You MUST attend at least one Bryce Canyon Ranger Program.

Next Program:

Write something you learned from the program (details please!)

Using enclosed glove, pick up and dispose of at least 10 pieces of litter.

“I want to complete all activities for ages 18+.”

Adult Signature:

Note: The activities on pages 2-3 and 8-9 count as TWO activities each!
"I think that climate change is the greatest threat to the integrity of the National Park System that we have ever faced."

~ Jon Jarvis, National Park Service Director

Carbon dioxide (CO₂) traps heat. The best way to stop Global Climate Change is to reduce CO₂ emissions. Did you know that by using less energy, getting more exercise, and eating healthy food you can help protect national parks and the whole world? After you make all the calculations below, look for ways to lower your carbon footprint and then stick to that plan! Then invite your friends and family to do same.

What's Your Carbon Footprint?

Your “carbon footprint” is the total amount of CO₂ you create from the way you live. A big carbon footprint is bad for the planet.

In the charts below and on the facing page, find the lifestyle and food choices that are closest to the real ones you make during an average week. Add annual home heat/cooling and then subtract Energy Conservation. You make during an average week. Add annual home lifestyle and food choices that are closest to the real ones you make during an average week. Add annual home

Average Person’s Carbon Footprints
From Around the World (tons/year)

<table>
<thead>
<tr>
<th>Country</th>
<th>Average Person’s Carbon Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>15.7</td>
</tr>
<tr>
<td>Germany</td>
<td>9.6</td>
</tr>
<tr>
<td>UK</td>
<td>8.5</td>
</tr>
<tr>
<td>Italy</td>
<td>7.1</td>
</tr>
<tr>
<td>France</td>
<td>6.2</td>
</tr>
<tr>
<td>Switzerland</td>
<td>4.0</td>
</tr>
<tr>
<td>Mexico</td>
<td>3.9</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.2</td>
</tr>
<tr>
<td>Canada</td>
<td>1.6</td>
</tr>
<tr>
<td>USA</td>
<td>1.4</td>
</tr>
<tr>
<td>China</td>
<td>1.3</td>
</tr>
<tr>
<td>S. Korea</td>
<td>1.2</td>
</tr>
<tr>
<td>Japan</td>
<td>0.9</td>
</tr>
<tr>
<td>Israel</td>
<td>0.5</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>0.3</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.3</td>
</tr>
<tr>
<td>Kenya</td>
<td>0.2</td>
</tr>
</tbody>
</table>

~ HYGIENE ~

<table>
<thead>
<tr>
<th>Activity</th>
<th>CO₂ (lbs)</th>
<th>CO₂ Times per wk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taking a shower</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Taking a bath</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>6 minutes of hair drying</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Washing 1 load of laundry</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Drying 1 load of laundry</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Using dishwasher (1 load)</td>
<td>2.9</td>
<td></td>
</tr>
</tbody>
</table>

Total Carbon Footprint from Hygiene: _1_

~ TRANSPORTATION ~

<table>
<thead>
<tr>
<th>Activity</th>
<th>CO₂ (lbs)</th>
<th>CO₂ per wk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking, bicycling, skateboarding</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Electric Car (50% Coal electricity)</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Bus (School or Metro), Train/Subway</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Hybrid Car (40mpg)</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Car (40mpg)</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Car (20mpg)</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Jet Plane (1000-mile segment)</td>
<td>13.5</td>
<td></td>
</tr>
<tr>
<td>Bullet Train (1000-mile segment)</td>
<td>2.1</td>
<td></td>
</tr>
</tbody>
</table>

Total Carbon Footprint from Transportation: _2_

~ FUN ACTIVITY ~

<table>
<thead>
<tr>
<th>Activity</th>
<th>CO₂ (lbs)</th>
<th>CO₂ per hour</th>
<th>CO₂ per wk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watching TV</td>
<td>1.4</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Video game (includes TV)</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Desktop Computer</td>
<td>1.4</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Laptop Computer</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Reading, board/card games</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Hiking, bicycling, canoeing, snowshoeing</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>ATV, Boating, Snowmobiling</td>
<td>6.2</td>
<td>6.2</td>
<td></td>
</tr>
</tbody>
</table>

Total Carbon Footprint from Fun: _3_

Hint: A calculator makes this MUCH easier!

Fun can have a big carbon footprint when electricity and/or fossil fuels are used! Using mass transit is even better than a hybrid car!

Benchmark locations are designated on the maps below by the **Benchmark** icon. More detailed trail information and further instructions about the "Hike the Hoodoos" activity can be found in the park newspaper, *The Hoodoo*.

"Hike the Hoodoos!"

Are you ready for adventure? Take the "I Hiked the Hoodoos" challenge!

This activity is for visitors of ALL ages, and allows you to explore Bryce Canyon’s trails, have fun, and get healthy at the same time.

To meet the challenge, you must do BOTH of these things:

1. Hike a minimum of 3 miles/4.8 km on trails that have special "I Hiked the Hoodoos!" benchmarks as shown at right (see chart below).
2. Use the back page of this booklet to make pencil rubbings of the benchmarks. Bring the rubbings (or if you prefer, photos of yourself with the benchmarks) to the visitor center to receive a small reward. Also, this activity counts as a Junior Ranger Booklet requirement if you answer the question (#4) in the box on the back page.

Benchmark Location Chart

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Distance*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>miles</td>
</tr>
<tr>
<td>1. Mossy Cave</td>
<td>0.8</td>
</tr>
<tr>
<td>2. Rim Trail</td>
<td>2.5</td>
</tr>
<tr>
<td>3. Tower Bridge</td>
<td>3.0</td>
</tr>
<tr>
<td>4. Queens Garden</td>
<td>1.8</td>
</tr>
<tr>
<td>5. Navajo Loop</td>
<td>1.3</td>
</tr>
<tr>
<td>6. Peekaboo Loop (from Sunset Point)</td>
<td>2.4</td>
</tr>
<tr>
<td>7. Wall of Windows (from Bryce Point)</td>
<td>3.2</td>
</tr>
<tr>
<td>8. Sheep Creek</td>
<td>4.0</td>
</tr>
<tr>
<td>9. Bristlecone Loop</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*round trip

Trail difficulty: Easy, Moderate, Strenuous

Hint: A calculator makes this MUCH easier!

Fun can have a big carbon footprint when electricity and/or fossil fuels are used! Using mass transit is even better than a hybrid car!

Benchmark locations are designated on the maps below by the **Benchmark** icon. More detailed trail information and further instructions about the "Hike the Hoodoos" activity can be found in the park newspaper, *The Hoodoo*.

"Hike the Hoodoos!"

Are you ready for adventure? Take the "I Hiked the Hoodoos" challenge!

This activity is for visitors of ALL ages, and allows you to explore Bryce Canyon’s trails, have fun, and get healthy at the same time.

