Ready-Made Curriculum: Things That Roll

Introduction: Things That Roll

In this investigation, children explore the fascinating world of motion by examining objects that roll. From balls and wheels to ramps and friction, children test, compare, and reflect on what makes something roll—and why. They'll design, create, and engineer their own rolling objects and build an understanding of the physical world through observation, prediction, and repeated hands-on exploration.

This unit is not designed to be rushed. Children benefit from a slow, steady pace with many opportunities to return to familiar experiences. Concepts such as slope, speed, and force are best understood through active play, pattern recognition, and problem-solving over time. Teachers are encouraged to revisit favorite activities and remain flexible to extend a week or pause where deep engagement occurs.

The activities and suggestions included are not directives, but invitations—ways to meet all learners without pressure or expectation. Avoid directing or redirecting. Trust in each child's natural drive to explore, and allow learning to unfold with authenticity and joy.

This guide includes daily prompts, journal ideas, suggested vocabulary, recommended books, and ways to incorporate the unit into centers. Use what fits, adjust what's needed, and let the children lead the way.

Books Used Throughout the Unit:

- Things That Go by Byron Barton
- Motion: Push and Pull, Fast and Slow by Darlene R. Stille
- Roll, Slope, Slide: A Book About Ramps by Michael Dahl
- Go, Go, Go! Stop! by Charise Mericle Harper
- Move It! Motion, Forces & You by Adrienne Mason

Vocabulary

Roll, spin, ball, round, shape, push, pull, force, smooth, bumpy, ramp, slope, fast, slow, friction, surface, incline, angle, obstacle, test, design, invent, speed, motion, distance, bounce, predict, experiment, gravity, momentum, direction, rotate, collision, impact, travel, steady, balance, curve

Week 1: What Makes Something Roll?

Focus Concept: Children explore what makes something roll by testing, comparing, and discussing different shapes and surfaces.

Weekly Objective: This week lays the foundation by helping children observe and classify rolling objects. Through hands-on testing, sorting, and discussion, they begin to define what a "ball" is, why things roll, and how shape and surface matter.

Monday – What Rolls? What Doesn't?

Morning Meeting

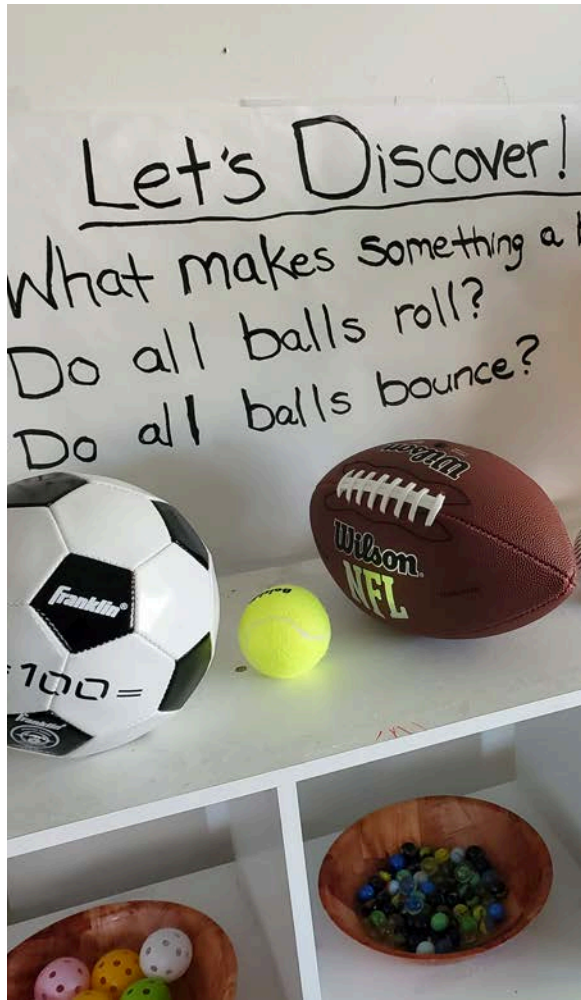
- Read Aloud: Things That Go by Byron Barton
- Discussion Prompts:
  - "What does it mean to roll?"
  - "What are some things you've seen rolling in real life?"
- Introduce the Wonder Wall: Start a Wonder Wall for questions and predictions.

