

EXPLORING THE NIGHT WITH YOUR STUDENTS

Being outdoors at night without artificial light sources is becoming something that those of us who live in urban areas do less and less. In fact, even in rural areas, many people either no longer live on their farms, or they illuminate them with powerful yard lights. Learning to simply “be” in nature in the dark may be a way of learning how to have a smaller environmental footprint, and may open both you and your students to a new way of understanding our interconnectedness.

There are a number of ways you and your students can spend time together outdoors at night. The way(s) you choose will depend on your goals. As this document outlines a variety of activities, not all of which are compatible with one another, it is important that you spend time planning with your objectives in mind. Think about which areas you would like to emphasize (experiencing the dark, star-gazing and legend-sharing, animal adaptations, etc.) before beginning to organize your hike(s).

****SAFETY CONSIDERATIONS****

As hiking in the total dark (no flashlights or other light sources) is the best way to experience the night with your students, it is essential that you are familiar with the trail before you take your class outside. The students also need to be reminded to be sure they are dressed warmly enough (especially important is having one’s head covered), to walk more slowly than they are used to walking in the daytime, and to use handrails on the stairs (being especially cautious if they are wet, frosty, snowy, or icy).

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Several detailed formats to help you lead your own hike ... read through and take your pick!

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- detailed resource that aligns with the *Minnesota Profile of Learning*

E. The Magic of Night Hikes ----- p. 35
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These are not compatible with a silent night hike, but can be lots of fun (i.e. do them on another night).

III “Eyes at Night” Hike ----- p. 44

This activity might work very well on your first night at camp, as it would serve to introduce some of the night creatures that may be about during your night hike, and it may also help the students become more accustomed to being in the dark (helping to make a hike on the second night more successful).

Leading a Night Hike at Brightwater

Marcia Klein (306) 683-8323

Brightwater Science and Environment Centre. Saskatoon Public School Division,
Saskatchewan

Group students mentioning the 'Group Up' phrase which means to come together as quickly as possible. Teach the students my voice so I do not have to raise it. Discuss the beauty of the night world mentioning that our eyes have cones for color for the daylight and the rods at the back of the eyes work more during the night. Discuss some of the fears (wild animals, getting lost, darkness) and provide reassurance as appropriate. Celebrate the beauty of the nighttime environment by helping participants to trust each other and this element.

Play the 6th Sense game.

Partners stand about 5 metres apart. One plays the role of the predator that will sneak up on the prey. The prey needs to guess when the predator is approaching. Prey stands with both arms outstretched like for frozen tag. The challenge is to pull in arms before the predator tags one of them. Sense used include the sense of hearing but not sight because eyes are closed and prey is not facing predator. Animals use a sixth sense that is a deep knowing that something is there. Then they need to make a decision whether to stay hidden or flee. Pulling in arms too many times would suggest that the animal is using a lot of energy to flee from possibly nothing at all.... Call the group back in after each partner has played both roles. Encourage silence at the outside as the squeals of capture escalate.

Lucky Stone

Take a walk about on the trail encouraging no talking. Intersperse adults between kids with an adult 'sweep' at the back. Some kids might benefit from holding a lucky stone passed out to hold on to help pass a slight feeling of nervousness. Walk along the trail just to get used to walking in the dark.

Vision Check

Stretch your arms in front of your eyes and the slowly move them until you cannot see them with your periferal vision. Note how far you arms move. Then try it again with your arms outstretched but your fingers wiggling. Generally the motion is detected by your periferal vision more easily. Our light sensitive rod cells (the ones that are used for night vision) detect the movement and images in dim light (p. 36 – Keepers of the Night).

At a long point in the trail (after the staircase around the slump zone), pass about sit upons (Blue pieces of foam pad) and sit silently for a few moments. Group up together and share observations and experiences.

Star Gazing - nice to do in the open area by the old chimney

Continue the walk about to a clearing where constellations can be pointed out such as the big dipper, Casseiopia, Orion, Leo, Pleides sharing stories about each. Excellent resources about the legends are listed in the reference list. Remember that out of respect,

Indigenous legends are only told when the flowers and plants do not tell their stories – during winter.

Wintogreen Sparks – do this at the top of the road before you see the lights from the cabins.

Pass out the Wintogreen lifesavers to each open hand. On command, they can put the candy in the mouth and chew with mouth open to see sparks. It is fun to work this up with a preamble beforehand such as the stars within us or too bad we did not see stars but we have another chance. Sometimes kids want to know why/ how this phenomena happens. Sometimes there are just some neat experiences that are like magic. The kids can brainstorm reasons or they can check the following website – [not sure if one exists but will try to find one....].

Walk back to the chalet quietly or with hands linked in a long chain (like red rover) lead by the only person who has eyes open, the leader. This can be a peaceful way to end the hike. Debrief the experience sharing reasons for walking in the night generated by the walkers. As we walk in the night, we are more reflective and seek each other for mutual support while discovering a foreign world. Walking silently as described in the book, *Sharing Nature with Children* (new edition), page 146 as well as 156 speaks of the sense of harmony and deeper connection with nature, life and our self through a growing awareness of the night world.

Sources of activities and Stories:

Keepers of the Night: Native Stories and Nocturnal Activities for Children by Michael J. Caduto and Joseph Bruchac. 1994. ISBN 1-895618-39-8

Keepers of the Earth: Native Stories and Environmental Activities for Children. by Michael J. Caduto and Joseph Bruchac. 1989. ISBN 0-920079-57-1

Knowing the Outdoors in the Dark by Vinson Brown. 1972. Lib Con # 71-179605

They Dance in the Sky: Native American Star Myths. 1987 by Jean Guard Monroe and Ray A. Williamson. ISBN 0-395-39970-X

When the Morning Stars Sang Together. By John S. Morgan. 1974. ISBN 0-7725-5079-4

Sharing Nature with Children by Joseph Cornell. 1998. ISBN 1-883220-73-4

Tapes –

Seeing in the Dark: Interpreting the Nighttime Environment

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A Window to the Night

Night and Day are relative experiences that vary depending on the season and the geographical location in which you find yourself. Night in the winter in the Yukon has a different meaning than in the mountains or the prairies.

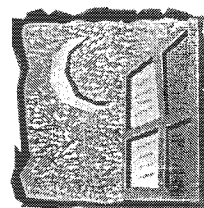
During the night, scents come alive as the primrose, cactus and honeysuckles spread their fragrances to encourage pollination by moths and bats. Porcupine graze on Poplar or Birch balancing on branches. Scent marks left by passing coyotes or beavers proclaim

boundaries 24/7 while other animals sing of their territories in ponds and other wetlands. Migration, often occurs at night as flocks of birds and other animals follow the moon. Many day flight birds feed by day and fly by night to avoid predators.

For safety and to prepare for some great interpretive hike stops, pre-visit the trail you will wander with your group. Check out places animals seem to gather as a possible stop.

Bring a flashlight covered

with a red balloon as the rods in eyes are not as blinded by red light. Also bring a napsac of 'sit-upons' - cup up pieces of blue foam sleeping mats (thanks Simone Forget!) for sitting quietly along the trail in a solo meditation for a few minutes. Other items to pack include binoculars, blindfolds, wintogreen life savers, small first aid kit.



Look Up!

When I Heard the Learn'd Astronomer

When I heard the learn'd astronomer,

When the proofs, the figures, were ranged in columns before me,

When I was shown the charts and diagrams, to add,

divide, and measure them.

When I sitting heard the astronomer where he lectured with much applause in the lecture-room,

How soon unaccountable I became tired and sick,

Till rising and gliding out I wander'd off by myself,

In the mystical moist night-air, and from time to time,

Look'd up in perfect silence at the stars.

<http://www.liglobal.com/walt/poetry.shtml>
By Walt Whitman
(1819-1892)

Fostering Trust in the Night

Starting the Hike

Group students mentioning the 'Group Up' phrase which means to come together as quickly as possible. Teach the students your voice so you do not have to raise it. Discuss the beauty of the night world mentioning that our eyes have cones for color for the daylight and the rods at the back of the eyes work more during the night. Discuss some of the fears (wild animals, getting lost, darkness) and provide reassurance as appropriate. Celebrate the beauty of the nighttime environment by helping

participants to trust each other and this element.

Lucky Stone

Take a walk about on the trail encouraging no talking. Intersperse adults between kids with an adult 'sweep' at the back. Some kids might benefit from holding a lucky stone passed out to hold on to help pass a slight feeling of nervousness. Walk along the trail just to get used to walking in the dark. Then play some of the suggested games along the way.

"If a child is to keep alive his [her] inborn sense of wonder, he [she] needs the companionship of at least one adult who can share the joy, excitement and mystery of the world we live in."

- Rachel Carson, 1965 *The Sense of Wonder*

Night Games along the Way

Play the 6th Sense game

Partners stand about 5 metres apart. One plays the role of the predator that will sneak up on the prey. The prey needs to guess when the predator is approaching. Prey stands with both arms outstretched like for frozen tag. The challenge is to pull in arms before the predator tags one of them. Sense used include the sense of hearing but not sight because eyes are closed and prey is not facing predator. Animals use a sixth sense that is a deep knowing that something is there. Then they need to

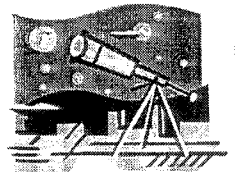
make a decision whether to stay hidden or flee. Pulling in arms too many times would suggest that the animal is using a lot of energy to flee from possibly nothing at all... Call the group back in after each partner has played both roles. Encourage silence at the outside as the squeals of capture escalate.

Source: Knowing the Outdoors in the Dark Page 161

Do a Vision Check

Stretch your arms in front of your eyes and the slowly move them until you

cannot see them with your peripheral vision. Note how far you arms move. Then try it again with your arms outstretched but your fingers wig-



Exploring the Night Sky

gling. Generally, the motion is detected by your peripheral vision more easily. Our light sensitive rod cells (the ones that are used for night vision) detect the movement and images in dim light. Source: Keepers of the Night Page 36.

Reach for the Stars

Find a clearing where constellations can be pointed out such as the Big Dipper, Cassiopeia, Orion, Leo, Pleiades sharing stories about each. It is fascinating to compare the stories in different regions as well as interpretations of the same constellations by different cultures. Many people see the one

known as the big dipper as a bear or a fisher. Excellent resources about the legends are listed in the list on page four. Out of respect, Indigenous legends are only told when the flowers and plants do not tell their stories - during winter. Obtain permission from the group before telling a story out of sea-

son, even from a book. Watch for Aurora too.

Often students can observe the straight passing of a satellite while viewing the stars. Check out web for more current stellar news.



Searching for Satellites!

See the Sparks Fly!

Wintogreen Sparks

Pass out the Wintogreen lifesavers to each open hand. On command, they can put the candy in the mouth and chew with mouth open to see sparks. It is fun to work this up with a preamble beforehand such as the stars within us or too bad we did not see stars but we have another chance. Sometimes kids want to know why/ how this phenomena happens. Sometimes there are just some neat experiences that are like magic. The kids can brainstorm reasons or they can check the following website –

<http://www.towson.edu/~sweeting/wg/candywww.htm>
<http://www.dearanswerlady.com/html/lifes.html>
<http://www.geocities.com/RainForest/9911/tribo.htm>

Closing the Hike

Walk back to the chalet quietly or with hands linked in a long chain (like red rover) lead by the only person who has eyes open, the leader. This can be a peaceful way to end the hike once the group settles in to walking quietly guided by their peers. Debrief the experience exploring reasons for walking in the night generated by the walkers.

As we walk in the night, we are more reflective and seek each other for mutual support while discovering a somewhat foreign world. Walking silently as described in the book, Sharing Nature with Children (new edition), page 146 as well as 156 speaks of the sense of harmony and deeper connection with nature, life and our self through a growing awareness of the night world. A beautiful experience!

Super Night Games

Mission Impossible is a blast! Play it in a field where it is on top of a hay bale or other raised object. The beam of light on the incoming player eliminates the player from that round. Hiding behind hay bales, and other obstacles, players to make it back to the centre before being tagged by the light beam. Usually 'it' needs to count to 60 to give players time to run away and hide.