To meet the challenge, you must do BOTH of these things:

1. Hike a minimum of 3 miles/4.8 km on trails that have special "I Hiked the Hoodoos!" benchmarks as shown at right (see chart below).
2. Use the back page of this booklet to make pencil rubbings of the benchmarks. Bring the rubbings (or if you prefer, photos of yourself with the benchmarks) to the visitor center to receive a small reward. Also, this activity counts as a Junior Ranger Booklet requirement if you answer the question (#4) in the box on the back page.

Benchmark Location Chart

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Distance*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>miles</td>
</tr>
<tr>
<td>1. Mossy Cave</td>
<td>0.8</td>
</tr>
<tr>
<td>2. Rim Trail</td>
<td>2.5</td>
</tr>
<tr>
<td>3. Tower Bridge</td>
<td>3.0</td>
</tr>
<tr>
<td>4. Queens Garden</td>
<td>1.8</td>
</tr>
<tr>
<td>5. Navajo Loop</td>
<td>1.3</td>
</tr>
<tr>
<td>6. Peekaboo Loop (from Sunset Point)</td>
<td>2.4</td>
</tr>
<tr>
<td>7. Wall of Windows (from Bryce Point)</td>
<td>3.2</td>
</tr>
<tr>
<td>8. Sheep Creek</td>
<td>4.0</td>
</tr>
<tr>
<td>9. Bristlecone Loop</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*round trip

Trail difficulty: Easy, Moderate, Strenuous
Bryce Canyon Bingo

As you explore Bryce Canyon, look for the things shown below. When you see one of the items, draw a circle around it. Try to get 5 in a row (horizontally, vertically, or diagonally) to finish this activity. Can you find them all?

- Moon
- Columbine
- Steller’s Jay
- Evening Primrose
- Golden-mantled Ground Squirrel
- Ranger Hat
- Pine cone
- Mule Deer
- Violet-Green Swallow
- Lightning
- Pronghorn
- Short-horned Lizard
- Butterfly
- Aspens
- Bryce Canyon Lodge
- The Milky Way
- Prairie Dog
- Hoodoos
- Manzanita
- Raven
- Shuttle
- Table Cliff Plateau
- Bench Mark
- Free Space

Note: The activity on these two pages counts as TWO activities!

Next, add the four CO2 lifestyle totals from 
1 2 3, and 4. Write the sum here:

This is your Carbon Footprint for ONE WEEK. Multiply the weekly number by 52 for your YEARLY total.

My lifestyle yearly CO2 total is: __________

FINALLY, my ADJUSTED yearly CO2 total is: __________ lbs CO2
(divided by 2000) = __________ tons CO2

BONUS: What Else Can You Do?
The best thing to do is use LESS fossil fuel energy. Planting trees helps, but not as much as you think. 1 tree only makes up for (offsets) 9 cheeseburgers!

Energy saving bulbs also last MUCH longer!

Remember you eat about 20 meals per week!

\[ \text{Total Footprint from Food} \approx \sum \text{Food Item CO2 lb} \times \text{times/week} \times 52 \]

\[ \text{Home Footprint (per bedroom)} \approx \text{Heat/cool per month} \times 12 \times \text{num of bedrooms} \]

\[ \text{Energy Savings Contributions} \approx \sum \text{Energy Saving Action} \times \text{Reduction} \]

My portion of my home’s yearly CO2: __________

SAVE 1 tree per __________ lbs CO2

\[ \text{BIOLOGICAL CONTRIBUTIONS} \approx \text{num of people} \times \text{Offset items} \]

\[ \text{Total Carbon Footprint Reduction} = \text{Energy Savings Contributions} + \text{BIOLOGICAL CONTRIBUTIONS} \]

\[ \text{Total Carbon Footprint: } \text{ADJUSTED total} + \text{ADJUSTED yearly CO2} \]

\[ \text{FINALLY, my ADJUSTED yearly CO2 total is: } \text{original ADJUSTED total} \]

\[ \text{FINALLY, my ADJUSTED yearly CO2 total is: } \text{original ADJUSTED total} \]

\[ \text{FINALLY, my ADJUSTED yearly CO2 total is: } \text{original ADJUSTED total} \]
Much Ado About Hoodoos!

The drawing below shows geologic layers of rock. Geologists call this a stratigraphic column. On the left side of the column are the rocks’ names and descriptions.

On the right side of the column are the rocks’ symbols. You can tell how hard or soft a rock is by how far it sticks out in the column. Harder rocks bulge out; softer rocks indent.

1. **Label the Layers**
   - Use the rock symbols to label all of the rock layers.

2. **Create a Hoodoo**
   - Draw and label a hoodoo in the space at left. Use at least two different rock types from the stratigraphic column and rock symbols as shown above.
   - Draw and label a hoodoo in the space at left. Use at least four different rock types from the stratigraphic column and rock symbols as shown above. Show different thicknesses and hardnesses of rock in your hoodoo.

This activity has two parts. Completing both parts counts as one activity.

### Hoodoo: noun.

A pinnacle or odd-shaped rock left standing from the forces of weathering and erosion.

Draw and label a hoodoo in the space at left. Use at least two different rock types from the stratigraphic column and rock symbols as shown above.

Draw and label a hoodoo in the space at left. Use at least four different rock types from the stratigraphic column and rock symbols as shown above. Show different thicknesses and hardnesses of rock in your hoodoo.

### Southern Paiutes

The Southern Paiute Indians lived in the Bryce Canyon area for centuries during Spring, Summer, and Fall. They were experts in using many different resources in order to eat, build shelters, make clothing, pieces of art, and tools for gathering food and collecting water. Read about the Southern Paiute Indians in the text box, then answer the question (in red) below.

**Food**: Southern Paiutes ate many things, including: jackrabbit (*ku’moo*), pronghorn (*wunts*), sego lily (*kogge*), pinenuts (*too’vuts*), and crickets (*awdung’kupeets*).

**Home**: They used small domed shelters known as *kahns* when they needed temporary shelter. Kahns were made of branches, bark, and grasses.

**Method of Travel**: On foot (*nampa*).

**Clothing**: They wore clothing made of animal hides and sometimes plants. Men wore clothing known as *madooha koosa* and women wore clothing called *kumoo’muhdoo’e*.

**Art**: Southern Paiutes are known for their beautiful baskets (*yuh’up*) which were woven from twigs and reeds. Baskets were used to gather nuts and berries and to carry water.

**Everything the Southern Paiutes used came from nature. Even today, every man-made item we possess is made from natural materials. Can you name 5 man-made items you own and the natural materials they came from?**

1) ___________
2) ___________
3) ___________
4) ___________
5) ___________
Match the Tracks!

Some of the animals in Bryce Canyon are rarely seen, but we know they are here because they leave footprints or other signs behind. Use your knowledge of these animals to try to match them to their tracks!

- ............... Match at least five animals to their tracks.
- ............... Match all animals to their tracks.

Prairie Dog

Mountain Lion

Golden-mantled Ground Squirrel

Mule Deer

Weasel

American Black Bear

Geology I.Q.

