

EXPERIENTIAL OUTDOOR LEARNING IN THE SCHOOLYARD

FEATURING CURRICULA BY SUSAN HUMPHRIES




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Experiential Outdoor Learning in the Schoolyard

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Green Schoolyards America seeks to transform asphalt-covered school grounds into park-like green spaces that improve children's well-being, learning, and play while contributing to the ecological health and resilience of our cities. We are working to change the norm for school ground design, use, and management so that all children and youth will have access to the natural world, every day, right outside their classroom door. Our work includes:

- **Research** that connects children's well-being and academic achievement to the ecological health of their school ground and neighborhood environments.
- **Policy** advocacy that enables school grounds to become dynamic, multi-use, nature-filled public spaces that benefit children and the environment at the same time.
- **Support** for school districts, public agencies, and other colleagues to help develop city- and state-wide living school ground initiatives.

Please visit our website for more information:

greenschoolyards.org



About this Publication

Green Schoolyards America was honored to feature the work of our esteemed colleague, Susan Humphries, MBE, MA, at a two-day conference entitled *Experiential Outdoor Learning in the Schoolyard*. The event was held September 27-28, 2019 on the beautiful campus of Golestan School in El Cerrito, California. During the conference, Ms. Humphries shared her expertise in how to use school grounds to foster children's learning, play, and happiness. Her time-tested teaching methods are based on hands-on outdoor experiences and a deep understanding of child development and the natural world.

This short book, with same title as the conference, was developed to capture the essence of the hands-on workshops taught during our two-day event. We hope that our conference attendees and teachers around the world will try these engaging outdoor learning ideas at their own schools.

Experiential Outdoor Learning in the Schoolyard includes a collection of 13 hands-on activities created by Susan Humphries. They were originally developed for use at The Coombes School in Berkshire, England, where she was the Headteacher for many years. The activities blend poetry, visual art, art display, and performance with science, math, experiential history, and writing. Many of the activities emphasize hands-on investigation, observation skills, analysis, team work, cooperation, imagery, and symbolism. Others highlight the magic and wonder of the natural world, a sense of place, contemplation, reflection, empathy, and peace.

The activities described in the pages that follow are intended for use with children of all ages, from preschool through high school. Each outdoor learning idea is explained in a 1-4 page format that contains all of the information needed to successfully complete the activity, including directions and a list of any necessary materials. Each activity includes a

proposed age range, and Ms. Humphries encourages teachers to adapt the curriculum ideas to the ages of the students they work with.

Green Schoolyards America encourages readers to explore all of the ideas in this publication, to bring joy and magic to students at a school in your own neighborhood. We also hope you will use these experiential outdoor learning ideas in conjunction with additional school ground activities found in our companion publications, the *Living Schoolyard Activity Guide* and the *International School Grounds Month Activity Guide*, produced in partnership with our colleagues at the International School Grounds Alliance. Please visit our website to download free copies of all of these publications:

greenschoolyards.org



Photo on previous page: Conference attendees release homing pigeons at the end of the first day of the conference, with Susan Humphries and pigeon expert Bill Milestone.

Background

Susan Humphries, MBE, MA is the Founding Headteacher of The Coombes School in Berkshire, England. Her work at Coombes over 50 years has influenced outdoor experiential education for schools around the world. She brings a wealth of knowledge and expertise in teaching methods that are based on outdoor experiences and a deep understanding of both the natural world and child development. She is recognized as one of the international founders of the green schoolyard movement, and has provided professional development training for hundreds of teachers.

In 2011, Ms. Humphries was awarded an Honorary Doctorate by the Faculty of Natural Resources and Agricultural Sciences at the Swedish University of Agricultural Sciences in Uppsala, Sweden to acknowledge the foundations she has laid in building individual and group responsibility for healthy ecosystems and use of natural resources. In 2012, Humphries collaborated with her colleague Susan Rowe to write a book called *The Coombes Approach: Learning through an Experiential and Outdoor Curriculum*, to share teaching methods used at the school. In 2018, she received a Lifetime Achievement Award from the International School Grounds Alliance to recognize the formative impact her ideas have had on the green schoolyard movement across the globe.

When The Coombes School opened in 1971 in the village of Arborfield about an hour outside of London, England, the landscape included a small pad of asphalt and more than five acres of grass. Like most schools designed with this traditional landscape palette, there was very little for the children to do outdoors, and the environment provided few educational resources for the teachers to use in their curriculum. Ms. Humphries set about changing this in collaboration with her faculty, the children, their parents, and members of the surrounding community.

Over more than four decades, the children at Coombes (ages 4-11 years old) planted trees, shrubs, herbs, and flowers, creating rich ecological systems for local wildlife and the school community to enjoy. The trees they planted became a forest, with well-placed clearings for outdoor classroom spaces and play areas, and an unending source of wood to cut and use for any project they imagined. Local partners and artists helped to reshape the landscape to include more hills, valleys,



1971

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1985

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2018

© GOOGLE MAPS, WITH MASKING

Above: Views of The Coombes School over time, showing the change from a bare asphalt and grass school site to a school set within a thriving forest ecosystem. The 2018 aerial photograph above shows the school site at its best, before a new administration with a different educational philosophy tragically removed a substantial number of trees.



boulders, and winding pathways—adding a sense of mystery and adventure to the site, and making the school grounds feel much bigger than the six acres they actually covered.

The curriculum and educational philosophy of The Coombes School grew with the developing grounds. Humphries and her colleagues built a learning community based on collaboration, cooperation, and kindness. Their interdisciplinary project-based learning approach blends science and math, with literacy and experiential history. This brings learning to life in ways that engage children deeply, and creates authentic and memorable experiences that help children understand the world around them while beginning to write their own stories of their place within it.

The child-centered approach at Coombes also gives children what they need to grow and develop optimally. It recognizes their basic human needs to build relationships and be a part of a caring community, and it is set within the context of nature's beautiful interconnected systems and the web of life.

The vibrant school grounds at Coombes are a product of the school's curriculum, the context for that curriculum, and often the subject of the curriculum. This pivotal environment, enriched over decades, has helped generations of children grow up with a deeper understanding of each other and their community, while mastering the educational concepts central to their curriculum. It is a model that many schools aspire to follow around the world.