Searching for Night Eyes

Plant wooden animal silhouettes along the trail with eyes painted on by luminescent paint/ reflective paint or stickers. Beaming a flashlight on the eyes will reveal the animal. Keep track of how many eyes you noticed. Painting a letter on the silhouette may also be a fun treasure hunt to unscramble at the end of the trail.

Bat and Moth

Read *Moth the Fire Dancer* in *Keepers of the Night* before your hike or better still, storytell during the hike. Stand in a clearing in a circle to form a habitat. Choose three or four moths to fly around inside the circle. Blindfold a bat who will call 'Bat' to which the moths respond 'moth'. Once caught, they decompose in the habitat. Then a new group of moths and bats move in. Other great games include Hog Call, Sardines, Flags, and predator prey games. Email me for more info on these games.

Practice Makes Perfect

Spending time outside with your students will increase their comfort of learning in the outdoor classroom. Consider taking a walk in the playground at school during the day to try to observe birds, plants and other interesting features. Notice shadows, the sun, the moon and possibly even sun dogs on a cool winter day.

Practice commands for grouping the students outside. (Raise arm and count down 3,2,1,0 to gather the students for the next activity or some other respectful gesture or voice command).

Spend time sitting under a tree or some other structure to foster comfort being in one place for a period of time. (1 minute +)



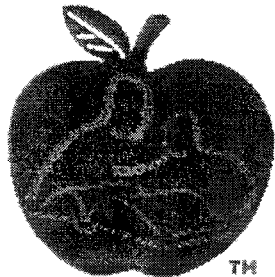
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'Learning naturally'

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brightwater](http://www.spsd.sk.ca/brightwater)]



**Saskatoon
Public
School
Division**

Through a partnership with the Saskatoon Public School Division and the Salvation Army, students in grade six and seven participate in a three day residential out-of-school education experience at Brightwater Science and Environment Centre. The camp is located 15 km south of Saskatoon on Highway 219 in a sand-based habitat of Aspen bluffs and patches of native prairie on a small creek (Brightwater/ Beaver Creek) near the South Saskatchewan River. Since 1990, the Brightwater Program has provided students with an opportunity to become more aware and appreciative of nature, wildlife, the land, water and air enriched through the expertise of specialists. Grade 11 Biology 20 students complete a component of their ecology program at the adjacent School Division land.



Sources for Activities and Stories...

Keepers of the Night: Native Stories and Nocturnal Activities for Children by Michael J. Caduto and Joseph Bruchac. 1994. ISBN 1-895618-39-8
Check out the excellent stories with interpretive activities, games and scientific information to help explore a theme. See page 36-41 for more sensory activities (smell a banana while blindfolded and then taste it, follow a noise trail created by the leader)

Keepers of the Earth: Native Stories and Environmental Activities for Children, by Michael J. Caduto and Joseph Bruchac. 1989. ISBN 0-920079-57-1

Knowing the Outdoors in the Dark by Vinson Brown. 1972. Lib Con # 71-179605 This is an excellent resource with information about good animals.

They Dance in the Sky: Native American Star Myths. 1987 by Jean Guard Monroe and Ray A. Williamson. ISBN 0-395-39970-X

When the Morning Stars Sang Together. By John S. Morgan. 1974. ISBN 0-7725-5079-4 More stories.

Sharing Nature with Children by Joseph Cornell. 1998. ISBN 1-883220-73-4 Excellent outdoor learning book.
Sharing the Joy of Nature by Joseph Cornell.

Rekindling Traditions: Cross-Cultural Science and Technology Units—The Night Sky by Shaun Nagy/ Glen Aikenhead, Ed. http://capes.usask.ca/ccstu/units/night_sky.html

Audio recordings –
A Guide to Night Sounds NorthWord Nature Guide.

Video—Stars and Constellations. National Geographic Society 1993 25 minutes. Producer Roger Brown.

Follow the Moon by Sarah Weeks ISBN 0-06-024443-7



Your Brightwater Night Hike – “Seeing with Different Eyes”

Dennis (Caswell School, 683-7160) and Kathrine (244-4889) Flaherty

While our first night hike was led by Marcia Klein (to whom we owe a debt for her knowledge and inspiration), “our” hike has evolved in a somewhat different direction. In addition to the opportunity to experience Brightwater in a unique way, and perhaps to hear or see nocturnal wildlife, the scientific content we discuss is organized in relation to three main areas:

- (1) night vision and various animal adaptations
- (2) constellations and other aspects of the night sky, including the “supernova simulation” with WintOGreen Lifesavers™, and
- (3) an example of the interconnectedness of all life.

The typical chronological format is discussed below, with Notes at the end to give you background and content.

When we lead a hike, we begin by spending 20-30 min. inside, as outlined below, then spend about 45 min. (per hike) outside on the trail. If the class has been divided into two groups, the entire night hike takes about 2 or 2-1/2 hours. The time can vary quite a bit depending on the presence or absence of wildlife, the temperature, and the co-operation and readiness of the students (waiting for them to retrieve warmer clothing can be very time-consuming and disruptive to the flow; we therefore suggest that the students prepare themselves right after supper so they will be ready when the time comes).

We have found the most successful hikes are those which occur following teacher-preparation. We encourage teachers to discuss the prospect of the hike with the students before ever leaving the school, going over expectations such as not bringing along flashlights and maintaining silence throughout the hike. It is good practice to use a gym period (covering any windows with black paper) to become accustomed to being in the dark and to walking single file, and to have an opportunity to observe how one’s night vision improves the longer one is in the dark.

At camp, we like to talk with the students in the evening before we head out on the trail. We discuss the reasons why we think this is a worthwhile activity. These include:

- Experiencing the creek trail in a way that’s different from the way we experience it in the daytime
- Possibly facing one’s fears or discomfort in the dark (after all, for many thousands of years, being out and about in the dark was a very normal part of life); a brief discussion of what may account for any rustling in the bushes (mice, birds, ground squirrels and other small creatures being the most likely candidates) helps put night sounds in perspective
- Having an opportunity to hear or see nocturnal wildlife (no guarantees!) such as beavers, coyotes, and owls, among others
- Experiencing the power of teamwork, as everyone works together to help the experience be the best it can be
- Employing our underused senses (night vision, senses of hearing and smell, also sense of touch as we feel along the trail with our feet)

- Maintaining complete silence as opposed to simply quiet behaviour (with a bit of practice inside before going outside)

We also tell the students what we know about vision generally (night vision in particular) and we discuss the eye adaptations that nocturnal animals have (*see Notes – “A” - at end*).

After flipping the breaker (labeled ‘Cabins’ and found in the cleaning/supply closet to the rear of the kitchen) in order to turn out most of the exterior yard lights, we assemble in front of the dining hall. As this is not a vigorous activity, time sometimes needs to be spent gathering extra layers of clothing from the cabins. As the circuit breaker will also douse the lights in the cabins, be careful not to flip the breaker until all students have returned (as indicated, it is preferable if this has been done prior to the introduction). Students sometimes need an extra reminder to leave all cameras and flashlights behind. If there will be two groups going on the hike, **the non-hiking group must remain inside the dining hall at all times** as even low voices will carry amazingly well and this can intrude on and spoil the hikers’ experience (the fact that there is no power in the cabins can assist in this!). The non-hiking half of the group also needs to be doing a complementary activity, such as writing in journals, playing quiet environmental games, being read to by an adult, etc. One last reminder is issued about not ruining one’s eyes’ adaptation to the darkness by looking at artificial lights (or a bright moon!).

Our hike along the creek trail begins at the top of the stairs just beyond the firepit. One adult leads the group and another is the “gatekeeper” at the top of the stairs and is the last in line. Any other adults should be evenly spaced among the students. The group proceeds in single file, with each person being silently motioned to start when the preceding person is just past the bottom of the stairs and still in sight. **Students must not walk with a partner.** (If anyone feels uncomfortable or unsure, they may wait and walk with the adult at the end of the line.) Instructions should already have been given that **students are not to catch up to (or overtake) one another.** If someone thinks they hear or see something, or if they just wish to stand for a moment in silence, whoever is following them needs to also stop just as soon as they realize what is going on, and re-establish the distance between them once the person in front starts walking again. Students need to be reminded that, because they can’t see as well in the dark, they need to walk more slowly than they would in the daytime, letting their feet feel the way, and also trying to walk with a very quiet tread. **One of the reasons for going on a night hike is to have an experience that is different from a walk in the daytime; therefore one’s behaviour (walking alone and in total silence) must also be different.**

We walk about halfway into the clearing where the stone fireplace is. Everyone must wait in silence for the last in the group to arrive. Once there, we often point out some constellations and other heavenly bodies and star groupings (using the laser pointer which is in a box in the top drawer of the filing cabinet in the office) if they are visible. Some legends related to the stars can also be shared (remembering that First Nations legends should only be shared when the ground is frozen). (*See Notes – “B” - at end.*) *There is also a “Night Sky” kit available through CMC if this is a particular focus for you.

As a follow-up to this “sky talk”, we like to share the “WintOGreen Lifesavers™ experience” as a way of simulating a supernova. We don’t mention that this will be part of the night’s events (in fact, we simply tell the students beforehand that we will do “a couple of activities” once we are in the clearing) and, if the class is divided into two groups, we ask the first group to say nothing to the second group so as not to spoil the surprise. (See Notes – “C” - at end.)

We also try to underscore the interconnectedness of all life, past, present, and future, by briefly discussing the composition of the air that we breathe and the part that the inert element argon plays. For this, we thank Neal Anderson, who himself credits David Suzuki for this particular perspective. (See Notes – “D” - at end.)

We then prepare for the return walk. We follow the same procedure as on the outbound trip, with the exception of giving the students the opportunity to walk further apart (30-40 seconds). This time the preceding person should not be visible, so if someone does get close enough that they can see the person ahead of them, they are to stop and let them get out of sight once more. The silence must be maintained all the way into the dining hall. Time can be spent de-briefing and sharing once all have returned.

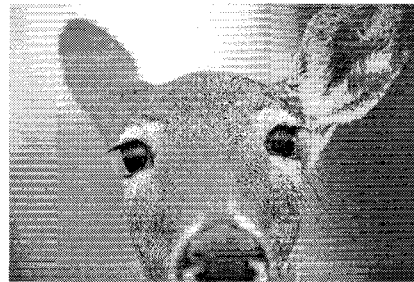
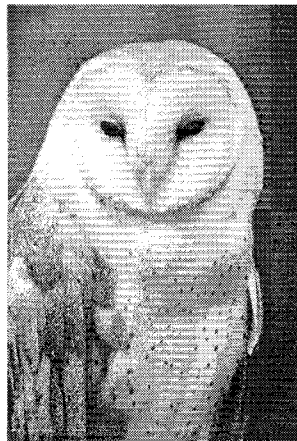


Notes:

A. Night Vision

- Retina is at back of eye and is where light is focused
- Retina contains minute light-sensitive receptors called rods and cones
- Rods allow one to see black, white, shades of grey, and movement
- Cones allow one to see colour and detail
- Humans evolved as diurnal (daytime) beings who needed the ability to distinguish colour and detail to find food (eg. distinguishing among berries); we therefore have many more cones than most animals
- Hawks (who hunt in the daytime) are an exception – they have more cones than humans, and therefore can spot their prey a very long way away
- Nearly all animals were originally nocturnal (active at night), so ability to see colour is relatively unimportant (even dogs were nocturnal until they were domesticated)
- Human eye has 6-7 million rods and 120 million cones
- Cones are scattered throughout human retina; there is also an area called the fovea which contains a concentration of cones of 150,000/sq. mm (animals lack a fovea)
- Humans' rods are around the edges of the retina, which explains why, in dim light, the harder you stare at something (and the more you are using the centre of your eyes) the harder it is to actually see (object tends to quiver or become more indistinct); this can be counteracted by focusing just a bit beside the thing you're trying to see – works well when looking at stars, too)
- Humans only use 10% of the light which lands on their rods
- In darkness, there is a build-up of the chemical rhodopsin (a protein) which helps rods be more sensitive to what little light there is; it takes 30 min. for this build-up to fully occur, which explains why it's important not to look at a light when you are trying to adjust your eyes in the dark
- What we have learned is summarized below, but you may want to find diagrams of the eye and or further information; some possible websites are:
 - www.regentsprep.org/Regents/physics/phys09/ceyes/sensing.htm
 - www.webvision.med.utah.edu/anatomy.html
 - www.lehp.org/diseases.htm