Attend a Geology Talk, watch the park movie, or look in the visitor center for clues! Answer the questions below and complete all the parts to finish this activity.

1) What mineral gives our rocks their red color? ____________

2) Why is Bryce Canyon not really a canyon? _______________

Life of a Hoodoo

The sketches below show the life cycle of hoodoos. Place a number in the box to show which event happens first, second, third, and fourth in the life of a hoodoo.

- window/ark
- wall/flin
- rounded hills
- hoodoos

Did you know?

After Bryce Canyon’s rocks were formed, weathering and erosion began sculpting the rocks into strange-looking pinnacles called hoodoos. From the words below, circle all the sources of erosion that are NOW carving Bryce Canyon’s hoodoos.

- rain
- snow
- tornadoes
- bulldozers
- people
- ice
- waves
- tree roots
- fish
- aliens
- people
- wind

Inspiring Words

The wonders of Bryce Canyon inspire many artists, photographers, writers, and poets. Haiku is an easy form of Japanese poetry that contains only 3 lines. The first and third lines have 5 syllables (or beats) and the second has 7. Think of something that you found inspiring about Bryce Canyon and write your own Haiku! Below are some examples to help you get started:

- Beautiful red spires
  Reaching for the deep blue sky
  How long can they last?

- In the dark of night
  I marvel at brilliant stars
  In the Milky Way!
Using the information provided, test your knowledge of Bryce Canyon's wildlife by completing this puzzle. For clues, attend a ranger program, look in the visitor center museum or the Hoodoo newspaper!

**Across**

1. The Violet-green S____ catches and “swallows” insects as it flies among the rock pinnacles.
2. The B____ is a mammal with yellow-gray fur and a white stripe (like a “badge”) across the top of its head. It uses its long claws to dig out rodents to eat.
3. The L____ is a large black bird, cousin to the crow, with a call that sounds like a “croak.”
4. The Yellow-bellied M____ is sometimes called a “rock chuck.” It looks like a beaver, except for its bushy tail.
5. The S____ is a small, black and white nocturnal (active at night) animal that defends itself with a powerful, smelly scent it sprays from glands beneath its tail.
6. A four-legged, fast-moving reptile, the B____
7. The W____ is a long, slender mammal with short legs. Its fur is tan in summer and white in winter, with a black tip on its tail.
8. A small gray bird, belonging to the Sparrow Family, often seen hopping on the ground picking up seeds. Dark-eyed J____
9. The C____ looks a lot like its cousin, the Golden-mantled Ground Squirrel, but it’s smaller and has stripes on its face.
10. A small, plump bird with a black cap, white breast and gray back. It is often seen climbing down tree trunks headfirst! White-breasted N____
11. This chubby, striped rodent is always begging for food, even though human food is unhealthy and there are plenty of natural things to eat. Golden-mantled Ground S____
12. M____ Deer can be seen at dusk and dawn, browsing in meadows and along roadsides. They get their name from their large ears.
13. The E____ is a member of the deer family and is the largest mammal at Bryce Canyon. Bulls are known for their loud “bugle.”
14. The F____ is a nocturnal predator from the raccoon family. Its name comes from its long, bushy tail which has black and white bands (or “rings”).
15. The P____ is a slow-moving mammal who eats tree bark and burrows in small meadow “towns.” It often sits atop its mound to warn others of danger.
16. The H____ is a tiny bird that eats nectar from red flowers. Its name comes from the sound made by its rapidly-beating wings.
17. This hoofed animal flew Perseus to rescue princess Andromeda from the sea monster. The constellation Andromeda is also its hind legs.
18. The J____ is a member of the hare family. It has extra-large ears to help it keep cool, and long legs to help it move fast to escape predators.
19. The G____ is a member of the dog family. It is mainly nocturnal and eats rodents, fruits and seeds. It’s good at climbing trees, which helps it “outfox” its predators and prey!
20. A large gray, black and white bird that “cracks nuts” open with its bill. Clark’s N____
21. This is the largest bird in North America. It has black feathers and a naked pink head. The California C____ was almost extinct, but its numbers are slowly increasing. A few of these birds have been spotted in Bryce Canyon!
22. Once endangered, this bird of prey has pointed wings, a narrow tail, and dives at 200 miles an hour! Peregrine F____
23. The P____ D____ is member of the rodent family. It lives in burrows in small meadow “towns.” It often sits atop its mound and “barks” to warn others of danger.
24. The Great Horned O____ is a nocturnal bird whose call is a series of “hoots.” It has an almost silent flight because of its fluffy feathers.

**Down**

1. A dark blue bird with a black crest on its head. S____ Jay.
2. The R____ is a large, furry mammal which eats fruits, nuts, insects and small animals. Its name comes from a common color of its fur. In winter, it hibernates in a den with its cubs.
3. The R____ is a nocturnal predator from the raccoon family. Its name comes from its long, bushy tail which has black and white bands (or “rings”).
4. This large bird of prey is our national symbol. Bald E____
5. The M____ is a large member of the cat family who can weigh up to 175 pounds. It preys on deer, rabbits and other mammals. Other names include puma and cougar.
6. A large gray, white and black bird with a black cap, white breast and gray back. It is often seen climbing down tree trunks headfirst! White-breasted N____
7. This is the largest bird in North America. It has black feathers and a naked pink head. The California C____ was almost extinct, but its numbers are slowly increasing. A few of these birds have been spotted in Bryce Canyon!
8. Another name for this bird of prey is the Rocky Mountain Jay.
9. The W____ is a long, slender mammal with short legs. Its fur is tan in summer and white in winter, with a black tip on its tail.
10. A small gray bird, belonging to the Sparrow Family, often seen hopping on the ground picking up seeds. Dark-eyed J____
11. The C____ looks a lot like its cousin, the Golden-mantled Ground Squirrel, but it’s smaller and has stripes on its face.
12. M____ Deer can be seen at dusk and dawn, browsing in meadows and along roadsides. They get their name from their large ears.
13. The E____ is a member of the deer family and is the largest mammal at Bryce Canyon. Bulls are known for their loud “bugle.”
14. The F____ is a nocturnal predator from the raccoon family. Its name comes from its long, bushy tail which has black and white bands (or “rings”).
15. The P____ is a slow-moving mammal who eats tree bark and burrows in small meadow “towns.” It often sits atop its mound to warn others of danger.
16. The H____ is a tiny bird that eats nectar from red flowers. Its name comes from the sound made by its rapidly-beating wings.
17. This hoofed animal flew Perseus to rescue princess Andromeda from the sea monster. The constellation Andromeda is also its hind legs.
18. The J____ is a member of the hare family. It has extra-large ears to help it keep cool, and long legs to help it move fast to escape predators.
19. The G____ is a member of the dog family. It is mainly nocturnal and eats rodents, fruits and seeds. It’s good at climbing trees, which helps it “outfox” its predators and prey!
20. A large gray, black and white bird that “cracks nuts” open with its bill. Clark’s N____
21. This is the largest bird in North America. It has black feathers and a naked pink head. The California C____ was almost extinct, but its numbers are slowly increasing. A few of these birds have been spotted in Bryce Canyon!
22. Once endangered, this bird of prey has pointed wings, a narrow tail, and dives at 200 miles an hour! Peregrine F____
23. The P____ D____ is member of the rodent family. It lives in burrows in small meadow “towns.” It often sits atop its mound and “barks” to warn others of danger.
24. The Great Horned O____ is a nocturnal bird whose call is a series of “hoots.” It has an almost silent flight because of its fluffy feathers.

