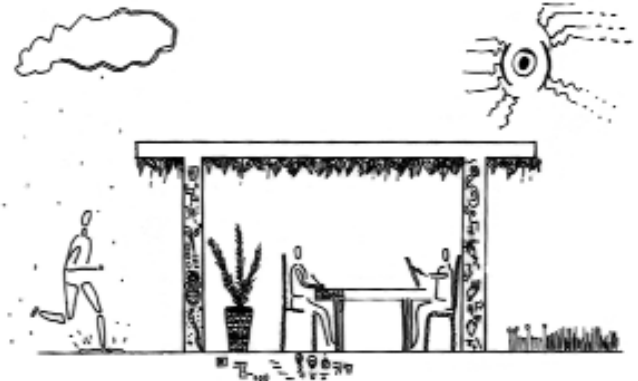




Shade SHelters

With the growing concern about the harmful effects of the sun's rays, the need to provide shade on school grounds is at the forefront for designing safe, interactive play environments. Shade is most commonly provided by large shade trees. But for many schools, the reality of having large shade trees is twenty or thirty years away. Built structures, both permanent and temporary, will help you prepare for present and plan for future shade requirements.



Design details

Tips for Designing Shade Shelters on Your School Grounds

- Consider the purpose for your shelter. Is it to provide protection from just the sun or from the wind and rain as well? Each may require a different solution (e.g. a solid roof and full or partial walls for rain protection, a slatted roof or pergola with plants for sun) or one structure that satisfies all the requirements.
- Consider the location. Study your school grounds to determine where the sun is for most of the day and where shelter is most needed. Consider areas beside the school where students may wait or gather before and after school, and the school grounds where they spend recess and lunch.
- Consider adding elements to existing structures to provide shade and shelter (e.g. an awning or pergola off of a school or portable wall).
- Design your shelter for multiple functions — as outdoor classrooms, social gathering space, areas for reading and writing or quiet reflection.
- Identify ways you can incorporate other elements for play or learning into your structures (e.g. wind chimes, a solar panel or wall paintings).
- Take into account water run-off from roofed structures to avoid problems later. This could be a great spot to include a water barrel to collect rain for watering your gardens.
- Make sure the structures are accessible by everyone at the school. This may involve building pathways or locating at least one structure closer to the school. Shade shelters closer to the school will be easier for teachers to use with their classes.

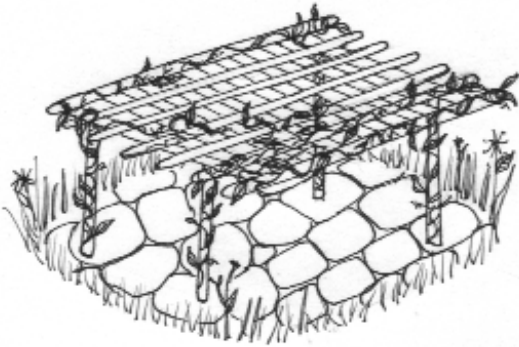
did you know...

Children are at the greatest risk from the damaging effects of the sun's ultraviolet radiation (UVR) since most of their lifetime exposure to solar UVR happens before their eighteenth birthday. The peak sun hours of 10 a.m. to 3 p.m. fall within the normal school day, putting children at an even greater risk while they are outside at recess, lunch and during physical education or other outdoor classes. Due to this increased exposure, it is estimated that one in seven children will get skin cancer in his or her lifetime.



1

Permanent Structures



Pergolas

Pergolas can be used as an entrance to a garden or school building, as shelter over a path, or as shelter in the school grounds where children can sit and play.

- Build from either wood, bamboo, metal, woven willow or trellis frames.
- Create straight passageways or build a number of passageways to create tunnels for play.
- Use vines to cover the pergola frame and provide seasonal shade cover.