- **Animal adaptations** (not all animals have all of the following):
 - sensitive hearing and directional ear movement
 - larger eyes relative to body size (compared to humans)
 - bulging eyes (sometimes) for a more wide-angle view
 - many more rods than cones, and more rods than humans (eg. Tawny Owl has 56,000 rods/sq. mm)
 - some have a larger, thicker lens, allowing more light gathering
 - some have a larger cornea, allowing more light refracting
 - in owls, the image is focused nearer to the lens, giving maximum brightness
 - some have eyes on side of head (ex. cats and dogs) to give wider field of vision
 - owls have forward-facing eyes (more so than other birds) which are widely-spaced because face is flat; this allows them to be the best birds at judging distance
 - some pupils are slits instead of circular; this permits faster opening and closing and also allows them to open wider
 - owls' eyes are tubular rather than round and fill half their skull; this allows more light to enter and results in a relatively larger retina (100 times more sensitive in low light than humans)
 - tubular eyes can't be turned in their sockets, so owls have very flexible necks (can turn 270° horizontally and 90° vertically)
 - retinas in dogs, cats, deer, owls, etc. have mirror-like membrane called tapetum lucidum ("bright carpet" in Latin) that reflects the light that strikes them so it hits the rods a second time, maximizing the use of whatever light there is; this explains why these animals' eyes shine or glow when car lights, for example, strike them



B. Constellations

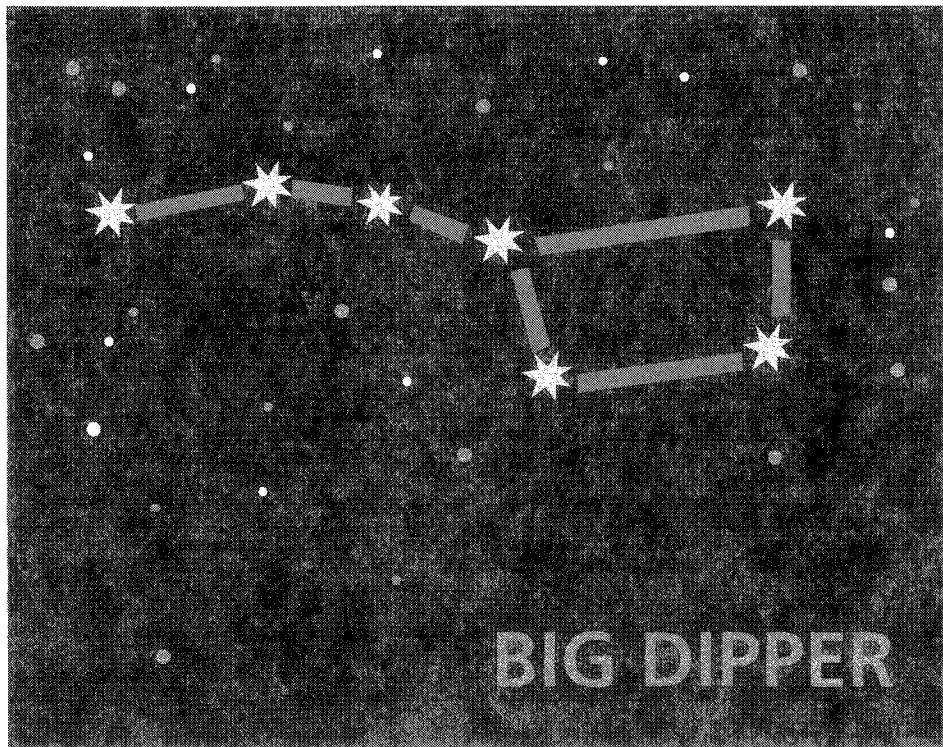
- While we are not experts in this area (indeed, on your other night at camp you may want to do some serious star-gazing with an astronomer/resource person) we can point out the Big and Little Dippers, the North Star, Cepheus, Cassiopeia, the Pleiades, and perhaps the Milky Way, Orion's belt and the planet Venus
- As previously mentioned, the laser pointer (in the top drawer of the filing cabinet in the office) works well and is very helpful
- Arcturus, a star found by following the handle of the Big Dipper to the left, is 33 light years away and is 30 times brighter than our sun ("follow the arc to Arcturus"); its light takes 40 yrs. to reach us!
- North Star (also called Polaris or Pole Star) –
 - star that earth's axis points toward
 - appears to be fixed (isn't quite) while all other stars appear to rotate around it – we use the analogy of spinning an open umbrella on which all the stars have been drawn, with the North Star being at the top of the handle/axis of the earth
 - is 50 light years away, which is 64,516 times further than the sun is from earth!
 - First Nations myth (we don't know specific origin) tells of a brave son Na-Gah who tried to impress his father by climbing the tallest cliff he could find. After many difficulties, he finally found himself on top of a very high mountain, looking down on all other mountains, but unable to get down. His father didn't want his son to suffer for his bravery, so put him at this top part of the sky, from where he could look down on everything forever
- This would be a great time for kids to share what they have learned from whatever research they may have done
- Useful websites:
 - www.hometown.aol.com/_ht_a/gca7sky/viewing.htm (lots of links, maps, and other information)
 - www.ms.essortment.com/northstarastro_rmdz.htm (info. about the North Star)
 - www.comfychair.org/~cmbell/myth/myth.html (mythology of constellations)
 - while not a website, Stan Shadick has a regular column called 'Skywatch' in the Saskatoon Sun

C. The “WintOGreen Lifesaver™ Experience”

- After star-gazing for awhile, we tell the students we’d like to try simulating a supernova. The dictionary defines “supernova” as: “a star that suddenly increases very greatly in brightness because of an explosion ejecting most of its mass. Supernovae are believed to be supergiant stars which have exhausted the hydrogen and helium fuel in their interiors. Gravitational contraction then leads to runaway thermonuclear reactions involving heavier elements, catastrophically disrupting the star and ejecting debris at speeds of up to a tenth of the speed of light and temperatures of hundreds of thousands of degrees. Within the resulting shell of material may be left a pulsar or black hole. Though frequently observed in other galaxies, only three supernovae have been recorded in our own Galaxy: by Chinese astronomers in 1054 (this formed the Crab Nebula), by Tycho Brahe in 1572, and by Kepler in 1604.”
- We then tell the students that we will pass out something that is perfectly safe to eat, and that they should hold it in their hands until, on the count of “3”, all are ready to put it in their mouths and (horror of horrors!) crunch and chew with their mouths open until it is all gone – while looking in a partner’s mouth and s/he into theirs!
- This works best if the lifesaver is as dry as possible (hence the importance of everyone waiting), so it may not work as well in humid conditions
- Can be tried at home in one’s bathroom with the lights out
- Must be WintOGreen Lifesavers™ (wintergreen oil necessary); a supply of these is in the top drawer of the filing cabinet in the office
- Phenomenon (students should observe bluish sparks) doesn’t necessarily have to be explained, but if you/the students wish, the science involved is given below (along with another useful website)
- “the enlightening experience you have when munching WintOGreen Lifesavers™ results from the fracturing of sugar crystals. This causes a blue-green light to appear, through a process called “triboluminescence” that’s related to the electromagnetic radiation produced when rocks are crushed in volcanic eruptions and to the “St. Elmo’s Fire” seen around ship masts before and during electrical storms.”
- A segment from the National Public Radio program “Earth and Sky,” quoted at www.geocities.com/Rainforest/9911, explains

that triboluminescence is a two-step process: "Step one happens when sugar crystals break -- they tend to split along planes with positive charges on one side and negative on the other. As the pieces of candy move apart, the charges want to get back together, so they jump across the air like tiny lightning bolts. Because WintOGreen Lifesavers™ are naturally fluorescent, now step two can take place. The 'lightning bolts' give off invisible ultraviolet light - which cause the fluorescent Lifesavers to give off their own visible fluorescent light. You may have seen something like this in mineral displays under black lights. The black light shines in the ultraviolet, causing the minerals to fluoresce, or glow. In the case of WintOGreen Lifesavers™, the fractured sugar crystals generate the ultraviolet -- and the wintergreen molecules absorb it. The result is that, as you chomp your candy, sparks fly."

- www.science.howstuffworks.com/question505.htm



D. Doesn't Argon Make You Wonder?

- The air we breathe is composed of Nitrogen (just over 78%), Oxygen (just under 21%), trace amounts of Carbon Dioxide, Neon, Methane, Helium, Krypton, Hydrogen, and Xenon, and just under 1% (0.934%) Argon
- Air also contains water vapour and dust particles
- Argon is inert (it does not react or combine with other elements) and it is colourless and odourless; even though there is so little of it in the air we breathe, there are 3,000,000,000,000,000,000 atoms of it in one breath!
- We are moved and challenged by the way David Suzuki talks about argon and our air. We think these thoughts graphically portray the interconnectedness of all life. Rather than paraphrase him (which we do when we share this with the students), we include the following excerpt from a speech he gave in Frankston, Australia in March 2004; the entire speech is available at

www.nnyn.org/videos/videos/David%20Suzukis%20Speech.pdf

“And I came to understand that we have phrased the problem the wrong way. There is no environment out there and we are here, and we have to manage our interaction with it. Aboriginal people are right. We are the environment, there is no distinction. We are created out of the Earth and we are made up of the four sacred elements: earth, air, fire and water. And now we are not speaking in a metaphoric or poetic way; they mean it in the most scientifically literal way. And as I began to re-examine all of the ways I look at the world and what they were telling me, I came to understand that science confirms what they say in the most profound way; they are right.

We are the Earth and we are created by the air, the water, the soil and the sunlight. We are born of Mother Earth. Now let me show you how science confirms this.

The moment everyone of us left our mother's body the very first thing we needed was a breath of air and from that point on we needed air 15 to 40 times a minute and we will need that until our very last gasp on our death bed, and yet we don't even think about it. Well, I guess if you thought about it air every time you took a breath you wouldn't have time to think of anything else. But I want you to think about air and our relationship with it. We suck it in with each breath. The air penetrates into the lungs. Our lungs are filled with about 300 million alveoli or little capsules. We need all of those alveoli to provide the surface area to come into contact with that breath of air.

If you flattened out 300 million alveoli onto this stage it would cover an area equal to a tennis court. So that's how much surface that is all wrinkled up into our lungs. Each alveolus is lined by a three-layer membrane called a surfactant. The surfactant reduces the surface tension so when the air comes in, it instantly fuses to the surfactant. Carbon dioxide rushes out of our bodies into the air and oxygen, and whatever is in the air you have breathed, rushes into our bodies. So the oxygen is picked up by the haemoglobin molecules in red blood cells and with each beat of the heart the oxygen then rushes to every part of our bodies.

When we breathe out, we don't breathe all of the air out. If we did that our lungs would collapse. About half of the air that's in our lungs stays in our lungs every time we breathe out. The point I'm making is this, you can't draw a line and say the air ends here, and I begin there; there is no line. We are the air, it's in us, it's fused to us and it's circulating throughout the body. We are air. And of course, the air that comes out of my nose instantly mixes in this room and goes straight up your nose.

And when I tell kids this, you see them going, oh wuh! I guess they think they have a bubble of air named Johnny or Mary. We are air, and because we are the air, the air that comes out mixes and connects with you. I am you and you are me; there is no separation. We are linked together through this matrix of air. Air isn't a vacuum of empty space, air is a physical substance that links all of us together; not just with all human beings, but links us with the trees and the birds and the worms and the snakes, and all of us are using that air. So air, I believe, should be regarded as a sacred substance. This is not something you can put dollars and cents value on, air breathes life into all terrestrial beings and air ought to be regarded as sacred.