**Constellation Connect-the-Stars**

1. Orion the hunter
2. Pegasus the winged horse
3. Cygnus the swan
4. Hercules the strong man
5. Hercules the strong man

**Deep Sky Object**

1. Globular Star Cluster
2. Andromeda Galaxy
3. Double Star Albireo
4. Great Orion Nebula

Bryce Canyon is one of the darkest places in the world. On a moonless night you can see 2500 stars! All of these extra stars can make it hard to find constellations, but makes it easy to see galaxies, globular star clusters, nebulae, and other deep sky objects even with just binoculars.

**Connect the stars; enter the numbers from the lists below that correctly name each constellation.**

<table>
<thead>
<tr>
<th>Deep Sky Object</th>
<th>Constellation</th>
<th>Myth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Orion the hunter</td>
<td>Summer</td>
<td>1) Earth Goddess’s giant scorpion chases this trophy hunter every night, keeping him so busy he never has time to kill any more animals.</td>
</tr>
<tr>
<td>2. Pegasus the winged horse</td>
<td>Summer</td>
<td>2) He diverted two rivers to clean the stables of 3000 oxen, carried the world on his shoulders so Atlas could rest, and broke Zeus’s unbreakable chains to free Prometheus. His name means strength and power.</td>
</tr>
<tr>
<td>3. Cygnus the swan</td>
<td>Summer</td>
<td>3) This hoofed animal flew Perseus to rescue princess Andromeda from the sea monster. The constellation Andromeda is also its hind legs.</td>
</tr>
<tr>
<td>4. Hercules the strong man</td>
<td>Summer</td>
<td>4) Also called the Northern Cross, it swims the river in the sky called Milky Way. Its colorful head is nick-named the “Cub Scout Double Star.”</td>
</tr>
<tr>
<td>1. Great Orion Nebula</td>
<td>Summer</td>
<td></td>
</tr>
<tr>
<td>2. Hercules the strong man</td>
<td>Summer</td>
<td></td>
</tr>
<tr>
<td>3. Cygnus the swan</td>
<td>Summer</td>
<td></td>
</tr>
<tr>
<td>4. Pegasus the winged horse</td>
<td>Summer</td>
<td></td>
</tr>
<tr>
<td>1. Globular Star Cluster</td>
<td>Winter</td>
<td></td>
</tr>
<tr>
<td>2. Andromeda Galaxy</td>
<td>Winter</td>
<td></td>
</tr>
<tr>
<td>3. Double Star Albireo</td>
<td>Winter</td>
<td></td>
</tr>
<tr>
<td>4. Great Orion Nebula</td>
<td>Winter</td>
<td></td>
</tr>
<tr>
<td>1. Great Orion Nebula</td>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>2. Hercules the strong man</td>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>3. Cygnus the swan</td>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>4. Pegasus the winged horse</td>
<td>Spring</td>
<td></td>
</tr>
</tbody>
</table>
Bryce Canyon is one of the last grand sanctuaries of natural darkness. Here nocturnal animals thrive in a habitat free from light pollution. It isn’t easy protecting the night, because a little light can spoil lots of darkness. To save the night, Rangers need help from both park visitors and people who live far away.

Draw lines from each predator to its prey (some prey might have several predators).

Put an ‘X’ through anything that ruins night sky or nocturnal habitat.

Name the two constellations above: ___________________ & ___________________.

Circle the North Star (Polaris) in the constellations above. (Hint: Attend an astronomy program or ask a ranger for help.)

In the space below, name two things in the picture that need darkness and explain why. Write two things that spoil night sky or nocturnal habitat and describe how to fix them.

**What needs darkness? Why?**
1. ____________________________________________
2. ____________________________________________

**What spoils the dark? How can we fix it?**
1. ____________________________________________
2. ____________________________________________
Tree Rings Reveal the Past

Each year, trees add a new growth ring. Using “increment borers,” scientists extract cores from trees to learn about the past. Thin rings form during droughts. Thick rings grow during wet years. Because logs rot slowly in the desert, the rings of living trees can be matched with rings in trees that died long ago. The example logs and cores illustrated below represent 5 young Ponderosa Pines. The longest dendrochronology record goes back 12,000 years using Bristlecone Pines which can live thousands of years!

**Dendrochronology** (noun) First used by archeologists to age buildings, this science also studies what life was like in the past as it was experienced and recorded by trees.

**How did each tree die?**

(Place the correct letter in the blank next to each tree.)

A. Cut by a pioneer to make a cabin
B. Broken off in a wind storm
C. Burned by a severe forest fire
D. Attacked by bark beetles
E. Died during extreme drought

Instructions: Study the logs and their cores below to figure out what happened to the 5 dead trees they represent. Fill in the blanks where needed to create a tree sequence of time — a dendrochronology.

1. Look at the shape of the logs and the last rings on right end of the cores to determine how each tree died (see letter choices at left).
2. Count dark brown rings on the cores to determine the age of each tree when it died (count the rings to right of the pith which = year 0).
3. Compare the ring patterns to calculate the years of overlap shared between trees (count rings between blue dotted lines).
4. For a real challenge, try the bonus questions at bottom left page.

Hints:
1. It’s easier if you start with log/core #1 and work forward through time.
2. Don’t count fire scars (black wood) as ring years (brown lines).

**CORE #1**

Died at Age: __________
Year Died: 1870
Killed by: __________

**CORE #2**

Died at Age: __________
Year Died: 32
Killed by: __________

**CORE #3**

Died at Age: __________
Year Died: 44
Killed by: __________

**CORE #4**

Died at Age: __________
Year Died: 1965
Killed by: __________

**CORE #5**

Died at Age: __________
Year Died: 2001
Killed by: __________

---

**Bonuses**

**Dendrochronology:**

A. Together these 5 trees create a dendrochronology that spans _______ years.

( = total ages – total overlap)

B. Tree #____ grew fastest.
(a longer core but fewer rings)

C. Tree #____ grew slowest.
(smallest average gap between rings = # of rings ÷ core length)

**Fire and Drought:**

A. ____ droughts have occurred.
B. The longest drought began in _______.
C. ____ fires have occurred.
D. On average, a fire occurs about once every ____ years.