Follow-Up Investigation

- Rolling Test & Sort: What Moves and What Stops?
- Present a table of mixed items: toy cars, tennis balls, square blocks, pinecones, wooden discs, rocks, lids, etc.
  - Create two group areas labeled "Rolls" & "Does Not Roll." Encourage predictions before testing & reflections after.
- Journal Prompt: Draw two objects: one that rolls/one that doesn't.

Closing Circle

- Children share something that surprised them (add to Wonder Wall).



Tuesday – What Makes Something a Ball?

Morning Meeting

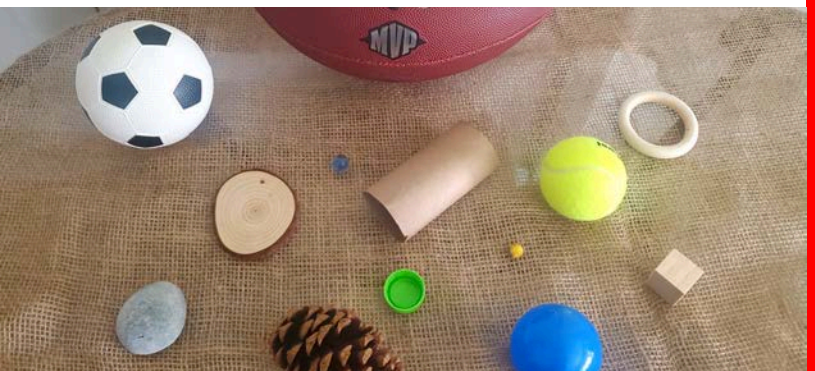
- Read Aloud: Motion: Push and Pull, Fast and Slow by Darlene R. Stille
- Discussion Prompts:
  - "What is a ball?"
  - "Is everything that rolls a ball?"

Follow-Up Investigation

- Ball Sort & Compare: Offer a variety of objects (e.g., ping pong balls, rubber bouncy balls, foam spheres, marbles, eggs, domes, ovals, cubes).
- Children sort into categories: "Is this a ball? Why or why not?"
- Optional journal prompt: draw your favorite ball from today?

Closing Circle

- Add to Wonder Wall: What else do we want to know about balls?



Wednesday – Can You Make a Ball?

Morning Meeting

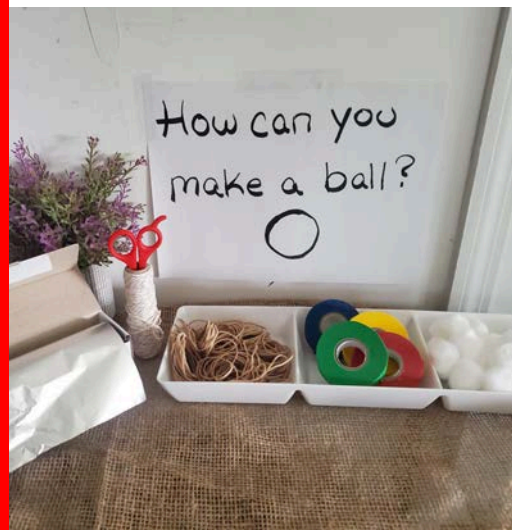
- Read Aloud: Things That Go
- Discussion Prompts:
  - "If we didn't have a ball, could we make one?"
  - "What would it need to look like?"

Follow-Up Investigation

- Build Your Own Ball: Offer trays of foil, paper, string, fabric scraps, rubber bands, corks, and tape. Children design and shape their own balls. Test for rollability and reflect on which materials were most successful.
- Optional Journal Prompt
  - Draw the ball you made.
  - Write or dictate: "I used ___ and ___ to make it."

Closing Circle

  - Reflect: "What did you use to make your ball? Did it roll like you expected?"