We invite you to experience the approach used at Coombes, as you share the curriculum examples in this book with schools you work with, wherever you live.



For more information about the curriculum and philosophy of The Coombes School, please see:

Humphries, Susan and Susan Rowe. *The Coombes Approach: Learning through an Experiential and Outdoor Curriculum*. Continuum, 2012, London, UK.

“At the Coombes we only had one rule: we care for each other. In this spirit, we all taught one another—children learnt from other children, teachers learnt from other teachers. The environment established was one of non-competition, but cooperation. The children grew together and moderated each other’s behaviour.”

— Susan Humphries



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Above: Conference attendees participate in hands-on workshops with Susan Humphries, September 2019.



CREATE RUBBINGS TO RECORD THE ENVIRONMENT

AGES

3–18+ years old

CONTRIBUTED BY

Susan Humphries

The Coombes School

Berkshire, England, United Kingdom



© SUSAN HUMPHRIES

Collecting rubbings from various surfaces across an area that is well known to children can prompt a discussion about the effects of different textures and produce a record of the place they are exploring. Children can include elements that are important to them in their rubbing, to put “themselves” into their record of the place they are visiting.

MATERIALS

- Wax sticks such as those used by cobblers or for brass rubbings, make highly detailed rubbings. Some wax crayons can also be used, but they produce less detailed effects.
- Paper used for brass rubbings, e.g strong, thin, matte finished, grease-proof paper. Light weight computer printer paper will also work.
- Black construction paper (sugar paper) for mounting
- Glue stick and scissors
- Ink pads, in multiple colors
- A box of safety pins and a sheet, for the display

GUIDING PRINCIPLE

Each student’s completed rubbing should tell a visual story of the place they are documenting, while also including themselves in that place in some way.

DIRECTIONS

Bring students out into the school grounds or another outdoor environment that is meaningful for them. Ask the students to take rubbings of a wide variety of elements in the place they are exploring. The textures they select should include items that are personally important to them, but they should ensure that the natural environment around them in this place is equally well-represented in the finished visual statement. Students may use the ink pads to add their fingerprints and other marks to their rubbing.

After each student has finished their drawing, they may cut it into a shape that pleases them, and then glue it onto a piece of black paper, applying the glue from the centre of the example to the edge. Prior to mounting the rubbings, cut away most of the unused paper so that the patchwork rubbing design has continuity.

Each mounted drawing can then be attached to a flat bed sheet, using safety pins, to create a collective exhibition to be shared with others. The sheet may be hung from the schoolyard fence or another surface to create a temporary art installation that reflects the class’s experience in the place they visited. Styles will be different but the overall effect should be informative and constructive.



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QUILLS: AN EXPERIENCE OF DISCOVERY

AGES

5–18+ years old

CONTRIBUTED BY

Susan Humphries

The Coombes School

Berkshire, England, United Kingdom



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The long, flight feathers on birds' wings are called Pen Feathers. These strong, flexible feathers were used by authors, poets and philosophers over many centuries as writing quills. The Laws of Society, the Wills, Testaments and Beliefs were all recorded using quills with ink mainly derived from oak galls, vinegar, iron filings, and honey. The recipes for inks were passed down from generation to generation. Although time affects the inks' pigments, turning the written words from black to brown, the scripts are indelible and the Magna Carter, a Bills of Sale written in the 1600s, and the collection of laws held by the Law Society from centuries past are as legible now as they were in the year they were created.

MATERIALS

- Feathers from geese, eagles, kites, or swans; 1 per child
- Dense black ink (often sold as Indian Ink)
- High quality writing or drawing paper of different sizes
- Small cutting block (e.g. an old bread board)
- Sharp craft knives
- Shallow but stable ink containers. Old saucers are best because they limit the amount of ink that can be picked up with a single dip of the quill.

BACKGROUND

Paper. Long ago, important legal and religious documents were written on vellum, which is a thin material made from the skin of any young animal (e.g. a goat kid, lamb, etc.), or on parchment (made from calf skin). Mistakes were scraped off when the ink had dried, and any blobs that developed were removed the same way. A sheet of vellum can be used a second time once the previous writing has been scraped away.

Quills. To make a bird's flight feather into a quill pen, the tip of the feather is cut on a slant. This allows the writer to make a thicker line on the downward stroke of each letter. Calligraphy in Europe began as an art form derived from the characteristics of the quill pen. Culture is, in many ways, formed by the richness of the natural world.

DIRECTIONS

Select a comfortable location for the class to gather and draw, either inside in the classroom or outside in the school grounds in a place with writing surfaces (e.g. picnic tables, flat metal benches, a large smooth rock). Select a location and writing surface that won't be damaged by permanent ink!

Cut the end of each flight feather on a slant to create a quill pen for each student. (Older students can cut the tip themselves.)

Ask the students to use their quill to write their name and create a series of loops on the page. As they do this, they can try to feel the rhythm of writing with this ancient tool. Recut the end of the quills if they splinter.

Put all of the students' drawings in a place where they can dry, undisturbed. (Black ink is often very permanent!)

When the drawings are dry, hang them up to create a display.



DECONSTRUCTING FEATHERS

AGES

3–18+ years old

CONTRIBUTED BY

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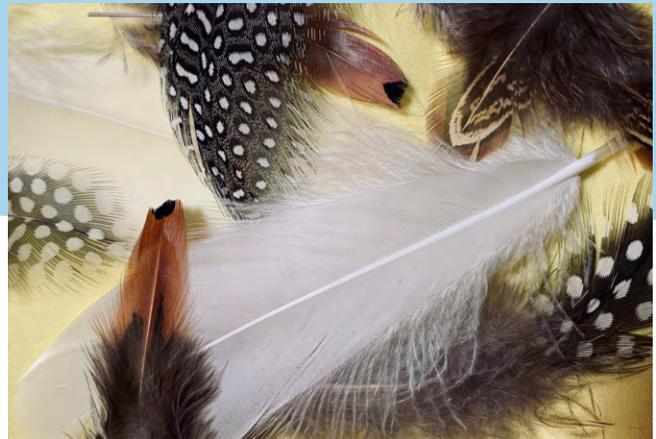
A bird's flight feathers are a structural marvel for people of all ages to explore. In this activity, students closely examine a selection of pin feathers to understand how their components work together to create surfaces that help to trap air and produce lift for flight.