(length of dendrochronology ÷ # of fires)

---

**Note:** The activity on these two pages counts as **two** activities!
Each year trees add a new growth ring. Using “increment borers,” scientists extract cores from trees to learn about the past. Thin rings form during droughts. Thick rings grow during wet years. Because logs rot slowly in the desert, the rings of living trees can be matched with rings in trees that died long ago. The example logs and cores illustrated below represent 5 young Ponderosa Pines. The longest dendrochronology record goes back 12,000 years using Bristlecone Pines which can live thousands of years.

**dendrochronology** (noun) First used by archeologists to age buildings, this science also studies what life was like in the past as it was experienced and recorded by trees.

**Instructions:** Study the logs and their cores below to figure out what happened to the 5 dead trees they represent. Fill in the blanks where needed to create a tree sequence of time — a dendrochronology.

1. Look at the shape of the logs and the last rings on right end of the cores to determine **how each tree died** (see letter choices at left).
2. Count dark brown rings on the cores to determine the **age of each tree** when it died (count the rings to right of the pith which = year 0).
3. Compare the ring patterns to calculate the **years of overlap** shared between trees (count rings between blue dotted lines).
4. For a real challenge, try the bonus questions at bottom left page.

**Hints:**
1. It’s easier if you start with log/core #1 and work forward through time.
2. Don’t count fire scars (black wood) as ring years (brown lines).

**Bonus #1 Dendrochronology:**
A. Together these 5 trees create a dendrochronology that spans _______ years.
( = total ages – total overlap)
B. Tree # ______ grew fastest.
(a longer core but fewer rings)
C. Tree # ______ grew slowest.
(smallest average gap between rings = # of rings ÷ core length)

**Bonus #2 Fire and Drought:**
A. _____ droughts have occurred.
B. The longest drought began in _______.
C. _____ fires have occurred.
D. On average, a fire occurs about once every _____ years.
(length of dendrochronology ÷ # of fires)

---

**LOG #1**
- Died at Age: ______
- Year Died: 1870
- Killed by: ______
- Core length: 9.8 cm
- # YEARS OVERLAP: 13

**CORE #1**
- Died at Age: ______
- Year Died: 1870
- Killed by: ______
- Core length: 9.8 cm

**LOG #2**
- Died at Age: ______
- Year Died: ______
- Killed by: ______
- Core length: 8.3 cm

**CORE #2**
- Died at Age: ______
- Year Died: 32
- Killed by: ______
- Core length: 8.3 cm

**LOG #3**
- Died at Age: ______
- Year Died: ______
- Killed by: ______
- Core length: 10.0 cm

**CORE #3**
- Died at Age: ______
- Year Died: ______
- Killed by: ______
- Core length: 10.0 cm

**LOG #4**
- Died at Age: ______
- Year Died: 1965
- Killed by: ______
- Core length: 11.3 cm

**CORE #4**
- Died at Age: ______
- Year Died: 1965
- Killed by: ______
- Core length: 11.3 cm

**LOG #5**
- Died at Age: ______
- Year Died: 2001
- Killed by: ______
- Core length: 9.5 cm

**CORE #5**
- Died at Age: ______
- Year Died: 2001
- Killed by: ______
- Core length: 9.5 cm

---

**Note:** The activity on these two pages counts as **TWO activities!**
Bryce Canyon is one of the last grand sanctuaries of natural darkness. Here nocturnal animals thrive in a habitat free from light pollution. It isn’t easy protecting the night, because a little light can spoil lots of darkness. To save the night, Rangers need help from both park visitors and people who live far away.

Draw lines from each predator to its prey (some prey might have several predators).

Put an ‘X’ through anything that ruins night sky or nocturnal habitat.

Name the two constellations above: ___________________ & ___________________

Circle the North Star (Polaris) in the constellations above. (Hint: Attend an astronomy program or ask a ranger for help.)

In the space below, name two things in the picture that need darkness and explain why. Write two things that spoil night sky or nocturnal habitat and describe how to fix them.

What needs darkness? Why?
1. ____________________________
2. ____________________________

What spoils the dark? How can we fix it?
1. ____________________________
2. ____________________________
Using the information provided, test your knowledge of Bryce Canyon’s wildlife by completing this puzzle. For clues, attend a ranger program, look in the visitor center museum or the Hoodoo newspaper!

Across

1. The Violet-green S ___ catches and “swallows” insects as it flies among the rock pinnacles.
2. The B ___ is a mammal with yellow-gray fur and a white stripe like a “badge”) across the top of its head. It uses its long claws to dig out rodents to eat.
3. The R ___ is a large black bird, cousin to the crow, with a call that sounds like a “croak.”
4. The R ___ is a nocturnal predator from the raccoon family. Its name comes from a common color of its fur.
5. The M ___ L ___ is a large member of the cat family who can weigh up to 175 pounds. It preys on deer, rabbits and other mammals.
6. The P ___ B ___ is a large, furry mammal which eats fruits, nuts, and small animals. Its name comes from a common color of its fur.
7. The S ___ is a small, black and white nocturnal (active at night) animal that defends itself with a powerful, smelly scent it sprays from glands beneath its tail.
8. A four-legged, fast-moving reptile, the L ___.
9. The W ___ is a long, slender mammal with short legs. Its fur is tan in summer and white in winter, with a black tip on its tail.
10. A small gray bird, belonging to the Sparrow Family, often seen hopping on the ground picking up seeds. Dark-eyed J ___.
11. The C ___ looks a lot like its cousin, the Golden-mantled Ground Squirrel, but it’s smaller and has stripes on its face.
12. M ___ Deer can be seen at dusk and dawn, browsing in meadows and along roadways. They get their name from their large ears.
13. The E ___ is a member of the deer family and is the largest mammal at Bryce Canyon. Bulls are known for their loud “bugle.”
14. The R ___ is a four-legged, fast-moving reptile, the L ___.
15. A small, plump bird with a black cap, white breast and gray back. It is often seen climbing down tree trunks headfirst! White-breasted N ___.
16. This chubby, striped rodent is always begging for food, even though human food is unhealthy and there are plenty of natural things to eat. Golden-mantled Ground S ___.
17. A large gray, black and white bird that “cracks nuts” open with its bill. Clark’s N ___.
18. Once endangered, this bird of prey has pointed wings, a narrow tail, and dives at 200 miles an hour! Peregrine E ___.
19. The P ___ D ___ is member of the rodent family. It lives in burrows in small meadow “towns.” It often sits atop its mound and “barks” to warn others of danger.
20. On summer evenings, this flying mammal swarms out of cave entrances and eats many insects. Little Brown B ___.