Thursday – DIY Bowling

Morning Meeting

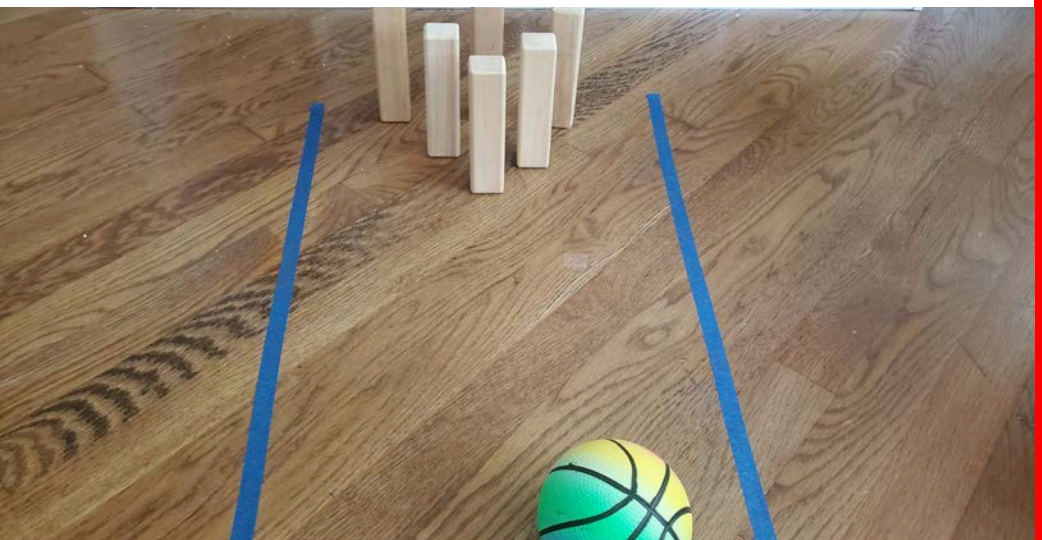
- Read Aloud: Motion: Push and Pull
- Discussion Prompts:
  - "What happens when you push something hard?"
  - "What do you think would knock over blocks or bottles?"

Follow-Up Investigation

- Design Your Own Bowling Lane: Using cardboard, blocks, tubes, and recyclables.
- Provide balls of varying size and weight. Children test which balls knock things over most effectively and how lane structure changes the outcome.
- Optional Journal Prompt: Draw your bowling game.

Closing Circle

- Reflect: "What helped the ball knock things down?"



Friday – Clay Ball Studio

Morning Meeting

- Read Aloud: Roll, Slope, Slide by Michael Dahl
- Discussion Prompts:
  - "How do we shape something into a ball?"
  - What helps it roll better?"

Follow-Up Investigation

- Clay Ball Creation and Testing: Invite children to sculpt balls from clay or dough. Compare how their clay ball moves next to other balls from the week. Discuss roundness and weight.
- Journal Prompt: Draw your clay ball and how it moved.