MATERIALS

- A selection of pin feathers
- A sharp knife
- A cutting board for crafts
- Magnifying glasses, for closer examination

BACKGROUND

A bird's flight feathers each consist of a central shaft called the quill, with a system of parallel barbs extending outwards from it (shown above). The barbs, in turn, have smaller filaments called barbules sticking out from them (shown below). These barbules have hooklets on them which zip together providing a flat, smooth surface called a vane. The flat surface of the vane catches the air like a parachute to help the bird soar and steer through the air.



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DIRECTIONS

Give each student a selection of pin feathers. Encourage them to experiment by unhooking the feathers' barbs and then re-hooking them. By stroking the filaments gently downward to part the edges and then stroking upwards, they can bring the tiny hooks back together again and lock them back to a smooth mesh. (This process works in a manner that is similar to the adhesive properties of "hook and loop" fasteners.)

Ask children to notice the contour of each feather, and think about how that helps to explain the shape of the bird. Feathers are light, tough, and durable padding that trap body heat to keep birds warm. They also have substantial surface area, which can also allow excess heat to pass through the fibres to cool the bird.

As feathers fray and wear over time, the bird renews them so that during a year a bird has completely regrown its feathers. Flight feathers and tail feathers are discarded in pairs so that the bird's balance is maintained.

Encourage each student to strip a feather in a parallel way by pulling out the filaments with their fingers, systematically from the base. Encourage them to examine all the removed parts as they strip the feathers down to the quill.

Finally cut the quill and examine the core in a systematic way.

Discuss findings at every stage. Use magnifying glasses for closer examination, if desired.



POETRY TRAIL

AGES

7–18+ years old

CONTRIBUTED BY

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Poems are an important artform that students of all ages can enjoy. Many poems are windows into another time, place, or culture. They often express the poet's feelings about the world around them and share their insights through skillful use of language. This activity encourages an intensive study of a poem in an engaging, collaborative format.

MATERIALS AND PREPARATION

- Select a poem related to a topic the class is studying.
- Print a copy of the poem and divide it into sections with 2, 3, or 4 lines in each one. Mount each of these sections separately on its own sturdy piece of cardstock. (Optional: Laminate each card for future use.)
- Select an area of the school grounds that students can access that includes low hanging tree branches, sturdy shrubs, and/or fences that afford the opportunity to temporarily attach poem cards for display.
- Use string or clips to temporarily attach the poem cards to trees or other structures in the school grounds. Arrange the sections of the poem so that they are not in their original order—or so that students need to hunt for them across a designated area of the grounds.
- Prepare a set of clipboards with paper and pencils for each child.



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DIRECTIONS

Take the class out into a comfortable gathering area in the school grounds. Read the selected poem with the class, in its entirety, in the order and manner the poet intended. Discuss the poem's significance with the class, as well as its background, history, and connections to topics being studied.

Divide the class into small groups or pairs. Equip each child with their own clipboard and writing materials.

Ask each group to travel around the school grounds together, to find and record all of the sections of poetry that are hanging in the grounds. After everyone in their group has transcribed all of the sections of the poem, they are to collaborate to try to reassemble the poem in the order the poet intended.

When each group is confident that they have reassembled the poem, gather the class back together again and hold a poetry reading to hear what they came up with. Did everyone remember the poem the same way? If any of the groups had some lines out of order, did the meaning change?

TIPS AND EXTENSIONS

- Try this activity with shorter poems for younger students, and longer poems for older students.
- Use a very short version of a well-known tale or text instead of a poem.
- Select a poem in another language and use the activity as part of a language lesson.



CREATE A PORTRAIT INSPIRED BY ARCIMBOLDO

AGES

4–18+ years old

CONTRIBUTED BY

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Giuseppe Arcimboldo (1526-1593) was an artist with a fascination for plants, and especially vegetable forms. He became a resident court painter for Emperor Maximilian at his court in Vienna, Austria and was given free rein to indulge his interest. Maximilian admired his work and his support of Arcimboldo never waned. The result was a repertoire of ingenious and idiosyncratic masterpieces which were added to the royal collection. Many of Arcimboldo's paintings were portraits rendered using the forms of vegetables, fruits, and other plants to convey their subject. Today, many of his works can be viewed at the National Art Gallery in Vienna and online.

MATERIALS

- Vegetables and fruits of all sorts, along with their foliage
- Mushrooms, nuts, berries, beans, and grains
- A few flowers
- At least four large, strong, shallow boxes with handles for transporting the fresh produce. (Visit supermarkets to seek out produce at the end of its shelf life, to keep costs down.)
- A clean sheet or cloth to present the produce
- 30 different postcards of Arcimboldo's work
- A camera and/or paint sets, to document the portraits



© SUSAN HUMPHRIES

DIRECTIONS

Seeing ordinary vegetables as exotic foods and arranging the vegetables to make a portrait (following Arcimboldo's style) is challenging and can be a fine aesthetic experience.

Gather the students around boxes of fruits and vegetables. Then, ask them to work together to name and handle every vegetable and fruit item in the boxes. Pass a sample of every item (celeriac, garlic, turnip, onion, spinach, etc.) from hand to hand, encouraging the students to sniff them, turn them, and carefully replace them in their boxes.

When all the items have been acknowledged by feel, smell, colour, and shape, send thirty postcards of Arcimboldo's work around the class, too. Explain that in the activity today, the class will create their own portraits with vegetables and fruit, inspired by Arcimboldo's work. Children will work in pairs or small groups as they make a model of a head on the ground.

After the children are satisfied with their fruit and vegetable portraits, the next step is to document them. Arcimboldo made paintings of his models, and your class can do the same. Alternatively, each arrangement may be captured using a camera to record the children's work.

After recording them, dismantle the portraits and arrange the food items neatly in their boxes for the next class to use. When the activity is complete, cook a meal with the produce.

Create an art gallery in the classroom, using the images of the children's work (as paintings or photographs).



