by asking children to categorize their loose parts according to specific attributes.
- Guide them to explore the following attributes: type of object, size, colour, texture, edges, and curves.
- Challenge children to explore placing their loose parts in a variety of patterns such as AB, ABA, AABB, and AABBA, among others. Invite them to be creative with their patterning alternating the attributes they use as the pattern driver.
- Engage children in conversations about the attribute selected to showcase their patterning.
- When children are content with their patterning on paper, invite them to lay their favourite pattern sequence in a base of clay or playdough on a paper plate for a more permanent display.

Toddler Variations:

- Invite toddlers to explore larger natural loose parts and collage materials and make prints in play dough.
- Identify tangible attributes for children to attend to, such as colours and shapes, elevating vocabulary and understanding.

STEM DISCOVERY

Activity One

Title of Activity: Magnetic Sorting Exploration

Skill(s) Focus: Critical Thinking/Understanding of Magnetic Properties/Joyful Engagement/Appreciation of Scientific Processes

Objectives: Children will explore magnetism through hands-on exploration, promoting curiosity and inquiry about the properties of magnets.

Materials:

- Various magnetic items:
 - Magnetic letters, wand, block, bar or horseshoe magnets, etc.
 - Only large magnets for magnet sheets for toddlers
- Items that attract magnets:
 - Paper clips, iron nails, screws, keys, metal coins, jewelry, etc.
 - Large items for toddlers
- Items that do not attract magnets:
 - Small blocks, Lego, balls, toy animals, etc.
 - Large items for toddlers
- Sensory bins or trays
- Small containers
- White board/marker

Process:

- Place a variety of magnetic tools in a tuff tray, and invite children to explore them in small groups.
- Encourage children to position two magnetic tools together, reversing their placement against each other and observing how one pairing causes the tools to repel and the other pairing to connect.
- Present a collection of magnetic and non-magnetic items to the children, encouraging them to explore.
- Facilitate discussions about what they observe and feel during the exploration.
- Discuss the concept of magnets and their properties.
- Encourage children to explore and sort the items into magnetic and non-magnetic categories into different containers.
- Place a white board for children to view, and create the following columns: Magnetic and Non-Magnetic.
- Guide children to identify which of the materials belong in each column.
- Conclude with a group discussion, encouraging questions and sharing of findings.
- Consider the following variation:
 - Hide magnetic items throughout the learning environment and invite children to use their magnet tools to find them, collecting the magnetic items and returning them to the tuff tray.

Toddler Variations:

- Use larger and easily graspable magnetic items for toddlers.
- Simplify the sorting process by focusing on a few chunky magnetic and non-magnetic items.
- Supervise closely and assist toddlers in exploring the magnetic properties.

STEM DISCOVERY

Activity Two

Title of Activity: Windchime Creations

Skill(s) Focus: Critical thinking/Creative Expression/Joyful Engagement/ Appreciation for Nature

Objectives: Children will exercise their design and engineering skills by creating a unique windchime.

Materials:

- Clean, smooth tin cans with plastic lids (coffee)
- Paint/brushes
- Glue
- String
- Collage materials:
 - Beads, jewels, buttons, sea glass, ribbons, fabric strips, etc.
 - Large items for toddlers
- Natural loose parts
 - Child safe branches, twigs, flowers, tree cookies, shells, etc.
- Metal loose parts:
 - Nuts, bolts, washers, forks, spoons, mason jar rings, etc.
 - Large items for toddlers
- Tape
- Hot glue/gun (educators only)

Process:

- Set out materials thoughtfully on a work surface and invite children in small groups to explore.
- Provide children with a tin can, ensuring the edges are smooth, and invite them to paint the tins.
- Educators may wish to apply a sealant layer of glue for extra durability.
- When dry, children can select a variety of collage and natural loose parts to decorate the outside surface of their tin can windchime bases. Educators can support with hot glue to allow for more durability.
- The next steps involve educator guidance and supervision:
 - Support children to poke holes in the plastic lid of the can.
 - Support children to loop metal loose parts along the length of a few strings, knotting intermittently to space them out.
 - Support children to loop their strings through the holes on the plastic lid and secure onto the can.
 - Additional items can also be tied onto the strings for more design and sound options, such as beads, buttons, and natural loose parts.
 - Glue may be needed additionally to secure these items.
- Hang on a tree branch outside for display and sound enjoyment!

