



The Mini Page

Betty Debnam, Founding Editor and Editor at Large

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The Night Sky

A Light Problem

Are you a stargazer? Whether you're a beginning astronomer or just like to enjoy the twinkling stars, you've probably noticed that you can see more of them when you're away from towns and cities.

Imagine living 300 years or so ago. Homes and businesses were lit by candles or gas flames. When you didn't need the light, you **extinguished**, or put out, the flame.

Today we let lights burn all night — streetlights, porch lights, office lights — even when we don't need the illumination. Scientists call this **light pollution**.

This week, The Mini Page learns more about light pollution and how it affects humans and animals.

Not all lights are pollution

Modern humans need artificial light. It allows us to work indoors and throughout the day and night. Imagine hospital workers trying to take care of sick people without artificial light. How well do you think people could drive cars without streetlights and headlights showing the road?

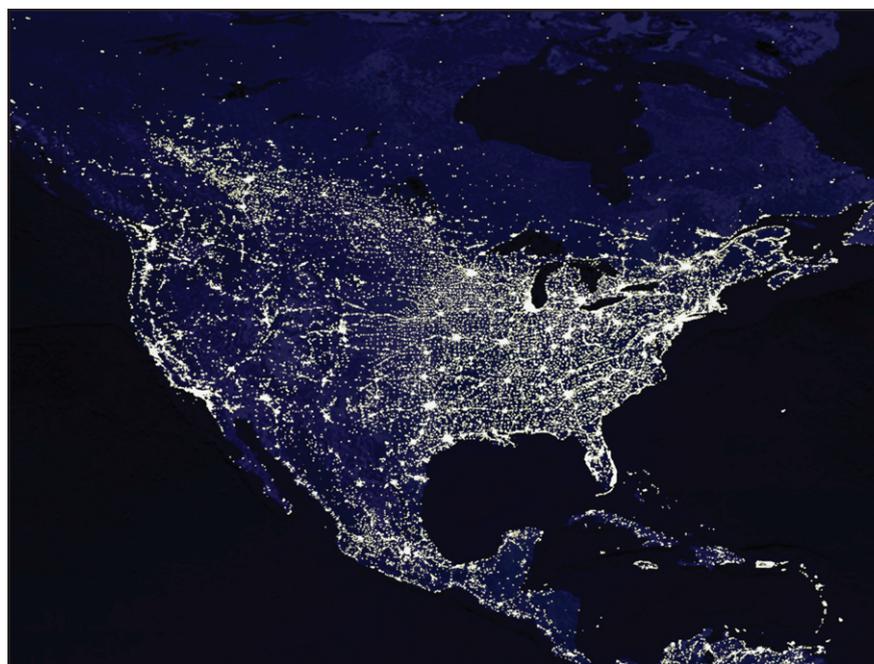


photo courtesy NASA/Goddard Space Flight Center Scientific Visualization Studio

Human-made lights highlight more developed or populated areas of the Earth's surface, including large cities in the United States.

Can you identify cities across the U.S. by looking at this nighttime photo from satellites flying through space?

Discuss with your family or class why so many cities are clustered along the coasts and major rivers.

What is light pollution?

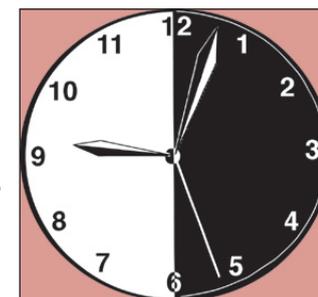
The International Dark-Sky Association works to reduce light pollution. It defines light pollution as any negative effect of artificial light, including light that creates sky glow, glare, light trespass, light clutter, bad visibility at night and energy waste.

- **Sky glow** is the brightening of the night sky over cities.
- **Light trespass** is light falling where it's not needed or wanted.
- **Glare** is too much brightness.
- **Light clutter** is bright and confusing groupings of lights.

Natural light

As the Earth turns, people and animals experience hours of light from the sun and hours of darkness,

when our part of the planet is turned away from the sun. As humans were evolving, these changes in light affected when people slept, when they worked and how they felt. These are called **circadian** rhythms. (Circadian means a 24-hour period.)



Too Much Light

Confusing our bodies

On a sunny day, when you're in school, the light inside your classroom may not be as bright as the light outside. But in the evening, when it's dark outside, we have bright lights on indoors. This artificial lighting confuses our bodies and their circadian rhythms.

When these natural cycles become too unbalanced, it makes it difficult for people to fight off cancer and other diseases.

Wasting energy

Have adults ever reminded you to turn off the lights when you leave a room — and then left a porch light on all night? Some people feel safer when lights are on, but experts say evidence shows that bright outdoor lights don't reduce crime.