Closing Circle

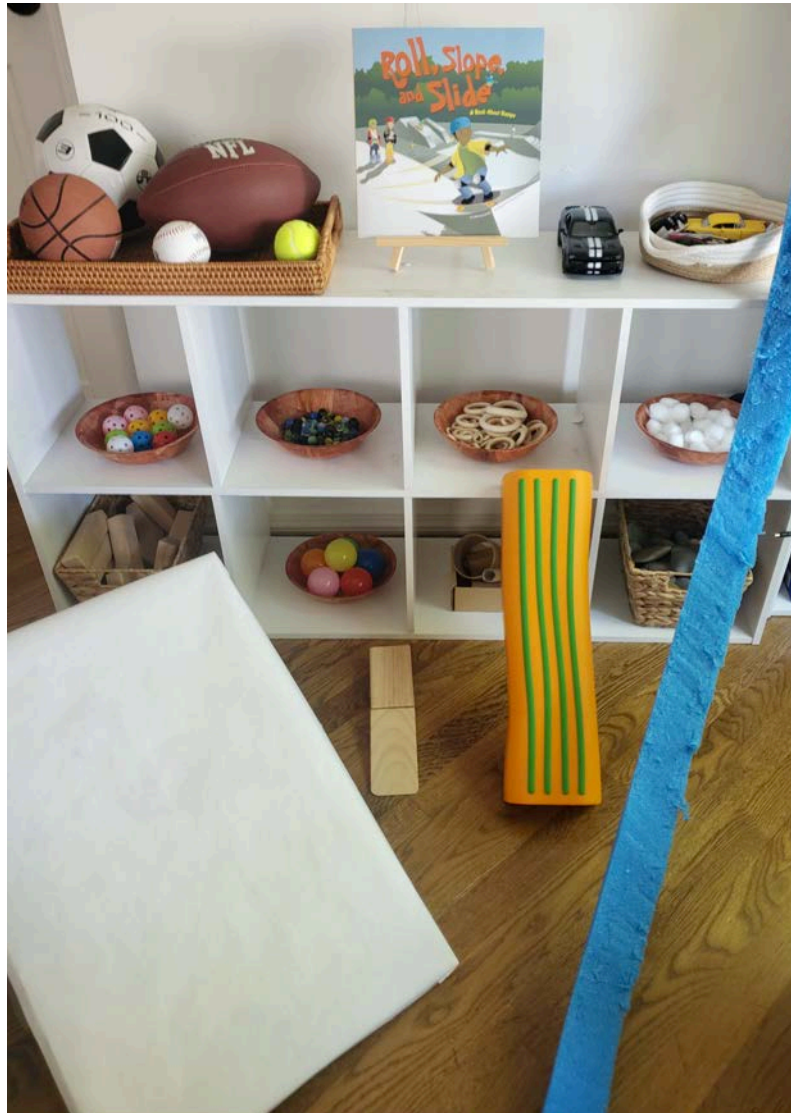
- Reflect: "What did your clay ball do that surprised you?"

Week 2: Exploring Ramps and Surfaces

Focus Concept: Children investigate how ramps and surfaces affect the movement of rolling objects.

Weekly Objective: To understand how incline, texture, and force impact the speed and movement of objects that roll, through hands-on ramp exploration and testing.

Monday – Ramp Explorers



Morning Meeting

- Read Aloud: Roll, Slope, Slide by Michael Dahl
- Discussion Prompts:
  - "What is a ramp?"
  - "Where have you seen ramps before?"
  - "Why might we use a ramp instead of a flat surface?"

Follow-Up Investigation

- Ramp Building & Testing: Children build ramps using boards, trays, cardboard, or wooden planks. Provide a selection of balls and objects (wooden beads, cars, blocks) to test down each ramp.
  - Children observe and compare: What rolls farther? What rolls faster?
- Optional Journal Prompt: Draw your ramp and one object that rolled on it.

Closing Circle

- Reflect: "What did you notice when the ramp was higher or lower?" Add new vocabulary: ramp, slope, height, angle, speed, distance

Tuesday – What Rolls Best Where?

Morning Meeting

- Read Aloud: Motion: Push and Pull
- Discussion Prompts:
  - "Do you think the floor or surface affects how something rolls?"

Follow-Up Investigation

- Surface Testing with Ramps: Set up ramps covered in different materials: cardboard, sandpaper, bubble wrap, foil, fabric, etc.
  - Children test rolling the same ball or object down each ramp. Which goes fastest? Which gets stuck? Chart or graph results as a group.
- Journal Prompt: Draw one of the ramps and describe what happened.

Closing Circle

- Reflect: "Which surface surprised you most?

Wednesday – Predict & Compare

Morning Meeting

- Read Aloud: Things That Go by Byron Barton (revisit with attention to surface types: roads, hills, etc.)
- Discussion Prompts:
  - "If we change one thing on the ramp, what else might change?"
  - "Can you predict what will happen before you test it?"

Follow-Up Investigation

- Ramp Predictions Lab
  - Invite children to choose a ramp and surface combo, and make a prediction: "Will it go fast or slow? Far or short?" Offer clipboards for sketching. Children test their predictions and reflect on outcomes.
- Journal Prompt
  - Draw the ramp and object you tested.
  - Write or dictate: "I predicted ___, and it really ___."

Closing Circle

- Reflect: "Were your predictions correct?"
- Add vocabulary: predict, compare, result, observation, record

Thursday – Paint, Ramps, & Motion

Morning Meeting

- Read Aloud: Push and Pull
- Discussion Prompts:
  - "What will happen if we add paint to the ball?"
  - "How could we use motion to make art?"