There is a wonderful thought exercise the American astronomer Harlo Shapley did many years ago. He said: 'I want to follow one breath of air and see what happens to it.' How do you do that? Twenty-one per cent of the air is oxygen. The reason we breathe air every minute of our lives is we need the oxygen, right? You breathe it in and the oxygen fuels our metabolic fires, so if you take a breath of air in, oxygen rushes into your body and a lot of it never comes back out. Seventy-eight per cent of the air is nitrogen; nitrogen goes into your body. Some of it reacts, it's not nearly as reactive as oxygen, but some of it reacts and doesn't come out. One per cent of the air is an element called argon, and if you remember your chemistry lessons from high school, you know that argon belongs to a class of elements called the noble gases.

They are noble because they are so bloody snooty they won't touch anybody else, they do not react chemically with anything else, and they are chemically inert ... kind of like CFC's. So you breathe air in, argon goes into your body. You breathe the air out and the argon comes right back out. So argon is a very nice marker for that breath of air, okay? Through argon we can follow the fate of that breath of air. How many argon atoms are there in a breath of air? Shapley calculates that there are three times 10 to the 18th power; that's three followed by 18 zeros. You can take my word for it, that is one heck of a lot of argon.

Okay. So, let's follow one breath that comes out of my nose and imagine what happens to it. Through convection currents within a few minutes after that one breath at three times 10 to the 18th, atoms begins to mix in the room. Within minutes, every one of you is breathing gazillions of argon atoms that were once in my body. But the doors are open; out goes that argon and across Frankston, across Australia and around the world. Then according to Shapley, one year later if we came back into this room, every breath you take would have about 15 argon atoms from that one breath we took a year ago.

So on that basis, Shapley calculates every breath you take has millions of argon atoms that were once in the body of Joan of Arc and Jesus Christ and every breath you take has millions of argon atoms that were in the bodies of dinosaurs 65 million years ago. That every breath you take will suffuse life forms for as far as we can see into the future.

So air, surely air, connects us not only to all living things today but connects us to the past and through into the future. Air should be regarded as a sacred substance. We boast that we are intelligent and we are clever and we think we are so smart. What intelligent creature, knowing the role that air plays in our lives and in all terrestrial creatures' lives, would proceed to use air as a toxic dump and think it is going to go away?

Air is a sacred substance that gives us life and our activity now is contributing to that thin layer that gives us life. We think of it as stretching up to the sky; well forget it. You know, if any of you saw my series 'The Sacred Balance' on SBS recently, I interviewed Julie Payette, a Canadian astronaut, who says that you sit in a capsule 400 kilometres above the Earth, and you are going around the earth every hour and a half, 16 times a day. You see a sunrise and a sunset and every time you are seeing a sunrise and sunset you think you see that thin, thin, thin layer just at the surface of the earth and that's the atmosphere and that's it; it's about 10 kilometres deep.

If you reduce the Earth to the size of a basketball, the air, the atmosphere, would be thinner than a layer of Saran Wrap, and that's what gives life to all of us and that's what all of our engines, every time you start your car, we are breathing all of that stuff that's in the air. I figure that at my age I have taken at least 315 million breaths. I have taken half to two litres of air into my lungs and filtered whatever is in it. We are the air and whatever we do to the air we do to ourselves. And when you look at it that way then a great deal of the way we are behaving is simply unacceptable.

We are the air, we are abusing ourselves because we are abusing the air that gives life to us and the most sensitive people in our species, of course are, our children. And it's not an accident that Canada and Australia have among the highest rates of asthma of any country in the world. And if anyone doesn't think it has to do with what we are doing to the air, come and see me, let's have a discussion. We are the air, and whatever we do to the air, we do to ourselves."

B. Other

Your night hike could lead in so many different directions (pun intended!); you just need to decide how to put your own personal stamp on it. One last website we found that has a large number of terrific video clips of beavers as well as information about them is:

www.geocities.com/bobarnebeck/BeaveReality.htm

Have fun! (see following page for a kit available through CMC and a complete list of websites cited)

Useful Websites we have found and a kit available for loan through CMC:

Websites related to the anatomy of the eye:

- www.regentsprep.org/Regents/physics/phys09/ceyes/sensing.htm
- www.webvision.med.utah.edu/anatomy.html
- www.lehp.org/diseases.htm

Websites related to astronomy and constellations:

- www.hometown.aol.com/_ht_a/gca7sky/viewing.htm (lots of links, maps, and other information)
- www.ms.essortment.com/northstarastro_rmdz.htm (info. about the North Star)
- www.comfychair.org/~cmbell/myth/myth.html (mythology of constellations)

Websites explaining the WintOGreen Lifesaver™/supernova simulation:

- www.geocities.com/Rainforest/9911
- www.science.howstuffworks.com/question505.htm

Website containing David Suzuki's entire speech (where the importance of the other elements are discussed as well):

- www.nnyn.org/videos/videos/David%20Suzukis%20Speech.pdf

Website about beavers:

- www.geocities.com/bobarnebeck/BeaveReality.htm

Kit: ***Star Stories from North America** – Curricular connections include western science (astronomy) and First Nations legends, storytelling, literacy, space, First Nations' cultural studies

*This kit includes **books** (legends, astronomy, sky charts, and reference books) **tapes** (night sounds), this **manual** on leading night hikes, ideas for **night games**, and **posters**.

*Call number is 523.8 Sta – contact Curriculum Materials Centre – Louise Hajlisz at 683-8301 or Carole-Anne Wilson-Hough at 683-8329 – to book

Night Hike

Concepts:

1. Humans are not physically adapted for life in the total dark and must use all of their senses when investigating in low-light situations.
2. Nocturnal animals have specific adaptations allowing them to succeed in the dark.
3. The dark and its creatures are unappreciated and misunderstood by many people.

What students will know:

1. The definition of the term “nocturnal”, examples of local nocturnal animals, and adaptations of nocturnal animals for life in low light conditions.
2. Interactions and interdependencies among nocturnal animals and the ecosystems of which they are a part.
3. Everything found in the darkness is there during the daylight hours.

Students will be able to:

1. Demonstrate the use of all of our senses for observations at night rather than relying solely on our sense of sight.
2. Demonstrate an awareness and appreciation for the nocturnal animals and environment.

Minnesota Profile of Learning Areas: Major emphasis: Applied Scientific Methods – Living Systems; Minor Emphasis: Inquiry

Outline

- | | |
|---|-----------------------------------|
| I. Preparation Before Activity (30 min.) | |
| II. Introduction (15 min.) | |
| A. Greeting, Grabbing, and Purpose | |
| B. Names and Introductions | VII. Clean Up (15 min.) |
| C. Activity Description | |
| D. Behaviour Guidelines | VIII. Fact Sheet |
| E. Task Analysis/Learner Assessment | |
| III. Sensory Observation (50 min.) | IX. Appendices |
| A. Feel Your Way Around | A. Equipment |
| B. Don't You See It? | B. Glossary |
| C. Natural and Un-natural Sounds | C. Activity and Safety Management |
| D. Are You “Scent”sible? | D. References/Resources |
| IV. Individual Exploration (30 min.) | E. Data Sheets |
| A. Solo Sit | |
| B. Story Telling | |
| V. Nocturnal Animals and Other Creatures (40 min.) | |
| A. Eyes that Glow in the Night | |
| B. Animals of the Night | |
| C. Adaptation Games | |
| VI. Conclusion (10 min.) | |

Night Hike

I. Preparation Before Activity

Talk to your liaison before leading the night hike. If time permits, plan the route ahead of time and hike it during the day to look for potential problem areas (low branches, extremely uneven trails, roots, stumps, etc.) and interesting features along the planned route. If you don't have time for the day hike, there is a suggested route marked on an Eagle Bluff trail map included with the Night Hike kit. Choose and plan your activities from the suggested sections to make your night hike unique. (There are more activities than you will have time to do.) Because you will be stopping often to do activities, a short loop that ends where it begins is usually sufficient. The activity "Featured Tonight" requires a daylight walk to pick features. The leader will also want to have all materials gathered for the chosen activities.

Decide whether or not students will be allowed to have flashlights. Some of the activities require use of the flashlight that is provided in the kit. Night hikes where students bring their own flashlights along generally end up being focused on the flashlights either by losing them, arguing about them, or shining them in each other's eyes rather than focusing on the night hike and the planned activities. The leader, however, should have a flashlight in case of emergency.

Because of seasonal daylight variation, some of your night hike may have to be done during daylight hours. For many of the activities, total darkness can be simulated by blindfolding students. However, the three sensory observation activities under the heading "Don't You See It?" should be done without blindfolds, and in as dark of conditions as possible. Save these activities until the end of the hike if daylight is an issue.

Here are a few tricks of the trade for leading hikes in the dark:

- Watch the sky. Wide trails have a slot opening in the treetops that can help you along the trail.
- Pay attention to the feel of the trail beneath your feet. Grass, leaves, dirt, twigs, and gravel all have their own feel.
- Appoint a "sweep" person. Pick an adult to be stationed at the back of the group. This person makes sure that no one has dropped behind or gotten lost. This also helps you know when everyone has caught up at a stopping point.
- Trail intersections are good places to stop for activities.

II. Introduction

A. Greeting, Grabbing, and Purpose. Introduce the "Night Fears Brainstorming and Poetry" activity by discussing some common fears about the night and how they might have come to be (i.e. some students may be afraid of the dark because they hear new, strange noises that they weren't aware of during the day). Have the students write down one or two words or phrases on a piece of paper describing their feelings about the night. Read the words in random order as a poem. You may have some things like: spooky, scary, quiet, dark, can't see, scurrying creatures, vampires, peaceful, etc.

As an extension at the end of the hike, write all the thoughts and words on the board and have students write a piece of poetry or a short story incorporating all the things on the board.

B. Names and Introductions. Tell the class a little bit about yourself and then go around the group to become familiar with each student. Be creative: learn names all at once or a few at a time. Use a method that suits your style. Explain that you will be teaching the class and that the other adult chaperones may be assisting at times.

C. Activity Description. Explain to the class that they will be going on a hike along the trails at night. There will be times when we stop along the way to do activities that will help us to better understand and appreciate night time, darkness, and the creatures that are active during the night.

D. Set Behavior Guidelines. Discuss clearly and specifically which behaviors you expect from your students during the class. Explain the need for respect: for you, for each other, for the equipment, and for Eagle Bluff itself. Mention the importance of keeping quiet so all students can hear directions and so that we might hear evidence of some of the nocturnal animals. You might decide on whisper voices through the duration of the hike. Reinforce the idea that in low-light situations, and especially when a student is blindfolded, actions and behaviors that may be appropriate during the day can be dangerous. Instruct students to stop and stay where they are if they become separated from the group. The best way to keep the group together is to have adult chaperones in the front and back of the group and not allow students to be in front of or fall behind the adults.

E. Task Analysis/Learner Assessment. Ask students to list some reasons why they or others are afraid of the dark.

III. Sensory Observations

It is common that when one of our senses is diminished or taken away, the other senses are heightened to compensate for the loss. During a night hike, when sight (the sense we rely most heavily on to orient ourselves) is reduced, we must use our other senses to form a frame of mind in which we feel more comfortable. The following activities help students to use all of their senses to explore the night time environment and can enhance appreciation of the natural world around them.

A. Feel Your Way Around. Without our sense of sight, we often feel disoriented and have difficulty keeping a bearing of where we are. One way to compensate for the absence of sight is by using our sense of touch. If we can feel something with our hands or beneath our feet, it can be reassuring and provide us with a sense of where we are. Also, using our sense of touch can enhance our appreciation of the natural things around us. By feeling the texture of tree bark or a mossy rock, we can experience these natural objects in a way that is more intimate and insightful than simply looking at the object.

1. **Featured Tonight (10 min.)** Find a strange geological or biological feature (tree bending around another tree, rock, rotting log). Have the students approach it, touch it, and see if they can figure out what it is or why it is as it is. This is a quick activity to get students to realize that they can not always trust their eyesight, especially at night where they must use as many of the senses as possible for investigating around them.