PIGEONS AND DOVES IN ART

AGES

5–18+ years old

CONTRIBUTED BY

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The affinity between people and birds goes back for centuries and still resonates today. Pigeons and doves, in particular, appear in artwork across cultures around the world, in both secular and religious contexts. In this activity, children explore the way that these iconic birds are represented in art and then try their hand at making their own artwork that includes doves.

MATERIALS

- A selection of printed copies of famous paintings that include doves or pigeons, and other three-dimensional artwork (wood, ceramics) that features doves or pigeons
- Books of fiction and non-fiction featuring pigeons or doves. *Mr. Potter's Pigeon* is a good choice for young children.
- Art materials to create pigeon/dove-themed artwork: playground chalk to create drawings on the pavement, or strips of white fabric to weave a dove on the school's fence

BACKGROUND

Pigeons and doves have featured prominently in artwork since ancient times as symbols of traditional sacrifice, as a sacred and secular messenger, and as a source of food—imbuing them with cultural significance around the world. For example, the Roman catacombs feature many references to doves. Aphrodite and Venus are associated with symbolic doves and their images appear in frescoes and on ancient Greek coins. The Noah legend also includes a dove. In modern times, famous artists such as Picasso (whose dove is featured on peace flags), Magritte, Gaudi, and others included doves as symbols in their work.

Pigeons and doves were also important communication tools in past centuries, carrying time-sensitive messages across great distances more quickly than the fastest horse could run. Even today, pigeon-fanciers in many countries still race homing pigeons as a hobby, keeping this tradition alive. In keeping with centuries-old tradition, doves are also often released as part of important ceremonies and events, such as the Olympics and at weddings.



© SUSAN HUMPHRIES

DIRECTIONS

Set up a display of at least four printed copies of ancient and modern famous images or paintings that include pigeons or doves, and a selection of three-dimensional artwork featuring the birds in wood or ceramic. This small collection is a tribute to a vast iconography honouring this bird.

Introduce the collection of artwork, and explain the significance of pigeons and doves across the millennia and around the world. Study the ways that the artists you are highlighting used doves as symbols in their work, and how they represented them using different materials. Read books of fiction and non-fiction about pigeons/doves with the students to broaden their understanding of the topic.

Select an art project to do with the students in the schoolyard, that will bring the tradition of pigeons and doves in art to your own school grounds. Some possibilities include:

- Create chalk drawings of doves across an entire paved playground or walkway (below)
- Weave a peace dove into the school's chain-link fence, using strips of white cloth (shown above)
- Paint or construct your own image of a dove or pigeon



COLOUR WALK

AGES

4–18+ years old

CONTRIBUTED BY

Susan Humphries

The Coombes School
Berkshire, England, United Kingdom



© SUSAN HUMPHRIES

Every landscape has its own, unique colour palette. In this activity, students will take tiny colour samples from across an area of their school grounds, to better understand the wide range of colours found in their own environment. This activity may be repeated in different places on the grounds to further understand how the muted colours found in paved spaces onsite differs from the living colour palette in places where trees, shrubs, flowers, and other plants are abundant.

MATERIALS

- 1 piece of cardboard per student, 8" x 3"
- Broad band, double-sided sticky/cello tape

PREPARATION

Prepare one cardboard palette tool per student, by adding a broad strip of double-sided sticky/cello tape down the centre of each piece of cardboard. Be sure to keep the upper side of the tape covered until they are distributed to the class.

DIRECTIONS

Gather the class outside on the school grounds, in a paved area or a planted space. Explain that the class will be exploring the landscape to better understand all of the colours around them every day. To do this, they will collect minuscule samples of these colours from places they find them on the ground—and places the teacher has told them are alright to carefully pick from live plants.

Give each student a prepared palette tool, with the sticky tape surface still covered. Ask them to go out into the grounds and collect tiny examples of all of the different colors they can find, and stick them to the taped surface as they collect them. This will work best if they do not remove the tape's protective covering all at once. Instead, recommend that they draw the tape's protective layer down inch by inch as they work, until they have collected evidence of colour from perimeter to perimeter, and completely covered the tape.

Exhibit the cards together at the conclusion of this exercise, and discuss them. Students can describe the variety of colours they found in paved areas of the grounds—which should also include many samples of plants they might have found coming through cracks in the pavement, flowing out of pots and other containers, or growing over nearby fences. Is the colour palette the students collected in the paved playground monotone, or has nature triumphed in their samples?

If the class members explored different areas of the grounds, group their cards according to where they walked, and compare the results. What is happening in the educational surroundings? What can the colours we find tell us about our environment?

EXTENSIONS

- Display these colour samples in a school exhibition, for comment and admiration.
- Laminate the colour cards and use them as bookmarks.



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SHEET BOUNCING

AGES

3–18+ years old

CONTRIBUTED BY

Susan Humphries

The Coombes School

Berkshire, England, United Kingdom



© SUSAN HUMPHRIES

Sheet bouncing is an exercise that engages social and cooperative learning—skills that help children and adults get to know one another, share space, and become successful members of a team. These are fundamental life skills. This activity demonstrates that everyone’s efforts are valuable, and conveys the feelings and drama of working together. Teachers regularly need to ask themselves the question, “Do children get enough opportunities to practise the skills of being effective group members?” and “Are we getting experience of this at our own level?”

MATERIALS

- 4 double flat bed sheets (1 per group of students)
- 3 large soft toys
- 6 small soft toys

DIRECTIONS

Select an outdoor location for this activity that has plenty of space to allow four groups of students to gather around the edges of four bed sheets, with additional space to move and experiment with the sheets.

Divide the class into four equal groups and give each group one flat bed sheet. Position the four groups around their own sheets in a square formation, so each sheet makes up one quadrant of a larger square.

Ask the students to hold the four edges of their bed sheet and practice trapping air under it by lifting it together and bringing it down simultaneously. This is similar to working with a parachute, which is also valuable for experimentation. Sheets are more suitable for this particular activity since the four groups will be working cooperatively.

Tell the students that their goal is to move the soft toys from one group to the next by bouncing them off of the air that is trapped by their group’s sheet. The toys must rotate around the four sheets without hitting the ground.

To begin, add three small soft toys, one at a time, to the first group’s sheet. Ask the class to bounce the toys along the circuit until they return to their point of origin at the first sheet.

