Research shows that well-designed pathways promote physical activity, play and learning by providing children and teachers access to the outdoor learning environment (OLE), where children can go on journeys through the landscape, exploring along the way. Once established, a circulation hierarchy of three types of pathways (primary, secondary and tertiary) will make the pathway system more interesting and easier to navigate.

**Getting Started**
Research demonstrates that pathways can be designed to afford active play and exploration. Consider how children move through the OLE. How will they use wheeled toys? Curvy pathways combined with shrubby adjacent landscaping will stimulate excitement, exploration, chase games, and higher levels of healthy physical activity.

**Primary Pathways**
Primary pathways are a functional necessity in outdoor learning environments and should be designed to provide easy, attractive circulation, connecting classrooms to high-use settings. Primary pathways provide spatial structure to simplify navigation for children and allow teachers to move quickly through the OLE when necessary. They serve as accessible routes to all areas of the outdoor learning environment. Primary pathways can be constructed of concrete (Figure 1), fine crushed stone or hardwood mulch.

**Primary pathways should be:**
- Loopled. No dead ends.
- Curvy. Avoid sharp corners, straightaways, and bottlenecks. Gently curving forms integrated with adjacent plantings and other play settings provide an interesting experience and stimulate exploration.
- Connected to and centered on entrances and exits.
- Linked to primary play and learning settings and important landmarks.
- Wide enough to accommodate intense pedestrian and wheeled-toy traffic, helping children stay on the pathway and pass each other without conflict. Preschool primary pathways should be a minimum of 5 feet wide, with a preferred width of 6 feet. Infant and toddler primary pathways can be narrower (4 feet minimum), because the children are smaller and do not move through the environment as quickly as preschoolers. Note, pathways are more than circulation areas, they are play settings in their own right (Figure 2).
- Located to allow sufficient room for settings and plantings on inside and outside edges of the pathway.
  - Offset from sand play, walls, ball courts, and fences.
  - Provide a 3 ft. minimum planted buffer between pathways and very active settings such as ball courts, as well as immovable objects such as fences, trees and walls.
  - Provide buffers between hard surface pathways and sand play to avoid sand spilling out to create slippery surfaces.
  - Smooth and flat. Longitudinal slopes should be gentle to accommodate the safe use of wheeled toys. In extremely flat areas provide positive drainage.

![Figure 1 - Two children ride tricycles on a concrete primary pathway.](image)
Secondary Pathways
Secondary pathways should provide less direct routes, connecting the primary pathway to more intimate play and learning settings, and affording a variety of play, such as hiding and chasing games. Secondary pathways allow children to interact with the natural landscape and make discoveries. They can take many forms, with widths as narrow as thirty inches. Surfacing materials include hardwood mulch, fine crushed stone, and stepping stones.

Tertiary Pathways
Tertiary pathways branch off primary or secondary pathways and allow children to take short journeys into intimate landscape settings. They can be as narrow as eighteen inches and surfaced with hardwood mulch, fine crushed stone, stepping stones (Figure 3) or tree cookies.

Pathway surfacing material choices

Poured-in-place rubber surfacing.
This is the best practice recommendation for primary toddler pathways where children will be learning to walk (12mo - 24mo) (Figure 4). Poured-in-place rubber surfacing is installed over concrete by trained specialists. As it is a costly material, life cycle costs may be needed.

Concrete.
This is the best practice recommendation for primary preschool pathways because they are more stable, and require less maintenance. However, concrete is more expensive than other options. Concrete can be treated with stain or integrated color to improve attractiveness and helps it blend into the surroundings (Figure 5).

Asphalt.
This material can be used for primary or secondary pathways. Asphalt pathways are less expensive than concrete pathways and require less maintenance. However, they are still more expensive than fine crushed stone or mulch pathways.

Fine crushed stone.
This material can be used for primary, secondary or tertiary pathways. If installed properly, this material can be an accessible surface. Many varieties of fine crushed stone are available since the material is generally mined from local sources. In order to provide a smooth, flat surface a fine material must be used in conjunction with a coarse layer of gravel underneath. This surface is not as hard as concrete, but will gradually become more compact and harder with use. Fine crushed stone pathways are less stable than concrete and require some maintenance but may be less expensive than concrete pathways, depending on geographic location.

Triple-shredded hardwood mulch.
This material can be used for primary, secondary or tertiary pathways. Mulch is the least expensive initial investment, but it breaks down over time and must be replenished. Mulch is not considered an accessible material and not recommended for creating wheeled toy, accessible pathways.

Stepping stones/flagstones.
Can be used for secondary or tertiary pathways. Using natural stone provides a richness and special quality that lends a sense of discovering the natural world (Figure 5).
Pathway Edging
Edging is recommended for fine crushed stone or mulch to help establish and maintain a distinct pathway edge. Edging helps keep the pathway material on the pathway and adjacent materials off the pathway.

Potential edging materials include:
- stones/rocks
- logs or stumps (laid vertically or horizontally) (Figure 6)
- bricks or paver stones
- metal edging (Figure 7)
- tires (laid vertically or horizontally) (Figure 8)
- tire planters (Figure 9)
- landscape timbers (Figure 10)
- treated, redwood or cedar lumber edging secured with stakes or pegs
- railing or plant protection fencing (Figure 11)

Quantity of pathway material
Follow these steps to calculate quantity of pathway material needed.

1. Linear feet of pathway x width in ft. x depth in ft. = cubic feet of material
2. Cubic feet of material/27 = cubic yards of material

Example:
- 200 linear feet of pathway x 5 feet wide x .5 feet deep = 500 cubic feet
- 500 cubic feet/27 = 18.5 cubic yards of pathway material needed
Designing Pathways: Promoting physical activity, providing access January 2012
Preventing Obesity by Design (POD) supported by the BlueCross BlueShield of North Carolina Foundation

The purpose of the Natural Learning Initiative is to promote the importance of the natural environment in the daily experience of all children, through environmental design, action research, education, and dissemination of information.

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