2. **Night Sensory Trail (15-20 min.)** Along the suggested night hike route, (southwest of Discovery Center on night hike map) a length of rope that travels along a tree, across a log on the ground, around a stump, etc. has been set up along the trail. Have students pair off and instruct one student to put on a blindfold. This student will grasp the rope and follow it along its path. The student's partner will follow closely along to prevent the blindfolded student from injury. They need to use their sense of touch to discern where they are and how to get through the course. Other rules are posted at the entrance to the trail. Please follow all safety guidelines.
3. **Blindfold Hike (20 min.)** Have the students pair off; the first student will be blindfolded (to explore and discover things in a new manner) and the other will be the guide (responsible for the safety of the blindfolded person). Lead the group over different types of terrain asking students to guess where they are going. Have them study a tree and tell all they can about it by using all their senses but sight, or ask them which direction they are traveling. Have the students switch roles.

B. Don't You See It? The human eye can see colors remarkably well during the day. Although our night vision is not as good as most nocturnal animals, our eyes are still able to adjust amazingly well to changes in light levels. These activities demonstrate some of the differences in how our vision works in light and dark conditions.

1. **Light and Color (10 min.)** Give each student a small scrap of paper and a crayon. Have them examine the crayon and determine its color. (Stick to dark, basic colors like blue, orange, red, brown etc. that have the wrappers removed.) Tell them to write their answer on the piece of paper. Nine times out of ten they will be wrong. Have the students keep their paper for the duration of the hike, but collect the crayons. You can check to see who was right and who wasn't at the end of the hike back at the building. (The guess will be written in the color of the crayon.)

Explanation: Colors are nearly impossible for humans to see at night. We have two types of cells in our eyes called rods and cones. Rods are light sensitive cells helpful with seeing at night and cones allow for seeing in color. Humans have many more cone (color) cells than rod (night vision) cells; therefore, our color vision is great (during the day) and our night vision is poor. The only other animals that can see colors nearly as well as humans are diurnal (active during the day) birds. How do we know this? Many female birds choose their mates by the bright coloration of the males. Owls on the other hand, have mostly rods in their eyes so their low-light vision is very good. (See Appendix E.2.)

2. **The Brightest Match in the Universe (5 min.)** Tell the students that they are going to see the brightest match in the universe. Have them stand in a circle and cover one eye - it doesn't matter which one. (Tell them to cover it well so that no matter what, no light will enter that eye.) Students should leave the other eye open. Explain that you are going to light a match (or candle) and you want them to stare at the flame until you blow it out (10 - 15 seconds). Light the match. After you blow it out, have the students open and close each eye, switching from side to side. Ask students to describe any differences between what they can see with the eye that was covered and with the uncovered eye.

Explanation: Looking with what had been their covered eye, things should appear clearer and brighter. This is due to a chemical called rhodopsin. Our eyes produce this chemical in low-light situations to improve our night vision. In fact, within five minutes of being in the dark, we can see 1000 times better than when we initially went into the dark. When our eyes are exposed to light, all of the rhodopsin we have been producing is instantly destroyed, making our night vision poor again. Our eyes will not be able to produce the rhodopsin again until we are out of the light.

3. **Lifesavers (5 min.)** Have the students form a circle. Pass one (please use only one per student) wintergreen lifesaver to each student. Tell them to put the lifesaver in their mouth and chew with their mouths open! (Something they aren't allowed to do at home). Look in each other's mouths and observe what is happening.

Explanation: The lifesavers will spark. Why? The following explanation is from Discover Magazine, December 1988: The sparks, which are essentially bolts of lightning in your mouth, have been studied by Linda M. Sweeting, a chemist of Towson State University in Baltimore. Plenty of other substances (most you wouldn't want to put in your mouth) also give off light when they are rubbed, crushed, or broken.

This is called triboluminescence (try-bo-loom-in-es-cents; 'tribein' means "to rub" in Greek). Some crystals of quartz and mica triboluminesce. So does adhesive tape when torn from certain surfaces. (Have you ever peeled a wrapper off of a Band-Aid in the dark? Try it!)

When sugar is fractured (in the case of chewed lifesavers), separate patches of charge, either positive or negative, form on the new surfaces or on opposite sides of cracks. The difference in charge compels electrons to leap across the gap, back and forth, and neutralize the patches. When these jumping electrons come in contact with nitrogen in the air (our air is 78% nitrogen), they cause the nitrogen to emit tiny blue-white bolts of light at the same wavelength as natural lightning.

Sweeting discovered that when candies containing both sugar and wintergreen are crushed, an additional wavelength is emitted. Wintergreen, however, is not triboluminescent. It is fluorescent, like the paint on a black-light poster. It absorbs ultra-violet light and re-emits it as light our eyes can see. When the candies are cracked, some of the light emanating from the sugar is ultra-violet, which gets absorbed by the wintergreen and re-emitted as bright, blue-green light. A more simple way to explain this phenomena is when the sugar crystals break, they release a weak burst of ultra-violet energy. This energy excites the molecules of the wintergreen oil in the lifesavers and causes the oil to glow, or fluoresce. A similar effect can be seen when two pieces of quartz are struck together.

C. Natural and Un-natural Sounds (5 min.) For many animals, keen hearing is essential to their survival. Nocturnal animals, especially, often have a highly developed sense of hearing to help them locate prey or to warn them of approaching predators. In the dark, humans tend also to depend more heavily on sound. We are able to hear many things around us at night that we are not able to see. For example, it is common to hear the hooting of an owl in the woods around Eagle Bluff, but it is a rare treat to actually see one.

On the side of the trail, along the suggested night hike route, is a parabolic listening ear which allows us to hear even quiet sounds from a far distance (the location is marked on the night hike map.) Allow students to listen through the ear for a short while, one at a time. The rest of the group should be assembled on the trail quietly listening. After identifying sounds, have the students decide whether the sounds are natural (made by animals or plants) or un-natural (made by people). Next, point out sounds the students may have missed. Listen for natural sounds like owls hooting, trees squeaking, wind in trees or grass, water gurgling, ice cracking, falling objects, etc. Some un-natural sounds are radios, cars, people talking, airplanes, etc. Another option is to define boundaries in a safe area that was selected in the daytime and have students determine where the sounds are coming from and follow them.

Explanation: Sound travels more easily through the cool, calm, moist night air. Also, we are more acutely aware of sounds as our attitudes and perceptions change due to the darkness.

D. Are You "Scent" sible? (5 min.) Many animals, especially predators, have developed an acute sense of smell to help them locate prey. Predators that are active during the night such as wolves and coyotes depend heavily on smell to locate food or prey that may be too far away to see. At night, we may be able to recognize the smells of familiar natural features to help give us

a sense of where we are. The refreshing smell of pine or the infamous scent of a skunk are just a few of the familiar scents you may encounter on your night hike.

Encourage students to smell the night air and see if they can identify any scents. Be alert for the scent of animals such as skunk or even deer musk. Have them find and describe various smells around them such as soil, a rotting log, or different plants.

Pass around the numbered scent containers in the night hike kit. When all of the students have had a chance to test the scent, have the group share their guesses. An answer card is included with the scent containers.

Explanation: The following explanation is from National Geographic, September 1986: Odors are volatile molecules. They float in the air. When you sniff, they rush through your nostrils, over spongy tissue that warms and humidifies the air, and up two narrow chambers where, just beneath the brain and behind the bridge of the nose, they land on a pair of mucus-bathed patches of skin the size of collar buttons. Here, in a process that's still a mystery, the molecules bind to receptors on tiny hair-like cilia at the ends of the olfactory nerves, or neurons, which fire the message to the brain. The signal crosses a single neural connection, or synapse: at the olfactory bulbs. (Sensations of sight, sound, and touch reach the limbic lobe less directly, across more synapses.) The amount of brain tissue in humans devoted to smell is still very great. Although we don't seem to be very aware of smells, they have a very privileged and intimate access to those parts of the brain where we really live. (Dr. Michael Shipley, a neurobiologist at the University of Cincinnati College of Medicine.) (See appendix E.4.)

Assessment: Humans are not physically adapted for life in the total dark and must use all of their senses when investigating in low light situations.

- Listen to student comments as the group first goes out into the dark. Are students afraid? Disoriented? Uncomfortable?
- During sensory activities, does the group rely on senses other than sight to explore and learn about their surroundings?

IV. Individual Exploration

Many times, the most profound and meaningful experiences that we have are due to the time spent alone. We all know the satisfaction of solving a problem or discovering something on our own. In addition, solitude in nature provides a more intimate connection with the environment around us. These activities encourage individual discovery and introspection.

1. **Solo Sit. (10-15 min.)** Spread the students along the trail, sitting them alone in a place away from other students. Place a chaperone at the beginning of the group and at the end. Have them sit quietly for 5 to 10 minutes. Gather the students in a circle and ask each to share what they saw, heard, and how they felt.
2. **Story Telling. (5-20 min.)** Story telling is one of our oldest and most sacred human traditions. Be creative. There are many Native American legends dealing with stars, the moon, owls, night, etc. Use props and involve listeners for a more complete sensory experience. People of all ages LOVE stories. Tell a story that you know or share one of the stories included in the appendix. A story can be told along the hike or at the beginning or end. If there is time during the day, select a spot along the route that could serve as a natural theatre or backdrop for the story.

Perhaps you have a favorite story of your own to share or have students make up a story by going around in a circle and allowing each student to add a few sentences as you go. Start the story with an introduction such as ... "It was a dark and stormy night...", "It was a long time ago, in a place not unlike this...", or even the famous "Once upon a time...". (If you have students that are very uncomfortable in the dark, you might want to remind students that the night hike is not a time for ghost stories and scaring people.) A few stories are provided in the Appendix. (E.5.)

V. Nocturnal Animals and Other Creatures

Spending time outside at night can make many people nervous, uncomfortable, or even afraid. This may be due to the fact that humans are not physically adapted to dark environments. Nocturnal animals, however, have developed specific physical and behavioral adaptations that allow them to be successful in the dark.

A. Eyes That Glow in the Night. Throughout the hike, periodically use a flashlight to try and catch the eyeshine of different animals. (Be aware that the use of a flashlight will affect the night vision of the whole group.) Eyeshine is the ability of the tapetum lucidum (a part of the retina) to reflect light. (See Appendix E.3.) The light is reflected off of the back of the eye and passes back through the retina to increase the eye's efficiency in low-light levels. Eyeshine is stronger in nocturnal hunters than in diurnal ones. The following is a chart of relative eyeshine strengths:

<u>Iris Color</u>	<u>Animal</u>	<u>Color of Eyeshine</u>	<u>Relative Strength</u>
yellow	Screech Owl	red	weak
yellow	Great Horned Owl	red	medium
yellow	Long Eared Owl	slightly red	strong
yellow	Snowy Owl	slightly red	medium
brown	Barred Owl	red	strong
brown	Barn Owl	red	weak
Various	White-tailed Deer	silver-white	strong
Various	Fox	red	medium
Various	Rabbit	red	medium
Various	Cat	red	strong

B. Animals of the Night. Nocturnal animals have all developed adaptations that help them to survive in low-light conditions. These adaptations may allow an animal to find prey, avoid a predator, find a mate, or succeed by avoiding competition with an animal that is active during the daytime (ex. owls and hawks).

- Owls.** Owls localize sound in an amazing but fairly simple manner. Of all land animals, owls are the best at locating a moving target in three-dimensional space. While a human is as good as an owl at identifying the source of a sound in one plane (e.g. to the right or left while standing on the ground), owls are far better at localizing sounds that come from above or below. This superior ability is based on the asymmetrical positions of the owl's outer ears. A person can tell if the sound comes from the right, left, or straight ahead because a sound from the left strikes the left ear first, and the brain interprets this as direction. Owls can do the same, but can also localize sounds above or below their heads because the left ear is much higher on the head than the right. Sounds from above will thus strike the left ear first while sounds from below will strike the right ear first. The brain compares the difference and interprets the source of the sound as above or below the owl.
- Bats.** Some bats employ the technique of echolocation to determine where things are in relation to themselves. They emit a steady stream of approximately ten clicking noises each second called

ultrasounds. Bats hear extremely faint echoes of ultrasounds as they return from distant objects. When the bat hears a pattern of echoes from an airborne insect, it increases the ultrasounds to as many as 200 per second. There are only a few milliseconds of silence between clicks, but in that blip of silence the bat's receptors detect the echoes. The signals are sent to the brain where they are processed and decoded. The brain creates a "sound map" that the bat uses to maneuver and capture the insect without even seeing it.