After the first group of toys have successfully made their initial journey around the circuit, add a few more challenges:

- Introduce three pairs of toys with roughly the same weight, and send them to travel around the circuit at the same time.
- Substitute one heavier/larger soft toy for one of the smaller/lighter soft toys in each pair. Try to send three sets of mismatched pairs around the circuit.

Discuss the ways that the toys’ size and weight have changed the techniques the groups needed to use.

EXTENSIONS

Connect this activity to age-appropriate physics lessons.

Use different materials, such as leaves, to visualize and explore the ways that air currents move around and are trapped by the sheet.



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SHEPHERD'S CROOK LABYRINTHS

AGES

5–18+ years old

CONTRIBUTED BY

Susan Humphries

The Coombes School

Berkshire, England, United Kingdom



© SUSAN HUMPHRIES

Creating a labyrinth on your school ground is an exercise that engages mathematical design, promotes collaboration, provides opportunities to practice self-control, and offers time to reflect as a group. Creating and walking a labyrinth evokes ancient history, symbolism, peace, and stability while promoting a sense of place, and improving mental welfare. It is also a chance for teachers to share and explore mathematical relationships with their students, such as expression of order and symmetry, and concepts like line length, radius, circumference, and $n r^2$.

MATERIALS

- Labyrinths can be created on pavement and soft ground surfaces using moveable loose materials such as rocks (shown above), that are heavy enough not to blow away in the wind and are light enough that students can move them easily. To create a labyrinth, you will need 300–400 hundred pieces of the material you select, depending on their size.
- In this activity, we will describe a labyrinth made from hundreds of pairs of old shoes, no longer needed by the students or their families. To find the shoes to use for this project, ask all of the students at your school to see if their family has a few pairs that they no longer need—or that could be borrowed for the duration of the activity. Plan to donate the unneeded shoes to a reuse shop, after the project is over.
- 10 pieces of wood, each 1 m long and 2 cm wide, for measuring consistent widths of each lane. Meter sticks or yard sticks are often the easiest measuring tool to use.
- Chalk, paint, string, or other material to lay out the initial plan
- Paper, pencils, and rulers for each student, to make a practice labyrinth at a smaller scale
- An image of a labyrinth design, for reference. We have included a detailed labyrinth drawing on the next page, along with a written description.

BACKGROUND

Labyrinths are ancient patterns that have been in use for more than 2000 years. Originally developed in ancient Crete, labyrinth designs were later used by the Roman Empire and spread widely. They have been represented on cave walls, coins, and pottery, but most often appear on the ground where the paths they create can be travelled.

Unlike mazes, labyrinths have a single path of uniform width that can be followed continuously from the exterior to the interior and back again. This configuration makes the pattern very useful for meditation and rituals. Single path labyrinths can often be found in churches around the world, and in other places where therapeutic benefits of meditation are valued.

In this activity, we will use old shoes to create a labyrinth design on the paved school ground. We have selected these materials so that students can “walk the paths that others have walked”, and try to “put themselves into other people’s shoes” as they imagine the places those shoes have taken people they haven’t met.

Walking a labyrinth of shoes will give the students insights into other people’s lives, and will help them imagine being a different age or engaging in new activities. When they walk a labyrinth made of shoes, they will observe a wide range of human pastimes and needs, represented along their walk. The labyrinth might include shoes such as flipflops for the beach, riding boots, walking boots, party shoes, and slippers for enjoying the comforts of home.



10. The last step in the drawing (red line in the diagram) begins at point “A” at the bottom of the original cross. From “A”, draw a straight, horizontal line that extends eight stick-lengths to the right. Turn at a right angle and draw the final arc until it travels all the way around to the left side of the labyrinth. Make a right angle turn and draw a straight line to the right, until it meets the bottom left corner at point “H”.

You will now see that you have created a single entrance and exit. This means that people reaching the centre will turn and retrace their steps, passing others who are still making the journey towards the centre. This is why the pathways need to be sufficiently wide for people to pass each other.

CONSTRUCTION TIPS

It is difficult to finish building a labyrinth with a single class. When subsequent classes arrive to work on the labyrinth, each group will continue where the previous one has left off. In doing so, they will adjust any errors they find, and visually check for consistency. The labyrinth should be consistent (evenly measured!), and pleasing to the eye.

The completed labyrinth should be an undeviating pattern and the results on the ground should result in a perfect mathematical form.



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The labyrinth is marked with objects to give it visual interest and emotional resonance. Its visual appeal depends on the material exactly bisecting the guide lines. Chalk should be completely covered so that it is not evident.

If the class is using shoes to make the labyrinth, the overall visual message should consist of different foot patterns, with careful arrangements of shoe sizes and types.



WALKING THE LABYRINTH

When the labyrinth is complete, plan to walk it with everyone who helped to make it. It may be walked in silence or with a musical accompaniment (live or recorded). The music should be in measured time (e.g. using a piece such as Pachelbel's Canon), so that the journey through the labyrinth can be made in strides of equal length, bringing comfort and reassurance to the walker.

PROTOCOLS

- Entry to and egress from a labyrinth is exclusively accomplished via the single travel path/lane.
- Established protocol dictates that those walking toward the centre have the right of way. When travellers moving in both directions occupy a lane at the same time, the travellers moving outwards stand still until the group travelling inwards has passed them. Travellers try not to jostle each other, and may only brush each other lightly.
- All walkers travel in silence, with measured steps, in order to absorb the rhythms of the design.
- When materials demarcating the lanes are jostled out of place, they must be fixed since the overall pattern is a vital component of the experience.