Follow-Up Investigation

- Ramp Rolling Art: Use trays or ramps lined with paper. Provide washable paint and balls (golf balls, marbles, rubber balls).
  - Children dip balls into paint and roll them down ramps to create patterns.
  - Offer multiple colors and tools to support experimenting with motion and direction.

Closing Circle

- Reflect: "How did the ball's path change the painting?"

Friday – Ramps in Real Life

Morning Meeting

- Read Aloud: Watch short real-life video clips of ramps in construction sites, airports, or mail sorting centers (project or describe aloud if video not available).
- Discussion Prompts:
  - "Where do we use ramps in the real world?"
  - "How do ramps help people or objects?"

Follow-Up Investigation

- Ramp Design Studio: Invite children to create their own useful ramps.
  - Encourage imaginative or real-world ideas—ramps for animals, ramps to deliver packages, ramps for toy cars. Provide blocks, tubes, cardboard, and boxes.
- You may go on a neighborhood walk and look for real ramps (optional)
- Journal Prompt
  - Draw your ramp and what it's for.
- Write or dictate: "My ramp helps ___ get to ___."

Closing Circle

- Reflect: "Where else have you seen ramps?"

Week 3: Designing with Balls: Games, Mazes, & Movement

Focus Concept: Children apply their understanding of motion by designing games, obstacle courses, and artistic experiences using balls and ramps.

Weekly Objective: To foster creativity, problem-solving, and spatial reasoning through child-designed structures and collaborative movement-based play with rolling objects.

Monday – DIY Marble Races

Morning Meeting

- Read Aloud: Roll, Slope, Slide by Michael Dahl
- Discussion Prompts:
  - "Have you ever tried to guide something through a path?"
  - "What would make a ball go the way you want it to?"

Follow-Up Investigation

- Build a Maze: Children use recycled materials (e.g., paper plates, cardboard lids, straws, tape, pipe cleaners) to create handheld mazes for marbles. Encourage use of barriers, turns, and open space. Provide time for testing and modifying designs.
- Journal Prompt
  - Draw your marble maze.

Closing Circle

- Reflect: "What helped your marble stay in the path? What made it hard?"

Tuesday –Rolling Games: Create Your Own

Morning Meeting

- Read Aloud: Move It! Motion, Forces and You by Adrienne Mason
- Discussion Prompts:
  - "What kind of games would you make? How would you play it? What are the rules of your game?"

Follow-Up Investigation

- Invent a Ball Game: Set up an open space with ramps, boxes, blocks, cones, tubes, baskets, and balls.
  - Children work individually or in small groups to design their own rolling games. Encourage them to explain the rules and try each other's setups.
- Journal Prompt: Draw or describe your game.

Closing Circle

- Reflect: "How did your game work? What would you change next time?"

Wednesday – Collaborative Marble Run

Morning Meeting

- Read Aloud: Things That Go by Byron Barton (revisit with attention to surface types: roads, hills, etc.)
- Discussion Prompts:
  - "Can you predict what will happen before you test it?"

Follow-Up Investigation

- Ramp Predictions Lab
  - Invite children to choose a ramp and/or surface combo, and make a prediction: "Will it go fast or slow? Far or short?"
  - Optional: Offer clipboards for sketching. Children test their predictions and reflect on outcomes.
- Journal Prompt
  - Draw the ramp and object you tested.
  - Write or dictate: "I predicted ___, and it really ___."

Closing Circle

- Reflect: "Were your predictions correct?"

Thursday – Rolling Sculpture with Loose Parts

Morning Meeting

- Read Aloud: The Shape of Things by Dayle Ann Dodds
- Discussion Prompts:
  - "How can we use ramps and balls to create something new?"
  - "What will you try to build today?"

Follow-Up Investigation

- Loose Parts Rolling Installation: Set up a provocation with tubes, ramps, cardboard, mesh, funnels, netting, tape, trays, & varied balls.
  - Children create freeform structures that support movement. Focus on shape, flow, and rhythm of the rolling—not on rules or outcomes.
- Journal Prompt
  - Draw your rolling sculpture.