3. **Pythons.** The python and other "pit" snakes use thermoreceptors to help them hunt at night. The thermoreceptors are located in pit areas around the snake's mouth. The receptors are sensitive to the body heat (infrared energy) of its prey, which are much warmer than the night air. They notify the brain, which assesses the signals and determines the location of the prey. The snake can then strike with precise accuracy without even seeing the prey. The same snake, however, may slither past a motionless but edible frog. The frog's skin is cool and blends in with the background colors. The snake does not have receptors to detect it or a neural program responding to it.
4. **Frogs.** Certain species of frogs use sound frequency to communicate with local populations, even in the dark. The ears of the female cricket frog are sensitive only to a very narrow band of frequencies specific to their locality. The calls of the males also vary geographically (similar to different groups of humans having a particular dialect). A female's lack of response to a distant male's "dialect" may be due to a mismatch between her ears and his call. She may be deaf to the frequency of his calls. Thus, the males and females of the same locality are able to locate one another and communicate without disturbance or interference from frogs in a different locality even if they are the same species.

C. Adaptation Games. The adaptations of nocturnal animals are sometimes difficult to understand because they are so different than what we are used to experiencing as humans. Several of the unique strategies used by animals to survive in a dark environment can be modeled through games. These games can provide a break for students who have been quietly experiencing the nighttime world.

1. **Owl / Prey.** Discuss how owls use sound in locating prey. Have two people designated as owls. They stand facing each other on opposite sides of the trail with flashlights. The other people are mice and will try to sneak past the owls that are blindfolded. When they hear a mouse, owls flash their light on the sound. If the "mouse" is hit by the flashlight beam, they have been caught. (You may have to act as the official for any decisions.) This activity can also be done in the daylight if students point rather than use a flashlight. Discuss how different environmental conditions (rain, wind, snow, etc.) would affect the catch rate. Also, discuss the impact of noises from different ground cover (i.e. dry leaves versus hard-packed trail).
2. **Bat / Moth.** Choose a flat, open area free of obstructions for a playing area. Have three or four students designated as bats and the rest as moths. Bats and moths will have to make some sort of sound (clicking noise, hand clapping, finger snapping). Have the moths scatter over the area. The bats (blindfolded) will make the sound and then the moths return the sound to simulate the sonar effect. After each click, the moths can take one step. The bats can move freely and must close in on the moths for the capture. Touching the moth completes the capture.
3. **Firefly Tag.** Choose an open area for play. One player with a flashlight is the firefly and everyone else tries to catch them. The firefly must occasionally reveal its position by flashing the light. Whoever catches the firefly becomes the firefly in the next round.

Assessment: Nocturnal animals have special adaptations allowing them to succeed in the dark.

- Does the group search for any nocturnal animals? Are they especially quiet? Do they search for eyeshine?
- Ask the group to compare and contrast the senses and adaptations of nocturnal and diurnal predators.

VI. Conclusion

One of nature's most spectacular daily events takes place as day turns into night. When the sun sinks down below the horizon, the familiar becomes something mysterious. A large number of seemingly strange and unfamiliar animals awaken and begin their preparations for the night's activities of gathering food, hunting, mating, or calling to one another. These nocturnal animals live in a world that may seem frightening or unusual to us, but they are superbly adapted to life in the dark of night. Their bodies and habits are perfectly suited to survival at night.

Human exploration and observation of the nocturnal world can lead to insight and appreciation of nature. However, it can be a challenging task as we find ourselves in a dark and uncomfortable world that we are not used to experiencing. Our sight is diminished and we must use all of our other senses to simply walk, let alone observe the creatures of the night and their habits.

Review the activities in class. Ask the group how they feel about the night and the dark. Did some students' personal feelings change? Encourage students by telling them that it is natural to feel uneasy when you are in an environment that you are not accustomed to. However, understanding the night time and nocturnal animals can open doors to a new world full of wonder, mystery, and enjoyment that most people do not take the time or effort to understand and appreciate.

Assessment: The dark and its creatures are unappreciated and misunderstood by many people.

- Does the group's comfort level seem to increase as the hike progresses?
- After the last activity, tell the group to search for as many signs of nocturnal animals as they can find. Do the students look in different places than before? Do they listen quietly without moving?

VII. Clean Up

Make sure that all materials taken along on the hike are accounted for and haven't been left on the trail. This may involve walking the trail the next day if anything is missing. Return all the materials to the Night Hike kit. Inform the liaison of any of the supplies that are low (i.e. wintergreen lifesavers, paper scraps, matches, etc.) If you've used classroom space, be sure to stack chairs, erase the board, etc.

VIII. Fact Sheet

- Although we cannot hear bat cries, the sound waves produced are not weak. The cries have been measured at 100 decibels (about the same intensity as thunder booming overhead or a freight train rumbling past.)
- Unlike brain neurons, which last a lifetime, olfactory neurons turn over every one or two months.
- How We Hear - Sound waves vibrate the eardrum, then three small inner ear bones, and finally, fluid in the coiled cochlea. Stereocilia on the hair cells of the cochlea move in response to sound, and the hair cells convert this mechanical movement into an electrical signal that crosses a synapse and triggers a sensory neuron. This neuron, in turn, sends a message to the brain that a sound has been received.
- One might suspect that the large eyes are responsible for the owl's hunting prowess (the great gray owl in particular). In fact, the owl's night vision is no better than that of some people with particularly good night vision. A simple experiment disproves the primacy of vision in the owl: If an experimenter ties a dry leaf to a mouse's tail and places the rodent in a dimly lit room with an owl, the rodent will scurry about and the bird will pounce - not on the prey but on the rattling leaf.
- An experimental subject tends to recall the visual details of a given painting with almost 100 percent accuracy, but will forget the details within three months. The same subject will recall a series of odors with only 80 percent accuracy, but the accuracy remains at that level for a year or more. An odor, once remembered is rarely forgotten!
- Different senses and different behaviors can be localized to specific regions or groups of regions in the brain. The human brain is the most intricately organized entity in the universe, and it is this structural organization that allows the brain to work.
- Sense organs contain bare nerve cell endings modified in ways that increase their sensitivity to one physical aspect of the environment.
- Sensory Reception and the Brain - Some brain regions that play key roles in memory include sensory reception areas. Sensory input is processed by the cerebral cortex and sent to parts of the limbic system and the forebrain. The limbic system, or "emotional brain," includes regions called the thalamus, hypothalamus, amygdala, and hippocampus.
- Rods and Cones are the photoreceptors of the vertebrate eye
- Sense of Smell can be defined as the sensory pathway leading from olfactory receptors in the nasal cavity to primary receiving centers in the brain.

IX. Appendix

A. Equipment - By Activity - (any activities not listed have no required props)

- Flashlight for leader
- Blindfold Hike - blindfolds for half the group (at least 10)
- Light and Color - scraps of paper and crayons
- The Brightest Match in the Universe - matches and emergency candle
- Lifesavers - Wintergreen Lifesavers
- Are You "Scent" sible? - numbered scent containers
- Night Fears... - paper and pencils
- Read Me a Story - various stories
- Eyes That Glow in the Night (1), Owl/Prey (2), and Firefly Tag (1) - flashlights

B. Glossary

Cones: light receiving cells found in mammalian eyes that respond to bright light and contribute to sharp daytime vision and color reception.

Diurnal: relating to the daytime, referring to animals that are active during the daytime.

Echolocation: process of sending out signals and receiving their echoes to determine the location of an object.

Electrons: very light particle associated with the charge of negative electricity, a part of an atom.

Eyeshine: the ability of an animal's eyes to reflect light frequency (the number of vibrations or cycles in a unit of time).

Olfactory: of, pertinent to, or connected with the sense of smell.

Neuron: nerve cell with all of its processes, basic unit of communication in the nervous system.

Nocturnal: relating to the night time, referring to animals that are active at night.

Retina: sensitive membrane of the eye that receives the image formed by the lens and is connected with the brain by the optic nerve.

Rhodopsin: chemical created in the eye to increase the clarity of night vision.

Rods: long rod-shaped sensory bodies in the retina, sensitive to faint light and responds to coarse reception of movements (by detecting changes in light intensity across the field of vision).

Synapse: the point at which a nervous impulse passes from one neuron to another.

Tapetum lucidum: clear membranous layer found at the back of the eye that reflects light back over the retina to improve night vision (responsible for the reflection of light that we see as eyeshine)

Thermoreceptors: sensory cell that can detect radiant energy associated with temperature.

Triboluminescence: luminescence resulting from friction.

Ultrasounds: sounds emitted by bats, higher frequency than humans can hear.

C. Activity and Safety Management. Check students for proper clothing before leaving for the hike. Bring at least two bottles of water. Be certain that at least one functioning flashlight is brought along. Set clear and concise boundaries. Encourage students to remain within sight of you while exploring. Choose a route within your group's abilities. Have adults in the front and back of the group. Instruct students to stay where they are if they become lost and to call out so that people can follow the sound. Periodically count the number of students to make sure that all are present. Emphasize the need for safety precautions due to the dark. If students are blindfolded there should always be someone assigned to keep the person away from danger. Keep track of equipment you are using during the hike and make sure that it is returned to the liaison when you are finished.

D. References/Resources

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Tiser, Gene; *Night Hikes*; Lake Michigan District Naturalists

Unknown; *Night Hikes*; Lesson Ideas

Unknown; *Night Hike Activities*; Lesson Idea

E. Data Sheets

1. Sensory reception and the brain
2. Structure of rods and cones
3. Cross section of nocturnal mammalian eye
4. Sense of smell
5. Selected Stories
 - Chipmunk and the Owl Sisters
 - How Coyote Was the Moon
 - How Fisher Went to Skyland: The Origin of the Big Dipper
 - How the Bat Came to Be
 - The Great Lacrosse Game
 - Stلالuna by Janell Cannon (available in Eagle Bluff library)

1. **Sensory reception and the brain.** Different parts of the human brain process each of our five senses. Sensory input is processed by the cerebral cortex and sent into parts of the limbic system and the forebrain. The limbic system, our “emotional brain”, includes regions called the thalamus, hypothalamus, amygdala, and hippocampus.

2. **Structure of rods and cones.** The photoreceptors of the vertebrate eye.