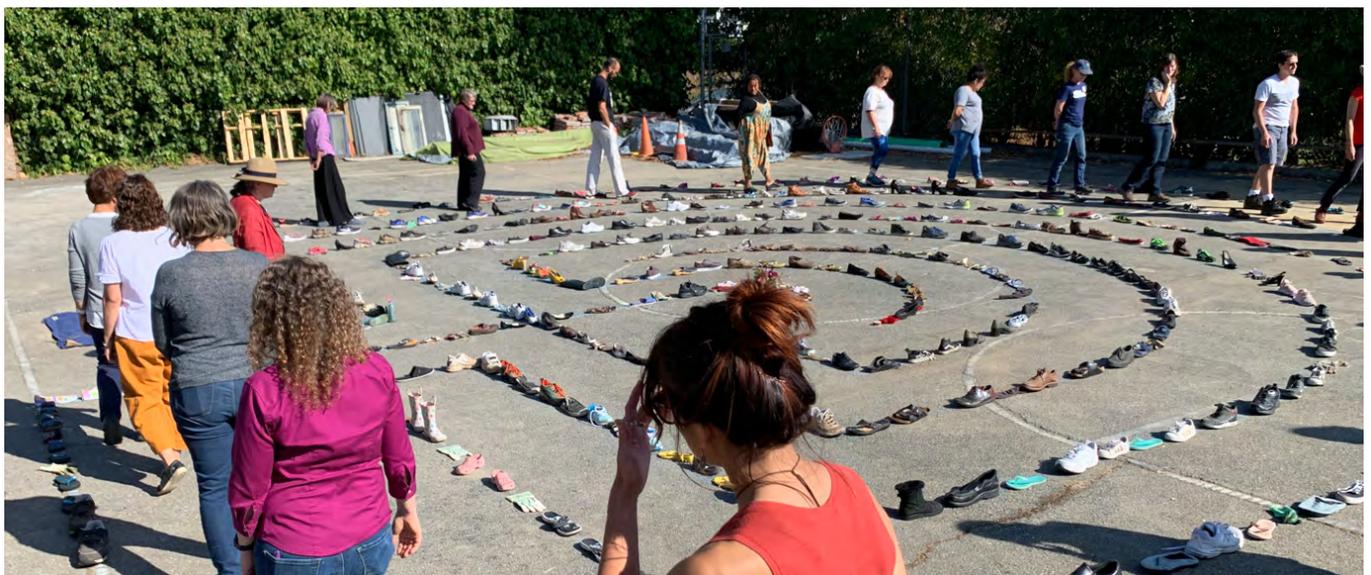
EXTENSIONS

- Using identical printed copies of the labyrinth, trace the designs with both hands, using right and left index fingers. This uses both sides of the body and brain.



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- Using chalk, charcoal, pencil or a computer-generated tool, design your own labyrinth. All the schemes should demonstrate the journey to the centre and out again.
- Look online for labyrinths around the world, particularly noting Chartres cathedral as one of the finest. Research Greek mythology's stories about Ariadne and the Minotaur. (Note that the Minotaur's "labyrinth" is really a maze!)
- Look for sayings about feet and shoes, demonstrating the number and variety of maxims using these words throughout history and around the world. For example, "one foot in the grave"; "jumping in with both feet"; "you have to be fast on your feet"; "wait for the other shoe to drop"; "Keep your eyes on the stars, and your feet on the ground."



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EXPLORING FEATHERS IN THE AIR

AGES

4–18+ years old

CONTRIBUTED BY

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© SUSAN HUMPHRIES

People around the world have been relying on birds for thousands of years, and continue to do so today. Birds' feathers have unique structures that interact with the air around them, allowing them to fly and keeping the birds warm. The three activities below explore the interaction of feathers with the air in ways that are memorable for children.

MATERIALS

- Feather casting: 1 handful of down feathers for each child
- Pillow toss: 1 feather-filled pillow
- Balancing activity: 1 male peacock tail feather, per person, ideally at least 30" long

BACKGROUND

Birds grow feathers for various purposes — their coat of feathers gives them a waterproof surface (oil from the preen gland provides for upkeep) and the shaped feathers are a seal to maintain a constant body temperature. The down feathers and the hair-like filoplumes are also used for insulation and possibly serve as sensory receptors.

Flight feathers and tail feathers are characterised by their length and their stiff quills. Feathers are kept in shape by constant preening and the types of feathers are grown to help the bird fly, hunt, attract its own kind, restore its covering and maintain its lifestyle.

Some of these characteristics have been exploited by man: We have used many birds as food, collected their wings as brushes, their feathers for bedding and cushions, and their plumes as fashion accessories. Their quills are used as toothpicks and for writing and artwork. We still think of them as being there for us and we take them for granted. As with many other species, their numbers have plummeted and a better understanding of this animal group could help us appreciate them more.

DIRECTIONS

PART I — FEATHER CASTING

Birds are symmetrical. Their feather structure matches on each side. When a feather gets damaged, the bird casts it off and the identical feather from the other side, although undamaged, is also cast. Birds' feathers are a balanced system.

Stand in a tight circle with the class, and give each person a handful of down feathers to release at the same time. Observe how the feathers float on natural air currents, and on currents of air they blow themselves. Most feathers will fall to the ground but there will be additional up-currents to support some that remain airborne. When all feathers have settled to the ground, gather them up before they blow away and repeat the experiment two more times.

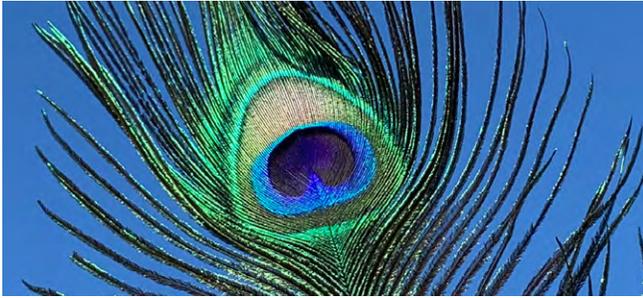
Next, ask each individual to select a feather that is a "good flyer", and a partner to collaborate with to turn their feathers into long-distance travellers with their combined efforts.

After everyone's feather has travelled a long distance, discuss the activity with the class. Try to define the qualities of feathers that were the best fliers. Explore the structure of these feathers further by deconstructing some of them in an analytical process.



PART II — PILLOW TOSS

Ask students to stand in a circle. Throw a feather-filled pillow from individual to individual, and across the circle to another person of their choice. Note the way that the pillow always makes a soft, soundless landing. This is due to its feather-filled interior, and the way that those feathers interact with the air, even when they are contained within a pillow. Observe how the feathers affect the pillow's speed in the air when thrown. The pillow arrives as a parcel which is tactile and flexible. It is also nearly soundless when dropped.



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PART III — BALANCING A PEACOCK FEATHER

Give each member of the class a long peacock feather from the dramatic, showy tail of a male peacock. Ask them to handle it carefully as they work through this activity, so that its form is just as beautiful and unbroken at the end of the activity as it was as they began.