Closing Circle

- Reflect: "How was this different from the marble run or ball games?"

Friday – Marble Painting

Morning Meeting

- Read Aloud: Move It! Motion, Forces and You by Adrienne Mason (revisit – focus on force and direction)
- Discussion Prompts:
  - "What shapes do you see in your painting today?"
  - "What will you try to show with the way your ball moves?"

Follow-Up Investigation

- Marble Painting Art Studio: Set up trays with paper, paint, and balls/marbles. Children dip the balls into paint and roll across the paper using ramps, tilting trays, or hands. Offer color mixing options and encourage layering.

Closing Circle

- Reflect: "What did the movement show in your painting?"

Week 4: Ramps, Friction, and Design Challenges

Focus Concept: Children extend their understanding of rolling through invention and experimentation, revisiting what they've learned in deeper, more intentional ways.

Weekly Objective: To apply knowledge of motion, friction, and design through open-ended building, collaborative problem-solving, and thoughtful reflection.

Monday – Invent Your Own Roller

Morning Meeting

- Book: Things That Go by Byron Barton
- Discussion Prompts:
  - "What kind of object could you invent that rolls?"
  - "What parts will it need?"

Follow-Up Investigation

- Invention Studio: Children use recycled materials and loose parts (bottle caps, dowels, cardboard, lids) to build a rolling invention.
  - Sketching and testing are encouraged. Think: vehicles, creatures, or abstract sculptures.
- Journal Prompt
  - Draw your invention.
  - Write or dictate: "It rolls because ___."

Closing Circle

- "What worked better than you expected?"

Tuesday – The Delivery Challenge

Morning Meeting

- Book: Motion: Push and Pull, Fast and Slow by Darlene R. Stille (revisit – scientific focus)
- Discussion Prompts:
  - "What kinds of pushes make things roll faster?"
  - "How can we test the speed of different objects?"

Follow-Up Investigation

- Which Rolls Farther? Set up a ramp and use various balls (tennis ball, rubber ball, wooden ball, foil ball, clay ball).
  - Let children test, observe, and document which rolls the farthest and why.

Closing Circle

- **"What surprised you today about speed or distance?"**

Wednesday – Invent a Rolling Creature or Machine

Morning Meeting

- Book: Move It! Motion, Forces & You by Adrienne Mason
- Discussion Prompts:
  - "What kind of creature or machine could we invent?"

Follow-Up Investigation

- Rolling Creature Invention: Offer recycled materials, small wheels, dowels, and loose parts. Children sketch and build their own rolling creatures or machines, then test how they move.
- Journal Prompt
  - Draw your rolling invention.
  - Write or dictate: "It rolls because ___."

Closing Circle

- "What did you have to figure out while building?"

Thursday – Invent a Rolling Game

Morning Meeting

- Book: Go, Go, Go! Stop! by Charise Mericle Harper (revisit – playful tone)
- Discussion Prompts:
  - "Can you think of a fun game that uses rolling?"
  - "What are the rules of your game?"

Follow-Up Investigation

- Design Your Own Game: Children create a simple rolling game with loose parts, ramps, paint, targets, or structures.
  - Games can be individual or collaborative. Offer optional sign-making or score tracking.
- Journal Prompt
  - Draw your rolling game.
  - Write or dictate: "You win when ___."

Closing Circle

- **"**What do games need to be fair and fun?"

Friday – Showcase & Reflection

Morning Meeting

- Book: Roll, Slope, Slide by Michael Dahl (final revisit – wrap-up lens)
- Discussion Prompts:
  - "What do you remember from all the weeks we've explored rolling?"
  - "What was your favorite moment or discovery?"