Gazebos and Pavilions

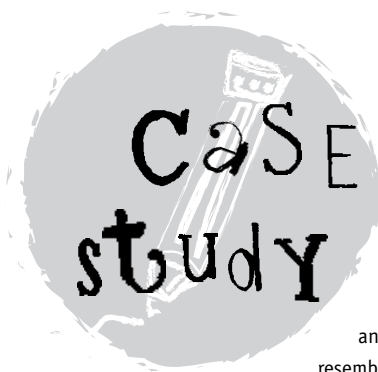
Gazebos and pavilions can be built in a variety of shapes and sizes (e.g. hexagonal, rectangular, square, octagonal), accommodating different class sizes and numbers of students. They can have open walls and roofs where vines can be trained to grow, or they can be fully enclosed. Include a floor or have the structure cover a grass or wood chip area, depending on your budget and how you plan to use the space. Building a gazebo or pavilion can also become a great exercise for math classes to measure the angles associated with the chosen shape. Whichever style and size you choose, follow these basic design standards for safety.

Building Your Gazebo or Pavilion

- Provide support posts at each corner of the structure and every four feet on centre between corner posts as needed. The number of posts will vary with the size of your structure.
- Secure support posts approximately four feet in the ground with cement to ensure the structure will not shift with frost (the depth may vary in your region, so check with your School Board's Design Department before beginning).
- Use wood that has not been treated with chemicals where students will come in contact with it.
- Use galvanized screws and fasteners for durability and rust resistance. Do not use nails since they can catch on clothing or skin.



Toniata Public School



Teaching Tradition

*Kahronianhonha Mohawk Immersion School,
Kahnawake Mohawk Territory, Quebec*

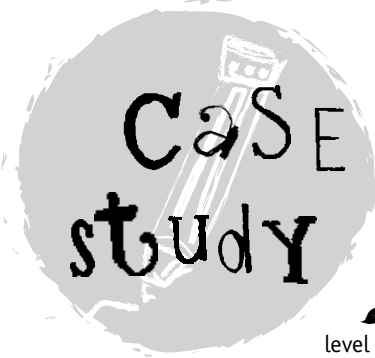
Central to Kahronianhonha Mohawk Immersion School is the teaching of Native beliefs and philosophy. Their arboretum resembles a traditional longhouse, the original homes of the Iroquois people. In keeping with tradition, the opening of the three- by six-metre (10- by 20-foot) structure faces east, to greet the rising of the sun each day. Within the arboretum there are benches so the children can receive some of their class instruction outside, or simply sit and ponder at their leisure. Six cedars were planted around the perimeter of the building. Cedar is a traditional tree of the Iroquois people and is considered to have a calming effect. Morning Glory and wild grape were planted so they would climb the structure providing cooling shade during hot summer months.



Kahronianhonha Mohawk Immersion School

The Sun Shelter

Formally constructed sun shelters are not common on school grounds. But one shelter, constructed in 1996 at Edmison Heights Public School in Peterborough, Ontario has proven to be a model that could lead the way to incorporating sun shelters on every school ground. The design details for Edmison's sun shelter demonstrate what can be constructed on your school grounds.



Respite from the Rays Edmison Heights Public School, Peterborough, ON

Our school's sun shelter is an A-frame, post-and-beam structure that measures approximately 6.5 by 6.5 metres (21 by 21 feet). It was built by a team of parent and teacher volunteers over the course of two weekends for a cost of about \$2,000. It consists of the following elements.

- Four six-inch by six-inch columns were anchored four feet in the ground with limestone screenings on each side.
- The roof peak is 10 feet above ground level and it slopes to seven feet above ground level, where it connects to the columns on each side. The roof is covered in green sheet metal. The interior of the roof has six-inch by six-inch horizontal cross members providing its support.
- Seven-foot sections of old utility poles were cut in half length-wise to provide bench seating for about 50 students on the shelter's grass floor.



Edmison Heights Public School

The shelter has proven very popular with students, especially those who do not wish to play sports or go on the climbers. At every recess during spring and fall groups of friends head to the shelter to sit and talk, play and even draw or do homework. The structure also acts as a gathering place for classes that are using the adjacent natural area and provides a defined teaching space where students can concentrate with less distraction and teachers can maintain a better sense of control.

(Adapted from the article "Sun Shelters: Respite from Rays" in *Greening School Grounds*)

Shade from Trees, Shrubs and Vines

Providing shade using trees and shrubs is an important element that should be considered in conjunction with built structures. Here are a few guidelines to help select the best shade options.