Toddler Variations:

- Source out a large tin can such as a coffee can and use as the base for a group toddler project.
- Ensure smooth edges, and guide toddlers to paint.
- Support toddlers to select chunky metal loose parts, such as mason jar rings, to add to their wind chime, and tie on the pieces.
- Add in fabric strips for added visual appeal.
- When complete, hang in an area for toddlers to hear and see!

STEM DISCOVERY

Activity Three

Title of Activity: Sink or Float Experiment

Skill(s) Focus: Critical Thinking/Scientific Process/Collaboration/Joyful Engagement

Objectives: Children will make predictions regarding whether different items sink or float and understand the concept of density.

Materials:

- Fabric bag
- Various objects of different materials
 - Plastic, wood, metal, etc.
 - Toys, coins, spoon, bark, etc.
 - Large items for toddlers
- Basin or tub/water
- Whiteboard/marker
- Buoyant materials;
 - Aluminum foil, plastic wrap, wax paper, plastic bottles
- Waterproof tape

Process:

- Present the collection of various objects to the children, discussing attribute of weight.
- Discuss the concept of sink or float and ask children to predict whether each item will sink or float.
- Allow children to test their predictions by placing objects in the water and observing the outcome.
- Print two columns on a whiteboard, titled with "sink" or "float" and invite children to document their results in the applicable column.
- Discuss the results as a group, and explain the concept of density. Explain density using a tangible analogy, guiding them to picture a jar packed with sand and a jar packed with cotton balls. The jar with sand is more dense as the materials are crowded together and use up all of the space in the jar. The jar with cotton balls is less dense as cotton balls are more airy and have space in them and around them.
 - Items that float are less dense than the particles that make up water.
 - Items that sink are more dense than the particles that make up water.
- Introduce a final challenge to the children, asking them to convert some of the dense materials that sank into objects that will float.
- Prompt children to experiment with wrapping some of the objects with foil or taping buoyant material to them to increase the volume of the objects without increasing their mass.
- Encourage children to test and adjust their designs, and stay close to support.
- When they have succeeded, discuss the concept of buoyancy and circle back to how buoyant objects are less dense than water and will float. When buoyant objects are adjoined to dense objects, they can support them to float by increasing their volume, the amount of space they take up, without adding to their weight.

Toddler Variations:

- Use larger, easily graspable objects for toddlers.
- Simplify predictions by using visual aids or gestures to indicate sink or float.
- Engage toddlers in hands-on exploration of placing items in the water, focusing on only the outcomes of sinking and floating.

PHYSICAL LITERACY

Activity One

Title of Activity: Move and Groove Obstacle Course

Skill(s) Focus: Engineering/Engagement/Large Motor Skills/Coordination

Objectives: Children will develop an obstacle course, challenging their peers to move through a series of physical challenges.

Materials:

- Assorted physical movement materials:
 - Pool noodles, assorted balls, tires, hula hoops, mats, parachutes, ramps, balance beam, hockey sticks, soccer nets, basketball hoops, target baskets
- Pylons
- Parachutes
 - Any additional items educators may wish to include

Process:

- Engage children in a discussion about the types of movement skills we need to employ in a variety of games. Use the following prompts to list a set of games or activities that use them:
 - Throwing/kicking/hitting a ball
 - Running
 - Jumping
 - Catching
 - Rolling
 - Balancing
 - Reaching
 - Lifting
 - Crawling
 - Etc.
- Document the responses of the children onto a whiteboard.
- Challenge children to select a minimum of 5 different movement skills listed and incorporate them into an obstacle course activities.
- Educators may support children to work in smaller groups and challenge each group to take turns coming up with a series of obstacle course ideas.
- Use the above listed materials, and support the children in setting up the obstacle course in either the gym or outdoors.
- Encourage the children to share their ideas for how to set the course up.
- Time children as they move through the obstacle course, cheering them on to move through it as fast as they can!

Toddler Variations:

- Using some of the materials above, educators can design an obstacle course for toddlers to move through.
- Keep the skills developmentally appropriate, though exciting for toddlers to try!
- Skills such as kicking a ball, crawling through a tunnel, and jumping up to tap something are developmentally engaging for toddlers.

PHYSICAL LITERACY

Activity Two

Title of Activity: Musical Movement Shapes

Skill(s) Focus: Physical Well-being/Fundamental Movement Skills/Shape Recognition/Joyful Engagement

Objectives: Children will dance around the room to music, stopping at shapes and positioning their body to mimic the shape they land on.