Follow-Up Investigation

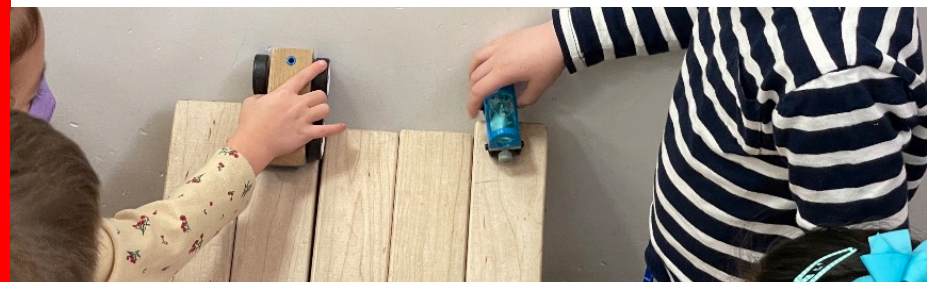
- Rolling Showcase Day: Invite children to choose their favorite invention, game, or design to share with peers.
- Prepare signs or photo displays. Reflect on growth by revisiting the Wonder Wall and vocabulary.

Journal Prompt

- Draw your favorite rolling memory.
- Write or dictate: "I loved ___ because ___."

Closing Circle

- Celebrate each child's voice. Ask: "What do you still wonder about rolling?"



About Centers, Provocations, and Materials

The following center setups and materials are designed to support the investigation across the unit. The intention is not to do everything at once—but to select, rotate, and adapt based on the children's interests, developmental needs, and the rhythm of the group.

These ideas should be seen as options to choose from, not a checklist to complete. Overloading the space with too many choices can overwhelm young children. Instead, offer a small number of materials at a time, and observe how children engage with them before introducing more.

You might choose to:

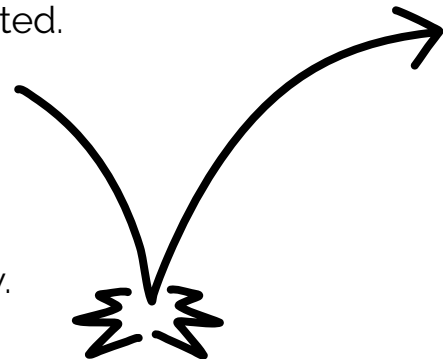
- Keep certain materials consistent for multiple weeks to allow for repetition and mastery.
- Rotate in new elements slowly to spark renewed interest or deeper thinking.
- Modify invitations to become more complex or more accessible as needed.

Children should be welcomed to:

- Make choices about how and where they work within the classroom.
- Move materials between areas (when appropriate) to support their ideas or projects.
- Combine materials across centers to create more layered and meaningful representations.
- Take responsibility for the tools they use by helping to return them when finished.

While autonomy is encouraged, a sense of shared care and responsibility is expected.
In all cases, the role of the adult is to:

- Observe how materials are used and what thinking is emerging.
- Document children's approaches, choices, and discoveries.
- Decide when to step back, when to scaffold, and when to offer something new.



Science & Discovery Center

Purpose: Support experimentation, observation, and critical thinking about motion, speed, weight, and surface.

Materials & Setup Options:

- **Ramp Test Zone:** Set up ramps of varying inclines and surfaces (wood, bubble wrap, foil, felt). Include different objects (balls, cars, blocks) to compare speed and friction.
- **What Rolls? Station:** Offer mixed items (marbles, corks, pinecones, cotton balls, cubes) with trays and clipboards to test and sort.
- **Ball Dissection:** Cut open old or broken balls (e.g., tennis ball, rubber ball) to inspect materials inside. Add magnifying glasses and labeled diagrams.
- **Rolling Maze Challenge:** Create enclosed paths with blocks or cardboard for children to roll balls through. Encourage modification and problem-solving.

Notes: Add vocabulary cards (friction, roll, force, incline, speed, direction, obstacle) and clipboards for drawing, tallying or graphing.

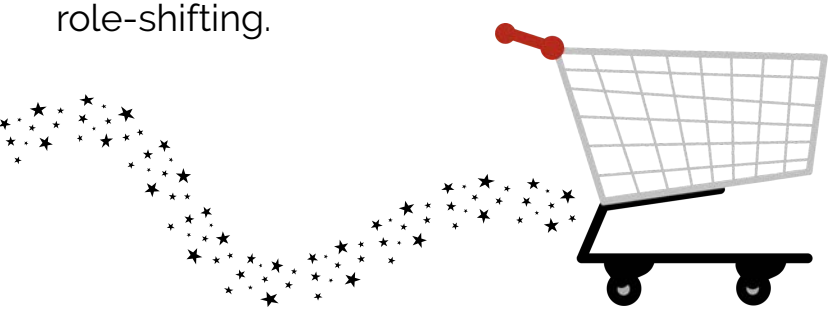
Dramatic Play

Purpose: Support role-play, storytelling, and imaginative extensions of the rolling theme.