Spread the class out, so everyone is standing at least 3 – 6 feet (1 m – 2 m) from one another.

Ask each student to stand the feather in the palm of their hand, and balance it on the tip of its quill. They should try to keep it upright for as long as they can, by moving their whole body to compensate as it responds to the breeze and threatens to fall off. Students will get better at this as they practice.

When everyone has had a chance to practice balancing their peacock feather, hold a contest to see who can keep their feather upright the longest. Discuss the techniques that seemed most successful.

When the activity is complete, allow each student to take their feather home as a memento, if possible. Otherwise, save them and use them again with another class. If the feathers get damaged, trim the quill and keep the 'eye' of the design. It's a shimmering (male only) display.

EXTENSIONS

- Research peacocks in art
- Make a collage with peacock feathers
- Read fiction and non-fiction books about peacocks and add them to your school's library.



PLAYGROUND MATHS: THE 100 SQUARE

AGES

5–10 years old

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© SHARON DANKS

To create an engaging playground culture, outdoor games need to be taught and the playground re-imagined as the largest classroom. The 100 Square is a versatile tool that can be used for engaging maths lessons and games, organized by teachers in connection with their curriculum. It can also provide also a framework that children can use themselves at recess to make up their own games, exploring numbers and spatial relationships on their own. 100 Squares can be temporary, created using movable carpet tiles (described below), or painted onto the playground.

MATERIALS

- 101 carpet tiles (6”–12”) with a rubberized bottom surface
- White emulsion paint (latex paint)
- 1–3 paint brushes, ½” wide
- Tailor’s chalk for tracing the numbers
- Number stencils, with size carefully selected to allow a 3-digit number to fit on a carpet tile
- Cardboard frames that cover the outer edges of the carpet tiles, 1” wide, all the way around. This temporary “mask” ensures that the edges of the tiles remain unpainted.

PREPARATION

Place each carpet tile on a firm surface, with the cardboard frame on top of it and a number stencil carefully positioned inside the frame. Use the tailor’s chalk to draw around the stencil, inside the frame, so that the number is lined up in the correct unit position. (Single digit numbers aligned to the right hand side.) Put one number on each tile, from 0 to 100.

Once each number has been chalked and its alignment checked, then it can be painted in with the brush and emulsion paint. Set each carpet tile aside to allow the paint to dry. The 100 Square is ready to be used after all of the paint is dry.

DIRECTIONS

Bring the numbered carpet tiles onto the school grounds with the class, in a paved (or unpaved) area. Place all of the numbered tiles (1-100) on the ground in a grid with 10 columns and 10

rows. Carefully arrange each tile so that every edge touches, and every number is strictly in line, both horizontally and vertically. Now, the 100 Square is ready to be used for mathematical games.

MATHS ACTIVITIES TO USE WITH A 100 SQUARE

Ask all of the students in the class to each find a square at random and stand on it. Then, ask each one to call out the number they are standing on, in sequence.

Ask all of the students to walk off their square and then walk back onto the grid again, standing (as a class) so that no numbers are skipped, beginning at #1. Ask each student to call out their number in order.

Ask the class to rearrange themselves on the numbers, beginning with #2 so that every other number is missed. Discuss the pattern the class makes with their bodies. Now rearrange the class so that they demonstrate the odd numbers. (Start at #1, and skip every other tile.) Thus, they have seen both even and odd numbers. This should prompt students to invent some odd and even number activities or vocal ideas.

This can progress with the times tables. For instance, every child to can stand on every third tile. This produces an interesting pattern, as does every times table. Can the children predict the pattern?

Once the teacher is used to this style of mathematics, there should be no difficulty in using the 100 Square for many more inventive mathematical games of increasing complexity. The tiles can also be rearranged into a linear configuration to explore number sequences with a new perspective.



THE AMAZING RAG: STRUCTURE WRAPPING AND WEAVING

AGES

4–18+ years old

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This practical activity is about seeing the ordinary in a new light. It is inspired by the work of artists Christo Vladimirov Javacheff (1935 –) and Jeanne-Claude (1935 – 2009), who collaborated to wrap monumental elements of landscapes around the world with brightly colored fabric, to temporarily change the way the public experienced that environment. In this activity, students will select elements of their school ground landscapes to wrap with fabric, and consider how that changes their perspective on the ordinary forms that they see every day.

MATERIALS

- Large quantities of fabric and other textiles, cut into strips roughly 2”–3” wide and 12”–30” long. Longer lengths are superior and are easy to tie into place by knotting the ends.
- Fixed elements of the playground that can be temporarily wrapped (e.g. playground equipment, fence posts, sturdy trees, benches, tables, etc.)
- Moveable elements on the school ground that can be temporarily wrapped (e.g. a bicycle, a wheelchair, a dining chair, a wheelbarrow, a group of water bottles, a volunteer, a shovel/spade/ho as a group of 3 objects that can be wrapped together, etc.)
- A camera, to record the temporary masterpieces in their landscape settings

BACKGROUND

Art gives artists an opportunity to express their views of the world and make social and political commentary. It is also a pathway to further expression about belief. This activity, Amazing Rags, is an art exploration that emphasises the shapes of the objects that are wrapped, but it also makes an attempt to see the objects in a different light.

For example, the strips of fabric used for wrapping a bicycle might be positioned to define its main frame with shades of red. Other bits of the machine’s geometry might then be expressed differently. Sorting out an object’s defining characteristics,

thinking about them, and identifying meaningful relationships or themes that emerge is part of this exercise. In the case of a bicycle, that might relate to its positive impact on the health of people and their environment. Those ideas might suggest certain colours or patterns to the students, who can then layer those meanings into the way they wrap the object.

Similarly, wrapping garden implements may also imply a message since growing vegetables and flowers, and caring for the soil, emphasises awareness about the flow of nature. This might suggest explorations in a pallet of greens and browns.

DIRECTIONS

Bring the class out into the school ground. Explain the activity and give any guidance about what may or may not be wrapped. Divide the class into pairs or small groups and let them select the objects they will wrap. Ensure that the scale of the selected objects is appropriate for the quantity of available fabric.