Down

1. A dark blue bird with a black crest on its head. S ___ Jay.
2. The B ___ B ___ is a large, furry mammal which eats fruits, nuts, insects and small animals. Its name comes from a common color of its fur. In winter, it hibernates in a den with its cubs.
3. The R ___ is a nocturnal predator from the raccoon family. Its name comes from its long, bushy tail which has black and white bands (or “rings”).
4. This large bird of prey is our national symbol. Bald E ___.
5. The M ___ L ___ is a large member of the cat family who can weigh up to 175 pounds. It preys on deer, rabbits and other mammals.
6. The P ___ is a slow-moving mammal who eats tree bark and defends itself with sharp quills.
7. The C ___ is a member of the dog family. It’s known for its howling and yipping sounds.
8. The J ___ is a member of the hare family. It has extra-large ears to help it keep cool, and long legs to help it move fast to escape predators.
9. The G ___ is a tiny bird that eats nectar from red flowers. Its name comes from the sound made by its rapidly-beating wings.
10. A large gray, black and white bird that “cracks nuts” open with its bill. Clark’s N ___.
11. This is the largest bird in North America. It has black feathers and a naked pink head. The California C ___ was almost extinct, but its numbers are slowly increasing. A few of these birds have been spotted in Bryce Canyon!
12. The J ___ is a member of the hare family. It has extra-large ears to help it keep cool, and long legs to help it move fast to escape predators.
13. The G ___ is a member of the dog family. It is mainly nocturnal and eats rodents, fruits and seeds. It’s good at climbing trees, which helps it “outfox” its predators and prey!
14. The H ___ is a tiny bird that eats nectar from red flowers. Its name comes from the sound made by its rapidly-beating wings.
15. Also called the Northern Cross, it swims the river in the sky called Milky Way. Its colorful head is nicknamed the “Cub Scout Double Star.”

Bryce Canyon is one of the darkest places in the world. On a moonless night you can see 2500 stars! All of these extra stars can make it hard to find constellations, but makes it easy to see galaxies, globular star clusters, nebulae, and other deep sky objects even with just binoculars.

Connect the stars; enter the numbers from the lists below that correctly name each constellation. Connect the stars; enter the numbers from the lists below that correctly name each constellation, its famous deep sky object (see photographs), and its mythology.

<table>
<thead>
<tr>
<th>Constellation Connect-the-Stars</th>
<th>Myth</th>
<th>Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orion the hunter</td>
<td>Earth Goddess’s giant scorpion chases this trophy hunter every night, keeping him so busy he never has time to kill any more animals.</td>
<td></td>
</tr>
<tr>
<td>Pegasus the winged horse</td>
<td>He diverted two rivers to clean the stables of 3000 oxen, carried the world on his shoulders so Atlas could rest, and broke Zeus’s unbreakable chains to free Prometheus. His name means strength and power.</td>
<td></td>
</tr>
<tr>
<td>Cygnus the swan</td>
<td>This hoofed animal flew Perseus to rescue princess Andromeda from the sea monster. The constellation Andromeda is also its hind legs.</td>
<td></td>
</tr>
<tr>
<td>Hercules the strong man</td>
<td>Also called the Northern Cross, it swims the river in the sky called Milky Way. Its colorful head is nicknamed the “Cub Scout Double Star.”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deep Sky Object</th>
<th>Myth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Globular Star Cluster</td>
<td></td>
</tr>
<tr>
<td>Andromeda Galaxy</td>
<td></td>
</tr>
<tr>
<td>Double Star Albireo</td>
<td></td>
</tr>
<tr>
<td>Great Orion Nebula</td>
<td></td>
</tr>
</tbody>
</table>
Some of the animals in Bryce Canyon are rarely seen, but we know they are here because they leave footprints or other signs behind. Use your knowledge of these animals to try to match them to their tracks!

- Match at least five animals to their tracks.
- Match all animals to their tracks.

Attend a Geology Talk, watch the park movie, or look in the visitor center for clues! Answer the questions below and complete all the parts to finish this activity.

1) What mineral gives our rocks their red color? ______________

2) Why is Bryce Canyon not really a canyon? __________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

The wonders of Bryce Canyon inspire many artists, photographers, writers, and poets. Haiku is an easy form of Japanese poetry that contains only 3 lines. The first and third lines have 5 syllables (or beats) and the second has 7. Think of something that you found inspiring about Bryce Canyon and write your own Haiku! Below are some examples to help you get started:

- Beautiful red spires
- Reaching for the deep blue sky
- How long can they last?

- In the dark of night
- I marvel at brilliant stars
- In the Milky Way!

Did you know?

After Bryce Canyon's rocks were formed, weathering and erosion began sculpting the rocks into strange-looking pinnacles called hoodoos. From the words below, circle all the sources of erosion that are NOW carving Bryce Canyon's hoodoos.

- rain
- tornadoes
- bulldozers
- hurricanes
- tree roots
- chipmunks
- fish
- ice
- wind
- people

Inspiring Words

The wonders of Bryce Canyon inspire many artists, photographers, writers, and poets. Haiku is an easy form of Japanese poetry that contains only 3 lines. The first and third lines have 5 syllables (or beats) and the second has 7. Think of something that you found inspiring about Bryce Canyon and write your own Haiku! Below are some examples to help you get started:

- Beautiful red spires
- Reaching for the deep blue sky
- How long can they last?

- In the dark of night
- I marvel at brilliant stars
- In the Milky Way!
The drawing below shows geologic layers of rock. Geologists call this a stratigraphic column. On the left side of the column are the rocks’ names and descriptions.

**This activity has two parts. Completing both parts counts as one activity.**

1. **Label the Layers**

   - Use the rock symbols to label all of the rock layers.

   ![Stratigraphic Column Diagram]

2. **Create a Hoodoo**

   - **Hoodoo:** noun.
   - A pinnacle or odd-shaped rock left standing from the forces of weathering and erosion.

   Draw and label a hoodoo in the space at left. Use at least two different rock types from the stratigraphic column and rock symbols as shown above.

   Draw and label a hoodoo in the space at left. Use at least four different rock types from the stratigraphic column and rock symbols as shown above. Show different thicknesses and hardnesses of rock in your hoodoo.

   ![Hoodoo Diagram]

---

The Southern Paiute Indians lived in the Bryce Canyon area for centuries during Spring, Summer, and Fall. They were experts in using many different resources in order to eat, build shelters, make clothing, pieces of art, and tools for gathering food and collecting water. Read about the Southern Paiute Indians in the text box, then answer the question (in red) below.

**Food:** Southern Paiutes ate many things, including: jackrabbit (ku’moo), pronghorn (wunts), sego lily (kogge), pinenuts (too’vuts), and crickets (awdung’kupeets).

**Home:** They used small domed shelters known as kahns when they needed temporary shelter. Kahns were made of branches, bark, and grasses.

**Method of Travel:** On foot (nampa).

**Clothing:** They wore clothing made of animal hides and sometimes plants. Men wore clothing known as madooha koosa and women wore clothing called kumoo’muhdo’e.

**Art:** Southern Paiutes are known for their beautiful baskets (yuh’up) which were woven from twigs and reeds. Baskets were used to gather nuts and berries and to carry water.

---

Everything the Southern Paiutes used came from nature. Even today, every man-made item we possess is made from natural materials. Can you name 5 man-made items you own and the natural materials they came from?