Materials & Setup Options:

- **Rolling Repair Shop:** Add tools, tires, bike parts, toy cars, checklists, and repair signs for a pretend mechanic station.
- **Rolling Café Cart:** Create a snack cart on wheels using trays, kitchen props, menus, and aprons.
- **Rolling Creature Vet Clinic:** Stuffed animals with bandages, x-rays, and rolling "stretchers" for transport.
- **Construction Site:** Add vests, cones, blueprints, rolling carts, and hard hats.

Notes: Children are free to combine materials across themes or repurpose props. This center often supports spontaneous role-shifting.



Sensory Table

Purpose: Promote open-ended exploration of movement, sound, and touch through rolling materials.

Materials & Setup Options:

- **Rolling Bin:** Bin filled with kinetic sand, tubes, balls, rolling pins, or spools to explore pressure and movement.
- **Loose Parts Rolling Play:** Bottle caps, corks, small logs, washers, pebbles, lids, and dowels for free exploration and stacking.
- **Tactile Trail:** Create a ramp with sections of different textures (felt, bubble wrap, foil) and test how objects roll across.
- **Make-Your-Own Ball Station:** Foil, yarn, tape, and soft modeling dough for creating rollable shapes.

Notes: Take your time moving through sensory bin bases, as children need time and repetition of experiences. You can also alternate bases in addition to/instead of kinetic sand, e.g. water, water beads, soil.

Blocks & Construction

Purpose: Encourage engineering, spatial reasoning, and design thinking through ramps, movement, and rolling structures.

Materials & Setup Options:

- **Ramp Builders:** Offer wood planks, cardboard tubes, flexible gutters, and clip-on stands or crates to support incline experimentation.
- **Rolling Track Design:** Use masking tape, foam tiles, and wooden rails to build long tracks on the floor.
- **Obstacle Course Creations:** Challenge children to create paths for rolling balls with turns, tunnels, and barriers.
- **Rolling World Builders:** Tape real images of vehicles, roads, bridges, and marine life onto blocks to inspire storytelling and thematic builds.

Notes: Offer both large-scale (floor) and tabletop building areas. Label baskets with types of rolling objects (cars, balls, logs, disks).

Art Studio

Purpose: Offer opportunities to represent rolling, motion, and ball shapes through color, line, form, and texture.

Materials & Setup Options:

- **Marble Painting:** Shallow trays with paper, paint, and marbles. Children tilt trays to roll paint-covered marbles across.
- **Rolling Stamp Patterns:** Toy cars, balls, or objects with textures dipped in paint. Roll or stamp across long paper scrolls.
- **Clay Ball Sculptures:** Provide modeling clay, wooden dowels, and beads to shape and decorate balls or wheels.
- **Blueprints & Diagrams:** Invite children to draw a plan for a rolling invention (with rulers, stencils, clipboards, and graph paper).

Notes: Include a display shelf for creations and in-progress projects.

Literacy Center

Purpose: Support authentic writing, drawing, and storytelling inspired by children's investigations.

Materials & Setup Options:

- **Rolling Stories:** Photos of classroom rolling play and ramps, blank booklets, story strips, and prompts like “I noticed...,” “My ball went...,” or “I invented a...”
- **Design & Plan Area:** Clipboards with graph paper, rulers, pencils, and sticky notes for sketching and labeling ramp designs, games, or inventions.
- **Vocabulary Basket:** Word cards and real photos (e.g., wheels, ramps, balls) with terms like bounce, curve, spin, slope, speed, tilt. Children may trace, copy, or use them in their work.

Notes: Writing tools can move freely across the room—children may write or draw wherever inspiration strikes. Display children’s documentation and sketches as evolving evidence of learning.

"A change in motion is proportional to the motive force impressed and takes place along the straight line in which that force is impressed."

— Isaac Newton