Materials:

- Shape markers:
 - Cardboard or laminated construction paper
- Cones
- Music player
- Open space

Process:

- Prior to the activity, cut out a variety of large shapes. Educators may use cardboard laminated construction paper shapes for added durability.
- Set up cones or markers in an open space to define the play area boundaries and place the shape markers throughout the space.
 - Use tape to secure the shape markers to the floor.
- Explain to children their challenge will be to move around the shapes while the music is playing.
- Shout out different movements for the children to attempt based on the music (jumping, rocking, swaying, etc.)
- Educators may change the music tempo to prompt different actions.
 - For example, guide children to dance for upbeat music or tiptoe for slow music.
- When the music stops, the children's task will be to step onto a shape and articulate its name.
- Their additional task will be to position their body to mimic the outline of the shape.
- Play different music tracks with varying tempos and styles.
- Discuss the importance of moving and staying active for physical well-being.

Toddler Variations:

- Use larger floor spaces for easier movement by toddlers.
- Focus on stop and start movements cued by the music being played.
- Simplify the movement expectations for toddlers, focusing on basic actions like marching or swaying.
- Engage toddlers in interactive play by demonstrating movements and encouraging imitation of the shape body positions made by educators.
- Provide soft surfaces or play mats for toddlers to explore movements comfortably.

PHYSICAL LITERACY

Activity Three

Title of Activity: Rainbow Ribbon Dance

Skill(s) Focus: Physical Well-being/Fundamental Movement
Skills/Creative Expression/Joyful Engagement

Objectives: Children will engage in creative physical expression of movement using ribbons and music.

Materials:

- Colourful ribbons
- Mason jar rings
- Open space
- Chiffon scarves (toddlers)

Process:

- Prior to the activity, cut out colourful ribbon lengths for each child. Educators may wish to use mason jar rings and tie an assortment of ribbon lengths onto them.
- Provide each child with a colourful ribbon prop and explain they will be creating a "rainbow dance" using their ribbons.
- Play music with a lively beat to inspire movement.
- Encourage children to move and dance freely, waving and swirling their ribbons.
- Discuss the different ways they can express themselves with the ribbons.
- Optionally, guide children in creating specific movements, such as making circles, waves, or jumps.
- Invite children to form a circle and invite children who would like to showcase their own dance move to the group, encouraging the children to follow suit.
- Allow time for individual and group dancing, celebrating the diversity of movements.

Toddler Variations:

- Use larger ribbons or transparent, chiffon scarves for easier handling by toddlers and fluid movement.
- Simplify dance movements requests, focusing on simple arm and hand motions.
- Engage toddlers in guided movements, encouraging them to follow along with simple dance prompts by the educators.
- Provide support and encouragement for toddlers to explore the space with their ribbons.

CREATIVE DISCOVERY

Activity One

Title of Activity: Pendulum Painting

Skill(s) Focus: Critical Thinking/Exploration/Expression/Engagement

Objectives: Children will access materials in their environment to engineer a pendulum to be used as a swinging painting tool.

Materials:

- Paper cups
- String
- Scissors
- Large roll of paper
- Boxes
- Dowel
- Tape
- Chairs
- Plastic table cover

Process:

- Engage children in a discussion about what a pendulum is and examples of pendulums they may know, such as a swing. Its definition is a weight hung from a fixed point that can swing forward and backward.
- Involve the children with the following steps:
 - Prepare the work space by spreading a large plastic table cover on the floor to catch any spills..
 - Guide children to build a pendulum support structure by securing a dowel between two chairs, supervised closely by an educator for safety.
 - Poke a hole in the bottoms of paper cups and 2 holes on the sides of the cup close to the lip. Prepare approximately 3-5 cups in advance, each to house a different colour of paint.
 - Select one cup and thread string through the holes on its side and hang from the broom. Only one cup at a time should be used to ensure proper management of the space.
 - Place a piece of tape at the outside bottom of each cup and add a dollop of paint and water mixture to the cup. The mixture should be runny enough to fluidly dispense from the cup onto the paper.
 - Roll out a large paper beneath this makeshift pendulum.
 - As a final step, remove the tape covering the bottom hole and begin swinging the cup.
- Encourage children to notice the splatter patterns resulting on the paper, and guide them to note how different speeds of swinging changes the splatter effect.
- Children can repeat this process by changing the paint colour or by adding paint to the single swinging pendulum.
- Educators can discuss with children the patterns created, the different design effects when the cup swings fast, slow, side to side or in a circular motion.

Toddler Variations:

- Create individual pendulums ahead of time for use with toddlers by tying a string onto single paper cups.
- One by one, support toddlers to stand in an open area on a long sheet of butcher paper and place a small amount of watered down paint into their cup, and remove the tape on the bottom.
- Invite toddlers to gently swing their pendulum while maintaining vigilant supervision, and observe their painted creations.