1) 
2) 
3) 
4) 
5)
As you explore Bryce Canyon, look for the things shown below. When you see one of the items, draw a circle around it. Try to get 5 in a row (horizontally, vertically, or diagonally) to finish this activity. Can you find them all?

- Moon
- Columbine
- Steller’s Jay
- Evening Primrose
- Golden-mantled Ground Squirrel
- Ranger Hat
- Pine cone
- Mule Deer
- Violet-Green Swallow
- Lightning
- Pronghorn
- Short-horned Lizard
- Butterfly
- Aspen
- Hoodoos
- Shuttle
- Manzanita
- Raven
- Bryce Canyon Lodge
- The Milky Way
- Table Cliff Plateau
- Bench Mark

**Bryce Canyon Bingo**

Note: The activity on these two pages counts as TWO activities!

---

### DIET

<table>
<thead>
<tr>
<th>Food Item, one serving</th>
<th>CO2 (lbs)</th>
<th>Times per wk</th>
<th>Total CO2 per wk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eggs, scrambled</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacon or sausage</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toast with butter &amp; jam</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pancakes/waffles with syrup</td>
<td>2.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cereal with milk</td>
<td>2.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot dog with bun</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peanut butter &amp; jelly sandwich</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuna fish sandwich</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheeseburger</td>
<td>6.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey burger</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veggie burger</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spaghetti &amp; meatballs</td>
<td>3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macaroni &amp; cheese</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pizza with meat, 1 slice</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pizza no meat, 1 slice</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish sticks</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salmon, fresh wild regional</td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken tenders</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>French Fries</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salad (garden)</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruits/vegetables</td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yogurt with fruit</td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuts</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ice cream, 2 scoops</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slice of cake or 2 cookies</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tap water</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottled water</td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soda pop</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange Juice</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Carbon Footprint from Food:**

Next, add the four CO2 lifestyle totals from 1, 2, 3, and 4. Write the sum here:

This is your Carbon Footprint for ONE WEEK. Multiply the weekly number by 52 for your YEARLY total.

**Home Carbon Footprint (per bedroom):**

- Heat with wood/pellet stove*: 100
- Heat with natural gas/LPG furnace: 300
- Heat with electric furnace: 500
- Cool with air conditioning*: 125
- Cool with evaporative cooler or fans*: 25
- Cool/Heat with wind/solar electricity: 0

**Total Carbon Footprint Reduction:**

FINALLY, my ADJUSTED yearly CO2 total is:

- 5 + 6 = ___________ lbs CO2
- (divided by 2000) = ___________ tons CO2

**Home Energy Conservation:**

- Turn off water while brushing teeth (2 mins) -275
- Replace 10 light bulbs with CFL bulbs -650
- Replace 10 light bulb with LED bulb -750
- Recycle all paper -105
- Recycle glass -10
- Recycle plastics -20
- Recycle aluminum & steel cans -85
- Using Energy Star™ appliances -500

**Total Carbon Footprint Reduction:**

**BONUS: What Else Can You Do?**

- Eating less meat & dairy reduces carbon footprint.
- Double-pane windows, extra insulation & weatherstripping can reduce CO2.
- Energy saving bulbs also last MUCH longer!
- Eating less meat & dairy reduces carbon footprint.
- The best thing to do is use LESS fossil fuel energy.
- Planting trees helps, but not as much as you think.
- One tree “eats” about 50 pounds of CO2 per year.
- How many trees would you have to plant to offset your carbon footprint? (Divide your adjusted yearly lbs of CO2 total by 50.)

**Can you plant enough Trees?**

Write your answer here: __________

---

**HOME (Heating & Cooling)**

<table>
<thead>
<tr>
<th>Months per yr</th>
<th>CO2 (lbs)</th>
<th>CO2 per yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat with wood/pellet stove*</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Heat with natural gas/LPG furnace</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Heat with electric furnace</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Cool with air conditioning*</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>Cool with evaporative cooler or fans*</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Cool/Heat with wind/solar electricity</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Home Energy Conservation:**

- Turn off water while brushing teeth (2 mins) -275
- Replace 10 light bulbs with CFL bulbs -650
- Replace 10 light bulb with LED bulb -750
- Recycle all paper -105
- Recycle glass -10
- Recycle plastics -20
- Recycle aluminum & steel cans -85
- Using Energy Star™ appliances -500

**Total Carbon Footprint Reduction:**

FINALLY, my ADJUSTED yearly CO2 total is:

- 5 + 6 = ___________ lbs CO2
- (divided by 2000) = ___________ tons CO2

**BONUS: What Else Can You Do?**

- The best thing to do is use LESS fossil fuel energy.
- Planting trees helps, but not as much as you think.
- One tree “eats” about 50 pounds of CO2 per year.
- How many trees would you have to plant to offset your carbon footprint? (Divide your adjusted yearly lbs of CO2 total by 50.)

**Can you plant enough Trees?**

Write your answer here: __________
“I think that climate change is the greatest threat to the integrity of the National Park System that we have ever faced.”

~ Jon Jarvis, National Park Service Director

Carbon dioxide (CO₂) traps heat. The best way to stop Global Climate Change is to reduce CO₂ emissions. Did you know that by using less energy, getting more exercise, and eating healthy food you can help protect national parks and the whole world? After you make all the calculations below, look for ways to lower your carbon footprint and then stick to that plan! Then invite your friends and family to do same.

What’s Your Carbon Footprint?

Your “carbon footprint” is the total amount of CO₂ you create from the way you live. A big carbon footprint is bad for the planet. In the charts below and on the facing page, find the lifestyle and food choices that are closest to the real ones you make during an average week. Add annual home heat/cooling and then subtract Energy Conservation. Hint: A calculator makes this MUCH easier!

Average Person’s Carbon Footprints From Around the World (tons/year)

<table>
<thead>
<tr>
<th>Country</th>
<th>CO₂ (tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>20.0</td>
</tr>
<tr>
<td>Germany</td>
<td>17.8</td>
</tr>
<tr>
<td>UK</td>
<td>15.9</td>
</tr>
<tr>
<td>Italy</td>
<td>13.4</td>
</tr>
<tr>
<td>France</td>
<td>12.1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>10.4</td>
</tr>
<tr>
<td>Brazil</td>
<td>6.2</td>
</tr>
<tr>
<td>China</td>
<td>8.3</td>
</tr>
<tr>
<td>Japan</td>
<td>9.5</td>
</tr>
<tr>
<td>Korea</td>
<td>6.2</td>
</tr>
<tr>
<td>Israel</td>
<td>9.8</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>18.6</td>
</tr>
<tr>
<td>Australia</td>
<td>13.2</td>
</tr>
<tr>
<td>India</td>
<td>3.7</td>
</tr>
<tr>
<td>Mexico</td>
<td>5.7</td>
</tr>
<tr>
<td>Canada</td>
<td>16.2</td>
</tr>
<tr>
<td>Russia</td>
<td>11.7</td>
</tr>
<tr>
<td>South Africa</td>
<td>9.5</td>
</tr>
<tr>
<td>Kenya</td>
<td>5.7</td>
</tr>
<tr>
<td>Israel</td>
<td>9.8</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>18.6</td>
</tr>
<tr>
<td>Average Global</td>
<td>4.6</td>
</tr>
</tbody>
</table>