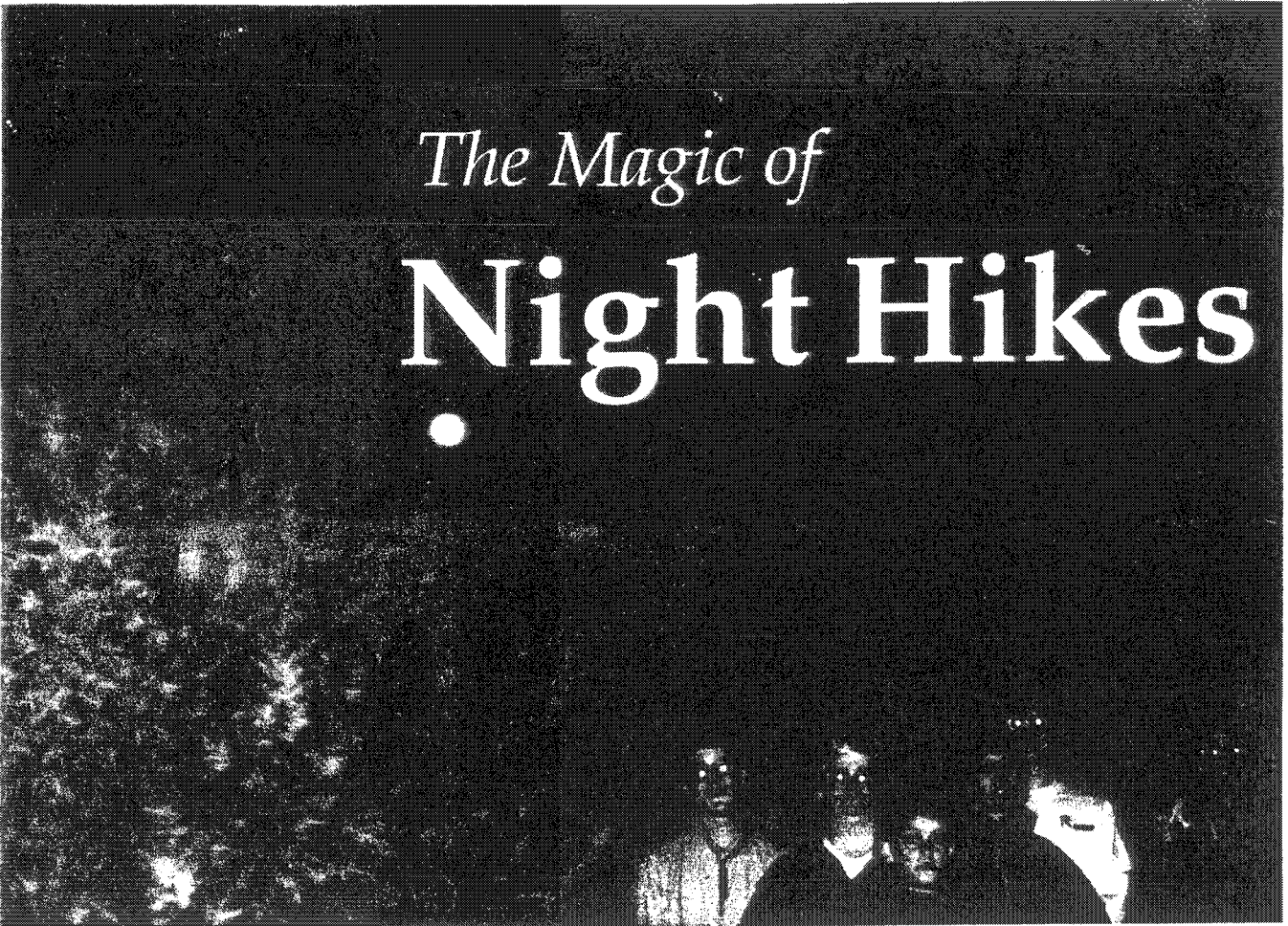
3. **Cross-section of the mammalian eye.** The retina contains the rod and cone photoreceptor cells allowing us to see light and color. The tapetum lucidum reflects light back over the retina to improve night vision. This reflected light is what causes the eyeshine seen in nocturnal animals.

4. **Sense of smell.** The sensory pathway leading from olfactory receptors in the nasal cavity to primary receiving centers in the brain.

5. **Selected Stories.** Native American and contemporary stories related to the night time, stars and constellations, and nocturnal animals.

The Magic of Night Hikes

Tim Allieri



With a good plan and thorough preparation, a walk in the nighttime world is a safe and wondrous experience for all.

by Tim Allieri

TO MANY PEOPLE, including many school administrators, a venture into moonlit woods with a group of students would seem sheer lunacy. But a "moon-walk" can be a stroll into romance, a thrilling journey into the unknown, and a fascinating way for students to gain a new perspective on nature. Depending on the season, your students may observe spring beauties wrapping their blushing petals around dainty anthers and pistils for the night, or evening primroses and other night bloomers opening up to the dark. They may glimpse moon shadows outlined by sparkles in frosted grass, or marvel at the hovering firefly and its earth-bound larva, the glow worm. On clear nights, constellations will ripple in slow-moving brooks, and while most folks in your community prepare for sleep, scores of other fascinating organisms will perform a real-life drama for your students. An occasional ground beetle may amble along the moist forest floor in search of food or a mate. A bright flashlight beam shining from the bank of a shallow pond will expose aquatic life with startling clarity. A mock distress call may bring a fox charging across a field to investigate. Owls may return your hoots from their distant territories. With binoculars trained on the full moon, students may spot the silhouettes of "bird clouds": flocks of vireos,

thrushes, warblers, shorebirds and other high-flying migrants who avoid predators by travelling under the veil of darkness. Skunks may be sighted digging through leaf litter and raccoons heard splashing water along stream banks in their nightly hunt for food.

There are indeed dangers in taking an inexperienced group of kids into a dark forest for a walk. However, by communicating to resistant administrators, students and parents that you have taken steps to ensure safety, the path can be cleared for learning and enjoyment. Nothing beats a good plan. By following your school's field trip policy, you will be presenting your hike to the principal in a familiar format which addresses liability issues and provides basic details about the event. If you have never led a group on a night hike, enlist the help of an experienced naturalist. Not only will this diminish the administration's concerns, but you will also learn techniques concerning safety, logistics, group management and content delivery.

Decide which trail to use well in advance of the event. Choose a less difficult alternate trail to use in case your group unexpectedly includes less-able hikers (most parks have superb wheelchair-accessible trails that will provide plenty of teachable moments). Avoid paths that pose nighttime hazards such as those that closely parallel steep stream banks and rocky cavities. After choosing the paths, secure

permission to use them. Most conservancies, parks and forestry bureaus maintain trails as part of their resource management plan. Request to have the trail cleared of branches that may pose eye hazards at night, or ask permission to remove these branches yourself. Learn the trails in the daytime so that you will be familiar with them at night. The afternoon before the hike, walk the trails and clear them of fallen debris.

In scheduling your night walk, keep in mind that the closer the date is to the night of the full moon, the more natural light will be available, even under overcast skies. In addition, both students and parents may prefer Friday or Saturday night hikes over school night events. One hour is recommended for a session with elementary students, while explorations with older students can easily fill up to two hours. The amount and type of interpretation and trailside activities will determine the distance of the hike.

Both for safety and educational reasons, it is advisable to limit your group to fewer than 20 people, including students and parents or other adult chaperones. Groups of five to ten people are ideal because small groups tend to encounter more wildlife than larger ones. To counter the wildlife spook factor, consider offering two nights of hikes, one for each half of your class. This solution may also better accommodate families with busy schedules. Or coordinate two groups on the same night with the aid of an experienced naturalist.

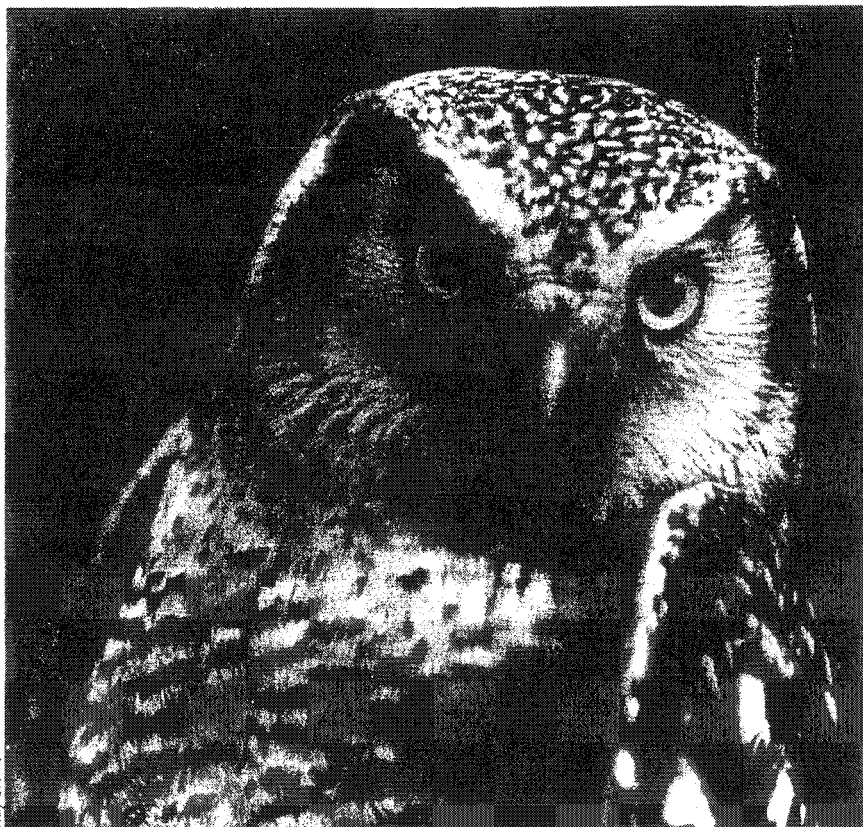
Do not take for granted that students will know how to prepare for the walk. They should wear sturdy, comfortable walking shoes and clothes that are appropriate for the weather conditions. Each student should also bring a water bottle and flashlight. Inform students and chaperones ahead of time of the length of the walk, both in distance and time. If there will be no restroom facilities available, let hikers know this, too. No pets should accompany the group. Discourage the use of walking sticks in darkness, which can cause people to become unintentional dealers and receivers of blows. Enlist adult drivers and chaperones and determine in advance if participating parents have special needs. Request the cooperation, courage and curiosity of everyone invited to the hike.

Communicate your intentions to the park rangers or local police. They will appreciate this courtesy when they come across your group's unoccupied bus or cars parked near the trail entrance at an unusual time. They will also be informed should someone request that they check out suspicious activity in the area. If there are unoccupied cars parked at the trail head when your group arrives and you know the trail would normally be closed after sunset, it may be wise to notify the rangers or

police. It would be uncouth to lead your hiking party to a teenage beer party, or worse.

To make the best of the learning situation, pay particular attention to the needs of those who most fear the woods at night. Speak reassuringly about enjoying nocturnal nature. Ask everyone to sign in upon arrival. Although you and your students may be familiar with each other, participating parents may not be. In a circle, ask the participants to introduce themselves by their first names and birthplaces. Identify those who came to the event together and ask them to keep an eye on each other. Link up loners with others to help ensure their safe return from the hike.

Advise participants to be sure that their watches and jewelry are well fastened and that their keys are buried deep in their pockets to avoid losing them on the dark trail. En-



Ray Crome

On clear nights, constellations will ripple in slow-moving brooks, and while most folks in your community prepare for sleep, scores of other fascinating organisms will perform a real-life drama for your students.

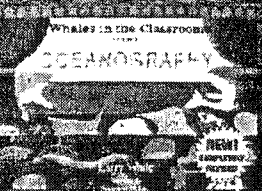
courage hikers who have flashlights to use them only when they feel that their safety is in jeopardy. Explain the concept of night vision: In darkness, the pupil dilates to permit more light into the inner eye. Remind the walkers to "recharge" their night vision periodically during the hike to improve their natural eyesight. This can be done by closing the eyes for 15 seconds or more.

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Discuss activities designed to heighten the other senses as well. Extending the outer ears with cupped bare hands will collect sound from a specific direction, while decreasing interference from unwanted sounds. Detecting the direction of air currents and the scents they carry will help students locate musky animals, aromatic plants, odorous wetlands, and earthy forest litter. A general mindfulness of the nighttime environment will help your participants leave behind their worries, increasing their awareness of the present moment and the flurry of natural activities surrounding them.

Inform the group of the your planned route and distribute maps which have the route marked so that it is visible with a flashlight. If blazes or signs are used on the trails, teach the group about the trail marking system. Demonstrate how to step higher than usual to avoid tripping on rocks, roots or debris hidden in the darkness. Instruct the hikers to walk in single file or in pairs at the most. Emphasize your wish for everyone to stay on the trail to avoid injuries to walkers and wildflowers alike. By wandering off the trail, participants may step into hornet nests, fall into holes, get whipped in the face with branches, and even get lost.