CREATIVE DISCOVERY

Activity Two

Title of Activity: Friendship Bridge Engineering

Skill(s) Focus: Collaboration/Creative Expression/Critical Thinking/Joyful Engagement

Objectives: Children will work in partners to construct a bridge out of loose parts.

Materials:

- Construction loose parts:
 - Craft sticks, twigs, tree cookies, lightweight stones, jewels, gems
 - Large items for toddlers
- Small cups/containers
- Lightweight objects:
 - Toys, stuffed animals, etc.
- Glue/tape
- String/yarn
- Soft building blocks/small cardboard boxes (toddlers)
- Chunky markers (toddlers)

Process:

- Support children to partner up, organizing children into positive groupings for successful outcomes.
- Introduce the concept of building a Friendship Bridge, informing children their challenge is to design a bridge that will hold an item of their choice.
- This item should be a coveted item agreed upon by both partners, such as a favourite toy or stuffed animal mascot.
- Set out a variety of construction loose parts and invite children to explore.
- Guide children to use the cups or containers as the bases for each side of the bridge, using the loose parts for the bridge platform.
- Support children to use glue or tape accordingly to ensure the bridge is secure.
- Encourage partners to discuss and plan their bridge designs, emphasizing the importance of communication and collaboration.
- As partners construct their bridges, facilitate discussions on problem-solving and adjustments to improve stability.
- Test each Friendship Bridge by placing lightweight objects on top and evaluate their success, finalizing with the placement of their selected item.
- Conclude with a group reflection on the engineering process and the importance of working together.

Toddler Variations:

- Place soft building blocks in an open play area, ensuring a safe environment.
- Support toddlers to layer blocks on top of each other.
- Consider using cardboard boxes, invite toddlers to design with markers.
- Introduce a soft plush toy as a topper for their stacked towers for added fun.
- Play soft music during the activity to create a lively and enjoyable atmosphere.
- Foster collaboration by encouraging toddlers to share blocks or build towers together.

CREATIVE DISCOVERY

Activity Three

Title of Activity: Evaporation Art

Skill(s) Focus: Creative Expression/Critical Thinking/Scientific Process/Joyful Engagement

Objectives: Children will create an art piece while considering the process of absorption, capillary action and evaporation.

Materials:

- Trays with rim:
 - Tinfoil trays, baking sheets, etc.
- Jars
- Eye droppers/pipettes/turkey basters
- Water
- Food colouring
- Cardstock paper
- Butcher paper (toddlers)

Process:

- Set out materials thoughtfully on a work surface to promote curiosity, and invite children in small groups to come and explore.
- Include a variety of jars with diluted coloured water, and enough eye droppers and trays for each child.
- Guide children to first place their cardstock on a tray to maintain cleanliness.
- Next, guide children to use their droppers or pipettes to collect coloured water and slowly drip onto the paper.
- Engage children in discussion about what they observe, asking the following questions:
 - How does the colour spread over the paper?
 - What happens when you use different colours?
 - Do the colours mix or stay separate?
 - Is there a difference in the colour pattern when you drop the water from up high or closer to the paper?
 - How quickly do you think the paper will dry?
- Guide children to understand the processes of absorption as they observe the paper swell with the coloured water.
- Guide children to understand the process of capillary action as they observe coloured water spread.
- Guide children to understand the process of evaporation as the water may disappear.
- Place cardstock creations in an area to dry, and display for families when complete!

Toddler Variations:

- Educators may choose to use one large piece of butcher paper for toddlers, placed in a tuff tray.
- Provide toddlers with turkey basters to explore the process.

Educator Reflections: *optional*

I wonder if I successfully observed, listened and allowed the interests of the children to lead further investigations?

I wonder how I could improve upon my teaching practices in the future?

I wonder what support I may need to better foster child inquiry in my learning environment?

I wonder what went well, and what could be improved upon regarding child-led learning?