Tell the students how much time they will have for their wrapping and weaving work, and set them to their task. After the time is up, reconvene the class for an art tour to visit each of the newly wrapped objects. Invite each group of artists to talk about their process and the outcome. Photograph each wrapped sculpture after the artists have presented it.

Note: Objects on the school ground may be left wrapped for a short period of time (a few days) or unwrapped at the end of the class period so that another class may reuse the materials and have their own art experience.



BUBBLES

AGES

4–10 years old

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© SUSAN HUMPHRIES

Bubbles light up even the most interesting playground. In a dreary playground, with too much pavement and not many things to do, they are magic. Bubbles are a wonderful material for recess play time and are useful, engaging educational resources to increase understanding of the spectrum of colours in natural light, the properties of air (volume and currents), and the properties of materials (liquids, gases, surface tension).

MATERIALS

- Bubble solution mixed with this ratio, and allowed to rest overnight: 6 cups water + 1 cup high quality dish soap + 1 to 2 TBL glycerin (or ½ cup corn syrup)
- Unbreakable bowls, 1 per person
- 1 large bowl or baby bath in which to mix the bubble solution
- Plastic tubes with a narrow diameter or natural straws with a wide diameter, 1 per person
- Wire clothes hangers wrapped with cloth, 1 per person
- Plastic cones, used to hold industrial spools of thread, 1 per person. Clean, worn out socks, cut into rings to place around the wide end of each plastic cone.

PREPARATION

Bend a wire clothes hangers into a circle, with the hook as a handle. Wrap the circular wire with a strip of flannel or fleece cloth to help soapy water adhere to the metal ring. Add a sock-rings to the end of each plastic cone, for the same purpose. Repeat this process to have enough wire circles and plastic cones for each child to experiment with.

DIRECTIONS

Step outside onto the playground with the class and gather in a place that is paved and spacious. Divide the class into circles with six students each. Each student should have: 1) a short tube for blowing, and 2) a bowl of soapy water. Their aim is to build a tower of bubbles in the centre of the circle on the

pavement by blowing into the bowls so that bubbles cascade into the centre and build on each other to become a hill of foam. Give the groups 5 minutes for this activity, so they can use their soapy water to maximum effect.

For the next ten minutes use the plastic cones to create bubbles that are airborne. Ask half the members of each group to blow bubbles and the other half to help a partner to keep their bubbles airborne by blowing underneath them. Success is a bubble which crosses the area the partners are working in or disappears beyond the school's roof! Change roles only after a timed five minutes.

Refill the individual bowls of soap, or turn the class's attention to a shared baby bath of soapy water. Give each student a wire hanger bubble tool, and demonstrate how to dip it to create a thin film across this much larger surface. Guide the children to see through the film of soap and water and focus on the people/trees/clouds on the other side. Draw their attention to the way the breeze causes a shimmering effect and point out the spectrum of colour on the skin. Enjoy the wobble effect which happens when the skin responds to pressure. Set the students free to try what the teacher has demonstrated with their own wire hangers. Encourage them to spread out and fill the paved playground with floating bubbles. Allow ten minutes for this activity.

Gather the class. Close with a short discussion. Ask the students to share their experiences, observations, and feelings.

Note: It is important to keep the bowls of soapy water on the pavement since it may kill the grass or other plants if spilled. Take unused soapy water back inside after this activity. Do not pour it into the school ground landscape or stormdrain.





Green Schoolyards America

Green Schoolyards America is a national organization that seeks to transform asphalt-covered school grounds into park-like green spaces that improve children’s well-being, learning, and play while contributing to the ecological health and resilience of our cities. We believe that all children have a right to go to school in vibrant, living schoolyards that help them develop their curiosity, their sense of adventure, a healthy lifestyle, and an understanding of their own ability to be changemakers in the world.

Green Schoolyards America is working to change the norm for school ground design, use, and management so that all children and youth will have access to the natural world, every day, right outside their classroom door.

Our work includes:

Research. We conduct research that connects children’s well-being and academic achievement to the ecological health of their school ground and neighborhood environments.

Policy. We advocate for policies that enable school grounds to become dynamic, multi-use, nature-filled public spaces that benefit children and the environment at the same time.

Support. We partner with school districts, public agencies, and other colleagues to develop city- and state-wide living school ground initiatives. We also offer public presentations, professional development, and publications.

We invite like-minded professionals and organizations to partner with us to nurture and grow the national and international movements to green school grounds for all children. Please visit our website for more information:

greenschoolyards.org

Resources for greening your schoolyard

- Subscribe to our newsletter: bit.ly/GSA-SignUp
- Visit our online resource library: bit.ly/GSALibrary
- Read *Asphalt to Ecosystems*, by our CEO, Sharon Danks, for inspiring examples of green schoolyards around the world. Available from New Village Press: bit.ly/A2E-Danks
- Join our Facebook page: bit.ly/GSAFBk1
- Follow our LinkedIn page: bit.ly/GSALI
- Encourage your city or state government to adopt a Living Schoolyard resolution: bit.ly/CaACR128
- Encourage your school district to adopt a Living Schoolyard vision and policy: bit.ly/OUUSD19-GSY
- Please contact us at info@greenschoolyards.org if you’d like to bring living schoolyards to your school district or region.





IMAGINE. In one corner of the schoolyard, a small group of children play together at the edge of a puddle, learning about the water and its inhabitants, stretching their creativity, and building friendships. In another, a teacher supervises as students collect natural materials, improving their fine motor and numeracy skills as they arrange their treasures in patterns. Across the yard, older youth are running and jumping, testing, and growing the limits of their physical abilities, then sitting quietly under a tree, reflecting and releasing the stress of the day. After school, a family or community group uses the grounds for a performance and a party—celebrating their community in a space that they helped to envision, create, and maintain.

This is the spirit of the green schoolyard movement and the vision that many schools embrace when they transform their traditional asphalt- and grass-covered grounds into “living schoolyard” environments that feel like parks.

We hope the experiential outdoor learning ideas in these pages will encourage your school to take students outdoors regularly and to use your school grounds to their fullest year-round.

Two companion *Activity Guides* with additional school ground ideas are also available for free on our website.

It's time to go outside!



green schoolyards america
greenschoolyards.org