~ HYGIENE ~

- Taking a shower: 1.3 CO₂ (lbs) per wk
- Taking a bath: 2.5 CO₂ (lbs) per wk
- 6 minutes of hair drying: 1.3 CO₂ (lbs)
- Washing 1 load of laundry: 2.4 CO₂ (lbs)
- Drying 1 load of laundry: 3.3 CO₂ (lbs)
- Using dishwasher (1 load): 2.9 CO₂ (lbs)

Total Carbon Footprint from Hygiene: 1

~ TRANSPORTATION ~

- Walking, bicycling, skateboarding: 0.0 CO₂ (lbs) per mi
- Electric Car (50% Coal electricity): 0.2 CO₂ (lbs) per mi
- Bus (School or Metro, Train/Subway): 0.3 CO₂ (lbs) per mi
- Hybrid Car (40mpg): 0.4 CO₂ (lbs) per mi
- Car (40mpg): 0.5 CO₂ (lbs) per mi
- Car (20mpg): 1.0 CO₂ (lbs) per mi
- Jet Plane (1000-mile segment): 13.5 CO₂ (lbs)
- Bullet Train (1000-mile segment): 2.1 CO₂ (lbs)

Total Carbon Footprint from Transportation: 2

~ FUN ACTIVITY ~

- Watching TV: 1.4 CO₂ (lbs) per hr
- Video game (includes TV): 2.0 CO₂ (lbs) per hr
- Desktop Computer: 1.4 CO₂ (lbs) per hr
- Laptop Computer: 0.7 CO₂ (lbs) per hr
- Reading, board/card games: 0.3 CO₂ (lbs) per hr
- Hiking, bicycling, swimming, canoeing, snowshoeing: 0.0 CO₂ (lbs) per hr
- ATV, Boating, Snowmobiling: 6.2 CO₂ (lbs) per hr

Total Carbon Footprint from Fun: 3

The more water you use, and the hotter the water is, the bigger your carbon footprint.

Fun can have a big carbon footprint when electricity and/or fossil fuels are used!

Using mass transit is even better than a hybrid car!

Are you ready for adventure? Take the “I Hiked the Hoodoos” challenge! This activity is for visitors of ALL ages, and allows you to explore Bryce Canyon’s trails, have fun, and get healthy at the same time.

To meet the challenge, you must do BOTH of these:

1. Hike a minimum of 3 miles/4.8 km on trails that have special “I Hiked the Hoodoos!” benchmarks as shown at right (see chart below).
2. Use the back page of this booklet to make pencil rubbings of the benchmarks. Bring the rubbings (or if you prefer, photos of yourself with the benchmarks) to the visitor center to receive a small reward. Also, this activity counts as a Junior Ranger Booklet requirement if you answer the question (#4) in the box on the back page.

Benchmark locations are designated on the maps below by the : More detailed trail information and further instructions about the “Hike the Hoodoo” activity can be found in the park newspaper, The Hoodoo.

Benchmark
<table>
<thead>
<tr>
<th>Distance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miles</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1. Mossy Cave</td>
</tr>
<tr>
<td>2. Rim Trail</td>
</tr>
<tr>
<td>3. Tower Bridge</td>
</tr>
<tr>
<td>4. Queens Garden</td>
</tr>
<tr>
<td>5. Navajo Loop</td>
</tr>
<tr>
<td>6. Peekaboo Loop (from Sunset Point)</td>
</tr>
<tr>
<td>7. Wall of Windows (from Bryce Point)</td>
</tr>
<tr>
<td>8. Sheep Creek</td>
</tr>
<tr>
<td>9. Bristlecone Loop</td>
</tr>
</tbody>
</table>

Trail difficulty: Easy, Moderate, Strenuous *round trip

Protecting Parks from Your Home

Are you ready for adventure? Take the “I Hiked the Hoodoos” challenge! This activity is for visitors of ALL ages, and allows you to explore Bryce Canyon’s trails, have fun, and get healthy at the same time.

To meet the challenge, you must do BOTH of these:

1. Hike a minimum of 3 miles/4.8 km on trails that have special “I Hiked the Hoodoos!” benchmarks as shown at right (see chart below).
2. Use the back page of this booklet to make pencil rubbings of the benchmarks. Bring the rubbings (or if you prefer, photos of yourself with the benchmarks) to the visitor center to receive a small reward. Also, this activity counts as a Junior Ranger Booklet requirement if you answer the question (#4) in the box on the back page.

Benchmark locations are designated on the maps below by the : More detailed trail information and further instructions about the “Hike the Hoodoo” activity can be found in the park newspaper, The Hoodoo.

Benchmark
<table>
<thead>
<tr>
<th>Distance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miles</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1. Mossy Cave</td>
</tr>
<tr>
<td>2. Rim Trail</td>
</tr>
<tr>
<td>3. Tower Bridge</td>
</tr>
<tr>
<td>4. Queens Garden</td>
</tr>
<tr>
<td>5. Navajo Loop</td>
</tr>
<tr>
<td>6. Peekaboo Loop (from Sunset Point)</td>
</tr>
<tr>
<td>7. Wall of Windows (from Bryce Point)</td>
</tr>
<tr>
<td>8. Sheep Creek</td>
</tr>
<tr>
<td>9. Bristlecone Loop</td>
</tr>
</tbody>
</table>

Trail difficulty: Easy, Moderate, Strenuous *round trip.
“Hike the Hoodoos” (continued)

1. Benchmark rubbing
2. Benchmark rubbing
3. Benchmark rubbing
4. What is one thing you learned from reading one of the “Hike the Hoodoos” panels?

You MUST attend at least one Bryce Canyon Ranger Program.

Ages 6-10: Complete 4 activities with this symbol:
Ages 11-17: Complete 5 activities with this symbol:
Ages 18+: Complete ALL activities in booklet.

Write something you learned from the program (details please!).

Using enclosed glove, pick up and dispose of at least 10 pieces of litter.

Note: The activities on pages 2-3 and 8-9 count as TWO activities each!

Available to Junior Rangers who meet all program requirements FREE to Junior Rangers who meet all program requirements

Bryce Canyon’s Junior Ranger Program is funded by a generous donation from the Bryce Canyon Natural History Association.

Junior Ranger Pledge
As a Bryce Canyon Junior Ranger, I promise to do all I can to help protect our national parks. I will collect litter when I’m out exploring, and show respect for nature by not disturbing anything wild.

_____________________________________________               _____________________
Junior Ranger’s Signature       Date

04-2015  10K