One study showed that light trespass from U.S. streetlights alone wasted \$2.2 billion in energy costs over a one-year period.



photo courtesy National Park Service

This newly hatched green sea turtle is making its way to the ocean. Baby sea turtles that become confused by artificial lights may be eaten by other animals or run over by cars. All sea turtles that live in U.S. waters are either endangered or threatened species.

Animal habits

Artificial lights can be particularly harmful to animals. Whether they're active during the day (**diurnal**) or at night (**nocturnal**), all animals need a period of darkness.

Birds that migrate at night, for example, may be attracted to brightly lighted tall buildings and fly into them. Some birds will fly into a searchlight's beam and become disoriented, continuing to swirl in the light until they die of exhaustion.

Newly hatched sea turtles are born on the beach, usually at night. Their first instinct is to find the ocean. They do this by looking for the reflection of starlight and moonlight on the waves.

But when well-lighted homes, buildings, parking lots and streets are nearby, the baby turtles can become confused and move away from the water. If they don't make it to the ocean, they're likely to die.

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Ready Resources



The Mini Page provides ideas for websites, books or other resources that will help you learn more about this week's topics.

On the Web:

- nps.gov/guis/naturescience/sea-turtles.htm
- kids.nationalgeographic.com/kids/stories/spacescience/lightpollution

At the library:

- "There Once Was a Sky Full of Stars" by Bob Crelin
- "Once Upon a Starry Night: A Book of Constellations" by Jacqueline Mitton

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The News
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Light Pollution TRY 'N FIND

Words that remind us of light pollution are hidden in the block below. Some words are hidden backward or diagonally, and some letters are used twice. See if you can find: ANIMALS, ASTRONOMY, CIRCADIAN, CITIES, CLUTTER, DARK, DIURNAL, ENERGY, EXTINGUISH, GLARE, GLOW, HUMAN, ILLUMINATION, LIGHT, NOCTURNAL, ORDINANCE, POLLUTION, SKY, STARS.



W	J	F	H	S	I	U	G	N	I	T	X	E	N	B
R	E	T	T	U	L	C	A	C	E	N	C	S	O	D
P	O	L	L	U	T	I	O	N	A	N	W	R	C	I
E	S	D	G	I	D	V	E	M	A	O	Y	A	T	U
R	E	B	A	A	G	R	U	N	L	K	W	T	U	R
A	I	K	C	R	G	H	I	G	S	Q	D	S	R	N
L	T	R	Z	Y	K	D	T	S	L	A	M	I	N	A
G	I	A	S	T	R	O	N	O	M	Y	X	C	A	L
C	C	O	N	O	I	T	A	N	I	M	U	L	L	I

Mini Spy . . .



Mini Spy and Rookie Cookie like to camp out and see the stars. See if you can find:

- ice cream cone
- flyswatter
- needle
- elf
- fish
- heart
- snail
- number 7
- muffin
- word MINI
- number 6
- kite
- ladder
- sock
- shark
- banana
- pencil
- cherry
- hammer
- man in the moon
- two envelopes



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Rookie Cookie's Recipe Strawberry Yogurt Parfait

You'll need:

- 2 tablespoons brown sugar
- 1/2 teaspoon vanilla extract
- 2 (6-ounce) containers of low-fat vanilla yogurt
- 3 cups fresh strawberries, hulled and sliced
- 1/4 cup granola

What to do:

1. Mix brown sugar and vanilla extract into vanilla yogurt. Stir well to blend flavors.
2. Divide half of strawberries among 4 dessert dishes. Spoon half of yogurt mixture over strawberries.
3. Layer again with strawberries and yogurt mixture.
4. Top with granola.
5. Chill until ready to serve.

You will need an adult's help with this recipe.



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Meet Bridgit Mendler



photo by Rick Rowell, courtesy The Disney Channel

Bridgit Mendler stars as Teddy in the Disney Channel movie "Good Luck Charlie, It's Christmas!" She acts in the same role in the series "Good Luck Charlie." She is also a singer and songwriter, and co-wrote the theme song for this movie, called "I'm Gonna Run to You."

Bridgit starred in the Disney Channel movie "Lemonade Mouth." She has appeared in several TV shows, including "Wizards of Waverly Place" and "Jonas." She acted in the movie "Alvin and the Chipmunks: The Squeakquel." She wrote and sang the song "This Is My Paradise" for the movie "Beverly Hills Chihuahua 2."

Bridgit, 19, was born in Washington, D.C. When she was 8, she attended an acting camp. Soon after, she began acting and singing in the San Francisco Bay area. She began acting in a TV soap opera when she was 13. She enjoys reading, cooking and songwriting.