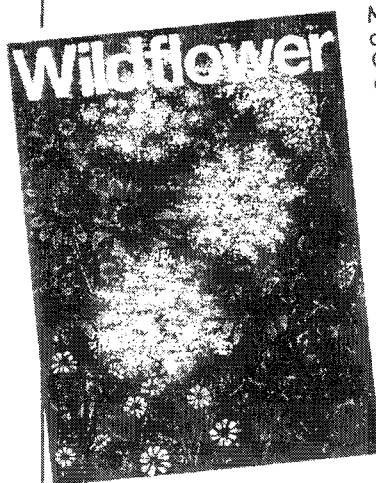
Bring along a cell phone and tell the hikers you have this equipment. This reassures concerned participants that you can get help if a problem arises. It is also good information in the event that you become the focus of a medical emergency yourself.

Count the participants out loud and check that number against the number of people on your sign-in sheet. Choose a caboose: a willing and responsible adult to bring up the rear in order to help keep an eye on the hiking party and to mark the group's end. Stop the walk at least every 50 meters for interpretation and a group check. At alternate stops, ask the caboose questions about the walking speed, voice levels and how things are going in general. Most participants find this reassuring because it demonstrates your concern for the safety and enjoyment of the group. Along the trail, warn of outcrops, roots and other walking hazards by pointing to the objects and saying "pass it on." Request that frequent talkers reduce their gabbing to increase possibilities of encounters with creatures, but also to keep the air clear for wildlife sounds, interpretation and safety messages.

At the end of the nighttime walk, remember to count the hikers when you return to the starting point. After you've wrapped up your event, get into your vehicle just as the last group members climb into theirs. If you're in a secluded area, it may be a good idea to lock your car doors. Wait there until the last vehicle from your group departs the site. Use your cell phone to communicate to a colleague or family member that your event is over and that you are safely out of the woods and on your way home.

Addressing the fears of those leery of nocturnal nature will go a long way to soften their self-imposed limits to learning and having some fun.

Tim Altieri is a county park naturalist and high school science teacher who leads monthly moonwalks in Lancaster, Pennsylvania.



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Leadership and Group Work

NIGHT GAMES



- There's something about "darkness" that brings out the "kid" in everyone!!

Presented By: Dan Arndt

Opportunity 2001 November 5th Mount Royal

2. Gotcha

Equipment – flashlights for members of one team

- team of adults - team of students

Game Procedures

- The goal of this game is for one member of the “hiding” team to get to home base without being touched first.
- A good location to play this game is where home base is in a clearing and there are trees and buildings and other things to hide behind.
- The “Gotcha Team” will stand by “home base” and count to 50 while the “Adult Team” runs away in the surrounding area to hide. Some adults have been known to climb the trees to hide.
- All members of the “Gotcha Team” should have a flashlight.
- Once the count reaches 50 the hunt is on.
- To catch members of the opposition “Gotcha” members must hit a player with the beam of their light, touch them and call their name before they get to home base.

Rules

- Pre-determined boundaries are explained
- Pre-determined time limit is explained
- When people are caught, they must return to home base area until time limit expires.
- “Gotcha” members are encouraged to hunt out opposition but some members should stay close to home base.
- If 1 member of the hiding team gets to home base without being touched and identified, their team scores a win for that particular round.

Variations

- When people are caught they could be sent to a pre-determined starting object and return to the game.
- This game could be played with 1 “Gotcha Person” while the other members of the group hide. In this variation, the first person to make it to the home base without getting caught is the next “Gotcha”.

3. Prison Escape

Equipment – Flashlights for the Prison guards

- Pylon cones or something to mark out a large circle

Rules

- A 10 meter diameter prison is marked out in the middle of a field with pylon cones.
- The no-man's land around the prison should stretch out in all directions for about 100 meters.
- As much as possible, the no-man's land should be filled with brush and trees to give everyone something to hide behind.
- $\frac{3}{4}$ of the group are placed in the prison as prisoners.
- The other $\frac{1}{4}$ of the group are the prison guards and each of them have a flashlight.
- It is the prisoner's job to try and escape the prison, cross the no-man's land surrounding it and make it to the outside world.
- The prison guards try and keep the prisoners in the prison.
- If a prisoner is hit by a light beam, he/she must freeze. If his/her name is clearly stated by a prison guard, that prisoner must return to the center of the prison before trying to escape again.
- **Guards can only turn their flashlight on for a 5 – 10 second period before it must be turned off.** They must wait 5 – 10 seconds before turning it back on.
- If a prisoner makes it out of the entire area, they are considered to be free.
- The prison guards shouldn't be allowed to get within 15 – 20 meters of the prison. This area could have a boundary of pylons.
- After a certain amount of time, the round is over and count up the number of escaped prisoners.
- Let another team of guards try their luck.

Variations

- If the guards have it too easy, reduce their numbers.
- If the prisoners have it too easy, increase the guard numbers.

4. Mission Impossible (Variation #1)

Equipment – flashlights for teachers/parents

- treats for students
- picnic tables

Rules

- This game should be played with brush and trees around to hide behind.
- There should also be an open area where 2 teachers/adults are sitting on a picnic table with flashlights.
- There should be a box of treats (suckers, candies, etc.) placed on another picnic table within 10 meters of the adults.
- Clearly identify the playing area boundaries.
- Adults would give the students an opportunity to hide in the playing area without watching them. A could to 20 would probably be sufficient.
- Students attempt to sneak quietly and carefully to the treat box without getting caught. If they are successful in obtaining a treat they would start again (depending if you wanted them to get another treat).
- The adults must shine the beam of light on the student (who freezes) and identify him/her to catch the individual. If caught, the student must return to the boundary area to start again.
- Teachers/adults cannot leave light on for long periods of time (unless they are running out of treats of course!).

4. Mission Impossible (Variation #2)

Equipment – Flashlight for every player

- Cardboard or stiff paper
- Some type of container for a base

Rules

- Everyone needs a flashlight in this variation. A person can play without one but they can't do anything against another player without a flashlight.
- Divide the group into 2 teams.
- Clearly identify the playing area boundaries.
- Each team must set up their own home base inside the boundaries.
- Time must be given to the instructor to hide the Secret Papers.
- There will be 10 **Secret Papers** hidden throughout the playing area. They could be on the ground, stapled to a tree, taped to a picnic table, etc. the more spread out throughout the playing area, the better.
- All players must start at their own home base.
- The **mission** for each team is to recover and return to base a total of **5 secret papers**. The first team to 5 in their Base is the winner.

- If a person finds one of the **secret papers**, they must carry it in their hands so that it is visible and they must return to home base immediately. **No one can carry more than 1 paper.**
- While they are out and looking for the papers, if they are hit by the “beam of light” from a flashlight at any time, they are required to return to their home base from where they can start again.
- If they are carrying one of the **secret papers** at the time, they must drop it where they stand and return to base without it.
- Any paper inside a base stays there permanently. **No one can steal from a base.**

Variations

- Allow people to infiltrate and steal the papers from the other team’s base.
- Have a jail that people have to go to if they get caught in a beam of light.
- Only allow a certain number of flashlights (e.g. only 5 flashlights per team)

5. Turkey Hunt

Equipment - no equipment required

Rules

- Clearly identify the playing area boundaries.
- **3 “Turkeys” are picked (Adults first) to hide from the rest of the group.**
- The playing area should be some distance from the starting point.
- This game is best played in an area with lots of trees and brushes.
- The “Turkeys” would hide in a spot (e.g. in the trees) and stay there throughout the complete game.
- The group would allow sufficient time for the “Turkeys” to hide (5 minutes or so).
- The **mission** for each member of the group is to find the turkeys and hide with them from the rest of the group. The game is played to see who is the last one to find the turkeys.
- The “turkeys” must stay quiet unless they hear the words, “**gobble, gobble**”. They would in return respond with a quiet, “gobble, gobble”. The hunters would attempt to pinpoint their location by the continual chant of “gobble, gobble”. Turkeys would respond, “gobble, gobble”.
- When hunters finally locate the turkeys through their chant, they would join them quietly in their hiding spot.
- It’s important that “**turkeys**” stay quiet in their hiding spot. If hunters walk by without chanting “gobble, gobble”, the turkeys would remain quiet.
- You could have a pre-determined time for everyone to find the “turkeys”.

Eyes At Night Hike

Hike Preparation at Home

Materials:

Black construction paper

Reflective Tape

Poster board

Glue Stick

Markers

You will need to make **two** sets of eyes, one for the trail, and one for the poster.

1. Cut black construction paper into 16 2"x 4" strips
2. Using the picture below as your guide (print out and cut apart to make templates), cut eyes out reflective tape and attach to construction paper strips.
3. Attach one set of eyes to the poster board, and label each pair of eyes (see picture) for the group to use as a key when hiking



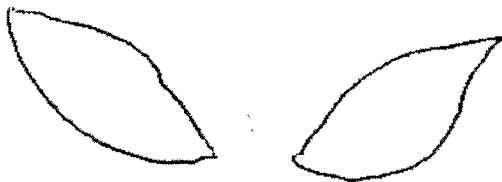
Owl- High in tree



Fox- 2' from ground



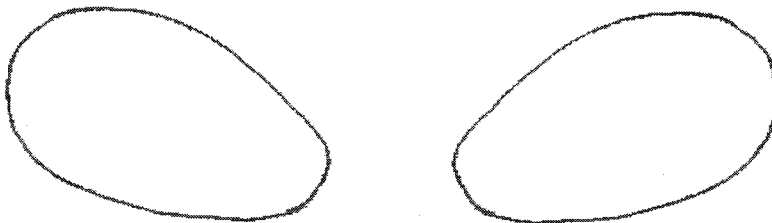
House cat- 6" to 1' from



Skunk- 8" from ground



Rabbit- 6" above ground



Deer- 4-5' from ground



Raccoon- 1 1/2 -2' from



Possum- 1 1/2 -2' from

Hike Preparation at Camp

Materials:

Night Eyes Poster

Set of Night Eyes

Masking tape, string or thumbtacks

Do this during the day! The other adults with your troop should keep the girls busy (preferably on the other side of camp).

1. Pick an area or trail that gives room for several people to stand together, as well as an area that has room for a group to gather prior to entering the trail.
2. Using the poster as your guide, hang the eyes at suggested heights on trees or bushes so that they are visible from the trail. Avoid brushy areas that would obscure the view of the eyes.
3. Map the trail for future reference and retrieval (optional)

Leading the Hike

This hike is best done when it is very dark. Only the group leader should have her flashlight on at this time. Lead the group to the Night Eyes Trail, keeping your flashlight pointed to the ground. Have another adult bring up the end of the line. As you walk, you may encourage the participants to discuss the sounds you may hear at night and to listen carefully for them.

When you reach the gathering spot, hold up the poster and let everyone shine their light on it. Explain that you are going to be hunting for special animals on the trail. Only their eyes will be visible. Ask how many have seen night eyes when driving. How could they tell what animal it was just by looking at the eyes? Demonstrate by placing flashlight up beside your eyes (girls can do this, too). Explain that they will be looking for animals off to the sides of the trail and on either side of it. They will need to look in the trees and undergrowth. If they spot a pair of eyes, they should try to guess what animal they have found. You may tell them how many eyes are out on the trail. The poster is available to help them identify the animals.

If holding a contest for the most animals spotted, you may split up the group into teams at this point. An adult should accompany each team. Give the first team a few minutes head start. Instruct the girls to stay on the trail and walk with a buddy. Flashlights can be turned on now, but they should be pointed at the ground until they reach the beginning of the trail. After each group finishes, they should return to the campsite.

Retrieve the eyes in the morning. Save the eyes and reuse, if possible.

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Eyes At Night Hike

Variation: Ghost and Goblin Hike (Halloween)- make pairs of round or oval eyes. Use construction paper scraps to make irises for the eyes, if you wish. If you make a poster key, you may label the eyes "ghost", "goblin", "trick-or-treater", "black cat", etc.

Idea developed by Wally Brines, Naturalist at Woodlands Nature Center, DuPage, IL and Girl Scouts of DuPage Council. New format and variation by A. Robert-Curry, Whispering Oaks Girl Scout Council, LaGrange Park, IL

SFC Activities Scouting File Cabinet