Investigation Materials

Building Connections

- Cardboard/cardstock
- String
- Drawing materials:
 - Paint, markers, crayons, etc.
- Collage materials:
 - Pompoms, stickers, ribbon, googly eyes, pipe cleaners, (larger items for toddlers)
- Glue/spreaders
- Hole punch
- Science tools:
 - Magnifying glasses, binoculars, rulers, measuring tapes, magnetic wands, scales, (larger items for toddlers)
- Blanket
- Box
- Science dramatic play props:
 - Dress up clothes, signs, books, tuff tray, potion making, tools, etc.
- Shape blocks
- Sensory loose parts:
 - Feathers, rocks, pine cones, bark, shells, (larger items for toddlers)

Language and Literacy

- Nursery rhymes books/pictures/felt boards
- Nursery rhymes props:
 - Authentic items, puppets, clipart, etc.
- Story book: "The Most Magnificent Thing"
- Construction tools:
 - Hammers, mallets, levels, screwdrivers, etc.
- Construction loose parts:
 - Nuts, bolts, washers, allen keys, child safe nails, (larger items for toddlers)
- Construction base:
 - Cork boards, trivets, cardboard sheets
- Recyclable loose parts:
 - Plastic containers, buckets, paper towel tubes, fabric scraps, yogurt cups, packaging, cardboard sheets, boxes, etc.
- Flexible loose parts:
 - Popsicle sticks, string, ribbon, tree cookies, zip ties, pipe cleaners, (larger items for toddlers)
- Cardboard sheet
- Playdough
- Glue/tape
- Drawing materials:
 - Paint, markers, crayons, etc.

Language and Literacy Continued

- Treasure chest/basket
- Selection of treasures/small toys
- Butcher paper
- Paint/brushes
- Collage materials:
 - Pompoms, buttons, sequins, stickers, (larger items for toddlers)
- Natural loose parts:
 - Child safe lower petals, leaves, moss, twigs, (larger items for toddlers)

Math Discovery

- Assortment of everyday objects:
 - Books, toys, stuffed animals, blocks
- Measuring tools:
 - Rulers, tape measures, string, connecting cubes, (larger items for toddlers)
- Butcher paper
- Tape
- Markers/crayons
- Authentic abacus
- Multi coloured pipe cleaners
- Multi coloured beads (larger items for toddlers)
- White clay/playdough
- Prism
- Paper plates/cardboard bases
- Dice (larger for toddlers)
- Colander
- Posterboard
- Collage materials:
 - Pompoms, buttons, sequins, jewels, (larger items for toddlers)
- Natural loose parts:
 - Child safe flower petals, leaves, moss, twigs, (larger items for toddlers)

STEM Discovery

- Magnetic items:
 - Letters, wands, blocks, bar, horseshoe magnets, (larger items for toddlers)
- Items that attract magnets:
 - Paper clips, iron nails, screws, keys, metal coins, jewelry (larger items for toddlers)
- Items that do not attract magnets:
 - Blocks, Lego, balls, toy animals, etc.
- Sensory bin/tray
- Small containers
- Whiteboard/marker
- Clean, smooth tin cans with plastic lids (coffee)

Investigation Materials

Stem Discovery Continued

- Paint
- Brushes
- Glue
- String
- Collage materials:
 - Beads, jewels, buttons, sea glass, ribbons, fabric strips, (larger items for toddlers)
- Natural loose parts
 - Child safe branches, twigs, flowers, tree cookies, shells, (larger items for toddlers)
- Metal loose parts:
 - Nuts, bolts, washers, forks, spoons, (larger items for toddlers).
- Tape
- Hot glue/gun (educators)
- Fabric bag
- Various objects of different materials
 - Plastic, wood, metal, etc.
 - Small toys, coins, spoon, bark (larger items for toddlers)
- Basin or tub
- Whiteboard/marker
- Buoyant materials;
 - Aluminum foil, plastic wrap, wax paper,, plastic bottles
- Waterproof tape

Physical Literacy

- Physical movement loose parts:
 - Pool noodles, balance beams, balls, hockey sticks, basketball hoops, target baskets, etc.
- Pylons
- Parachutes
- Shape markers:
 - Cardboard or laminated shapes
- Music player
- Colourful ribbons
- Mason jar rings
- Chiffon scarves

Creative Discovery

- Paper cups
- String
- Scissors
- Butcher paper
- Boxes
- Broom stick/handle/dowel
- Tape

Creative Discovery Continued

- Paper cups
- String
- Scissors
- Butcher paper
- Boxes
- Broom stick/handle/dowel
- Tape
- Chairs
- Plastic table cover
- Construction loose parts:
 - Craft sticks, twigs, tree cookies, stones, jewels, gems, (larger items for toddlers)
- Small cups/containers
- Glue/tape
- String/yarn
- Soft building blocks/cardboard boxes
- Stickers/decorative tape
- Trays with rim
 - Baking sheets, tinfoil trays, etc.
- Jars
- Eye droppers/pipettes/turkey basters
- Cardstock paper
- Butcher paper
- Water