- Deciduous trees are better than coniferous for offering protection from the midday sun. The rounded form of deciduous trees casts a shadow over a larger area than the conical shape of most evergreens. Keep in mind that deciduous trees only perform this function when their leaves are fully out — other forms of protection will be required in the spring.
- Spreading (e.g. oak, maple, beech, ash) and weeping (e.g. willow) deciduous trees provide more shade than more upright varieties (e.g. poplar).
- Grouping trees provides more shade in one area than planting single trees in a number of areas. This planting pattern may better reflect the way students use the school grounds, such as gathering as a group to play or talk. Plant groups of trees in a circular shape or an alley to achieve this effect.
- Vines and shrubs can be used along arbors, trellises and pergolas to provide additional shade.
- Provide seating under existing shade trees.

2 Temporary Structures



Awnings

Awnings and free-standing tents can provide protection from solar radiation while still letting light and breeze into the area. These temporary structures can also be important for sporting events like track and field meets during the school year.

- Create your own awnings by stretching some fabric netting between four posts or between building walls. This is an easy way to provide temporary shade and the pieces can be dismantled and stored for use again.
- Consider buying or creating awnings over entrances where students gather and wait for rides. These can be created using slats of wood or sturdy fabric that are supported by brackets attached to the school wall.



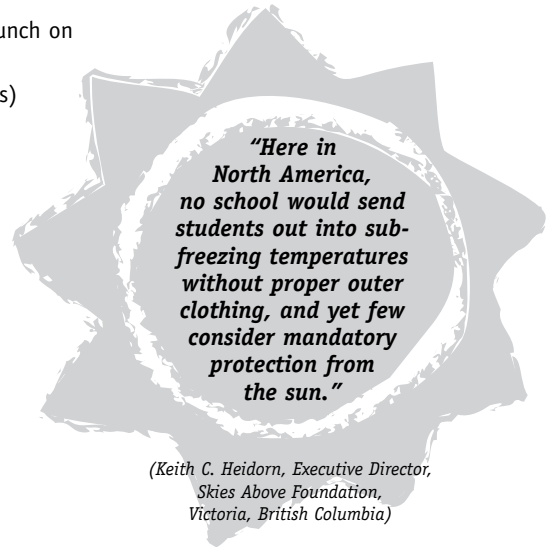
Umbrellas

- ✦ Provide umbrellas over tables and benches on the school grounds. Ask for donations of used umbrellas from local restaurants to save on costs. Or take up a collection from parents and community members who may have old golf umbrellas they would be willing to donate
- ✦ Decorate umbrellas to fit with the theme on your school grounds.

Codes and Safety Standards

Sun shelters that provide shade on school grounds need to conform to similar building standards as benches — don't use pressure-treated lumber or nails, and use galvanized steel and create sturdy joints. However, the most important safety standards that school's can implement may actually be in reducing student's exposure to solar UV radiation. The following are some suggestions.

- ✦ Schedule outdoor classes and activities in non-peak sun hours.
- ✦ Provide alternative indoor activities in the gym or the library for recess and lunch on extremely hot days.
- ✦ Encourage students to wear protective clothing (long-sleeves, hats, sunglasses) and sunscreen.
- ✦ Provide a variety of shade features in a number of areas on your school grounds. This is especially important around asphalt and sand surfaces which reflect much more UV radiation than grass.
- ✦ Replace asphalt surfaces with more natural areas, where possible.
- ✦ Practice and model sun-safe behaviour to set an example for students
- ✦ Provide education programs to inform students, teachers and parents about sun exposure.



Where to *go* from here?

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Other books and articles

Heidorn, K.C. and Torrie B. The Skies Above Foundation. *Guide for SUNsafe Schools*. Victoria, British Columbia: The Skies Above Foundation, 1994. Available for \$10 from The Skies Above Foundation, 2701 Seaview Road, Victoria, BC, V8N 1K7 or www.SkiesAbove.org.

Example projects

Edmison Heights Public School, Peterborough, Ontario: (705) 745-0722
Kahronianhonha Mohawk Immersion School, Kahnawake Mohawk Territory, Quebec: (450) 635-0600
Toniata Public School, Brockville, Ontario: (613) 342-6310