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Especially for kids and their families

The Mini Page

By BETTY DEBAM

Big Sky Country Montana From A to Z

Montana's name comes from the Spanish word for mountain. But only the western half actually has the Rocky Mountains.

The rest is made up of wide-open plains, giving the state the nickname "Big Sky Country."

It is the 4th largest state in area, but it is the 4th largest in population, with only about 960,000 people. The largest city, Billings, has about 101,000 people. The capital is Helena.

Mining has been important since the 1800s. Gold discovered in 1892 brought in thousands of people. There are also big deposits of copper, silver, lead, tungsten, platinum, zinc, oil and coal.

The United States bought most of Montana from France in 1803 as part of the Louisiana Purchase. It got the rest in 1846 in a treaty with Britain. Montana became a state in 1889.

Agriculture is the top industry. Cattle, wheat, barley, dairy products, sugar beets, hay, beans and sheep are important.

Little Bighorn Battlefield National Monument is the site of Custer's Last Stand, the 1876 Sioux and Cheyenne Indian victory over Lt. Col. George Armstrong Custer and the U.S. Army.

The Bitterroot is the state flower.

Coal deposits are the biggest in the U.S.

Glacier National Park has more than 1 million acres of wilderness, with more than 50 glaciers and snow-capped mountains all over the park.

Letta McDonald is the youngest of the 220 stars in the park.

Site to see: www.montana.gov (info)

Rocky Mountain: The Divide is an imaginary line that separates the flow of our nation's rivers. On one side the rivers flow east into the Atlantic Ocean. On the other side, rivers flow west into the Pacific.

Disaster: Insects from more than 45 species have been found there, including Stenogramma, Tyromyces and Tyromyces.

The biggest herds of moose in North America live in Montana.



MIGHTY FUNNY'S Mini Jokes

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All the following jokes have something in common. Can you guess the common theme or category?



Lisa: Why didn't the teacher call on the light bulb in class?

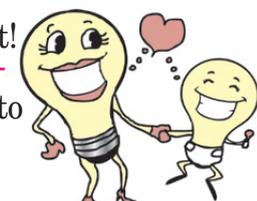
Lonny: Because it was too dim!

Leonard: How was Thomas Edison able to invent the light bulb?

Lester: Because he was so bright!

Laura: What did the baby light bulb say to its parents?

Lou: "I wuv you watts and watts!"



Seeing the Light



photos by Scott Kardel, IDA

At this observatory in California, some of the sky's features are hidden by sky glow from nearby Temecula, Calif. New observatories are built far away from populated areas.

Looking beyond

All through history, “the sky has inspired art, science, literature, religion,” said Scott Kardel, managing director of the International Dark-Sky Association. “We now have two generations of kids who don’t know how amazing the sky is — and so don’t know it needs protecting.”

Professional astronomers can move away from cities with lots of lights. In fact, telescopes are now built in remote areas of Chile and Hawaii. We even have telescopes in space.

But amateur astronomers are finding it harder to see the millions of stars that fill our skies.

Raising awareness

The non-profit International Dark-Sky Association works with communities, individuals, businesses, governments and scientists to promote lighting that works for people without causing light pollution.

Changing our lights

Cities are beginning to pass **ordinances**, or laws, about using lighting that shines only where it’s needed.

Technology is making it easier to conserve energy and light with motion sensors, which turn on the lights when someone enters the area. These types of lights are even available for parking lots and streetlights.



This photo shows an example of glare. The bright spotlights on the top of this building shine right into the eyes of people outside. The lights might have been intended to make the building more safe, but they make it hard for customers to see as they walk toward the business.

Cities take the lead

In Toronto, Ontario, city lights are dimmed during bird migration seasons.

Many cities along Florida’s coast have laws against lighting that can be seen from the beach. Some areas also restrict bonfires and flashlights on the beach during sea turtle nesting season.



image © Bob Creelin/BobCreelin.com

These are examples of dark-sky-friendly light fixtures. They block the light from shining up and direct it exactly where it’s needed.

What can kids do?

Families can start by looking at outdoor light fixtures at home. Does the light go where it’s supposed to? Is it too bright? Can lights be turned off when they’re not needed?

Kids can present projects at school about light pollution. If you’re interested in space, you might form an astronomy club. Members could work together toward better lighting in your city. Write a letter to local leaders, such as the mayor, or to the editor of the newspaper.

“Sometimes people are more willing to listen to kids than adults,” said Kardel.

The Mini Page thanks W. Scott Kardel, managing director of the International Dark-Sky Association, for help with this issue.

Next week, The Mini Page is all about evergreens.

The Mini Page Staff

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