

GreatHearts

Northern Oaks



Supplemental Reading Packet

Week 5

April 20 - April 24, 2020

3rd grade

(3A) Ms. Gauss

(3B) Ms. Tyler

(3C) Ms. Kaiser

(3D) Mr. Aniol

Student Name: _____ Section: __

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Monday

SERENA

During the next ten weeks, Louis got rich. He went every evening except Sundays to the nightclub and played his trumpet for the customers. He did not like the job at all. The place was big and crowded and noisy. Everyone seemed to be talking too loudly, eating too much, and drinking too much. Most birds like to go to sleep at sundown. They do not want to stay up half the night entertaining people. But Louis was a musician, and musicians can't choose their working hours—they must work when their employer wants them to.

Every Saturday night Louis collected his pay—five hundred dollars. Mr. Lucas was always on hand to receive his agent's fee of ten percent from Louis. After Louis had paid Mr. Lucas, he still had four hundred



and fifty dollars left, and he would put this in his moneybag, hop into the waiting taxicab, and return to Bird Lake, arriving at around 3 A.M. His moneybag grew so stuffed with money, Louis was beginning to worry.

On Sunday afternoons, if the weather was good, crowds of people would gather on the shores of Bird Lake, and Louis would stand on the island in the middle of the lake and give a concert. This became a popular event in Philadelphia, where there isn't much going on on Sunday. Louis took the concert very seriously. By playing for the people, he was earning the right to remain free and not have a wing clipped.

He was always at his best on Sundays. Instead of playing jazz and rock and folk and country-and-western, he would play selections from the works of the great composers—Ludwig van Beethoven, Wolfgang Amadeus Mozart, and Johann Sebastian Bach—music he had learned by listening to records at Camp Kookooskoos. Louis also liked the music of George Gershwin and Stephen Foster. When he played “Summertime” from *Porgy and Bess*, the people of Philadelphia felt that it was the most thrilling music they had ever heard. Louis was considered so good on the trumpet he was invited to make a guest appearance with the Philadelphia Symphony Orchestra.



One day, about a week before Christmas, a great storm came up. The sky grew dark. The wind blew a howling gale. It made a whining noise. Windows rattled. Shutters came off their hinges. Old newspapers and candy wrappers were picked up by the wind and scattered like confetti. Many of the creatures in the Zoo became restless and uneasy. Over in the Elephant House, the elephants trumpeted in alarm. Lions roared and paced back and forth. The Great Black Cockatoo screamed. Keepers rushed here and there, shutting doors and windows and making everything secure against the awful force of the gale. The waters of Bird Lake were ruffled by the strong, mighty wind, and for a while the lake looked like a small ocean. Many of the water birds sought protection on the island.

Louis rode out the gale on the lake, in the lee of

the island. He faced the wind and kept paddling with his feet, his eyes bright with wonder at the strength of the blast. Suddenly he saw an object in the sky. It was coming down out of the clouds. At first, he couldn't make out what it was.

"Maybe it's a flying saucer," he thought.

Then he realized that it was a large white bird, struggling desperately to come in against the wind. Its wings were beating rapidly. In a moment it splashed down and flopped ashore, where it lay sprawled out, almost as if it were dead. Louis stared and stared and stared. Then he looked again.

"It looks like a swan," he thought.

It *was* a swan.

"It looks like a *Trumpeter* Swan," he thought.

It *was* a Trumpeter Swan.

"My goodness," said Louis to himself, "it looks like Serena. It *is* Serena. She's here at last. My prayers have been answered!"

Louis was right. Serena, the swan of his desiring, had been caught by the fierce storm and blown all the way across America. When she looked down and saw Bird Lake, she ended her flight, almost dead from exhaustion.

Louis was tempted to rush right over. But then he



thought, "No, that would be a mistake. She is in no condition at the moment to perceive the depth of my affection and the extent of my love. She is too pooped. I will wait. I will bide my time. I will give her a chance to recover. Then I will renew our acquaintance and make myself known."

Louis did not go to his job that night; the weather was too bad. All night, he stayed awake, keeping watch, at a slight distance from his beloved. When morning came, the wind subsided. The skies cleared.

The lake grew calm. The storm was over. Serena stirred and woke. She was still exhausted, and very mussy. Louis stayed away from her.

"I'll just wait," he thought. "When in love, one must take risks. But I'm not going to risk everything with a bird who is too tired to see straight. I won't hurry, and I won't worry. Back home on Upper Red Rock Lake, I was without a voice; she ignored me because I could not tell her of my love. Now, thanks to my brave father, I have my trumpet. Through the power of music, I will impress her with the intensity of my desire and the strength of my devotion. She will hear me say ko-hoh. I'll tell her I love her in a language anybody can understand, the language of music. She will hear the trumpet of the swan, and she will be mine. At least, I *hope* she will."

Usually, if a strange bird appeared on Bird Lake, one of the keepers would report its arrival to the Head Man in Charge of Birds, whose office was in the Bird House. The Head Man would then give the order to have the new bird pinioned—have one of its wings clipped. But today, the keeper who usually tended the waterfowl was sick with the flu and had not come to work. Nobody noticed that a new Trumpeter Swan had arrived. Serena was being very quiet, anyway—she was

not attracting any attention. There were now five Trumpeters on the lake. There were the original three captive swans, Curiosity, Felicity, and Apathy. There was, of course, Louis. And now there was the new arrival, Serena, still exhausted but beginning to revive.

Toward the end of the afternoon, Serena roused herself, looked at her surroundings, had a bite to eat, took a bath, then walked out of the water and stood for a long while preening her feathers. She felt distinctly better. And when her feathers were all smoothed out, she looked extremely beautiful—stately, serene, graceful, and very feminine.

Louis trembled when he saw how truly lovely she was. He was again tempted to swim over and say ko-hoh and see if she remembered him. But he had a better idea.

"There is no hurry," he thought. "She's not going to leave Philadelphia tonight. I will go to my job, and when I get back from work, I shall abide near her all through the night. Just at daylight, I'll awaken her with a song of love and desire. She will be drowsy; the sound of my trumpet will enter her sleepy brain and overcome her with emotion. My trumpet will be the first sound she hears. I will be irresistible. I will be the first thing she sees when she opens her eyes, and

she will love me from that moment on."

Louis was well satisfied with his plan and began to make preparations. He swam ashore, removed his things, hid them under a bush, then returned to the water, where he fed and bathed. Then he fixed his feathers carefully. He wanted to look his best next morning, when the meeting was to take place. He drifted around for a while, thinking of all the songs he liked and trying to decide which one to play to wake Serena in the morning. He finally decided to play "Beautiful Dreamer, Wake Unto Me." He had always loved that song. It was sad and sweet.

"She will be a beautiful dreamer," thought Louis, "and she will wake unto me. The song fits the situation perfectly."

He was determined to play the song better than he had ever played it before. It was one of his best numbers. He really knew how to play it awfully well. Once, when he played it at one of his Sunday concerts, a music critic from a Philadelphia newspaper heard him, and next morning the paper said: "Some of his notes are like jewels held up to the light. The emotion he transmits is clean and pure and sustained." Louis had memorized that statement. He was proud of it.

Now he was anxious for morning to come, but he

still had his job at the nightclub to go to. He knew the night would be long and that he wouldn't be able to sleep.

Louis swam ashore to pick up his things. When he looked under the bush, he received a terrible jolt: his medal was there, his slate and chalk pencil were



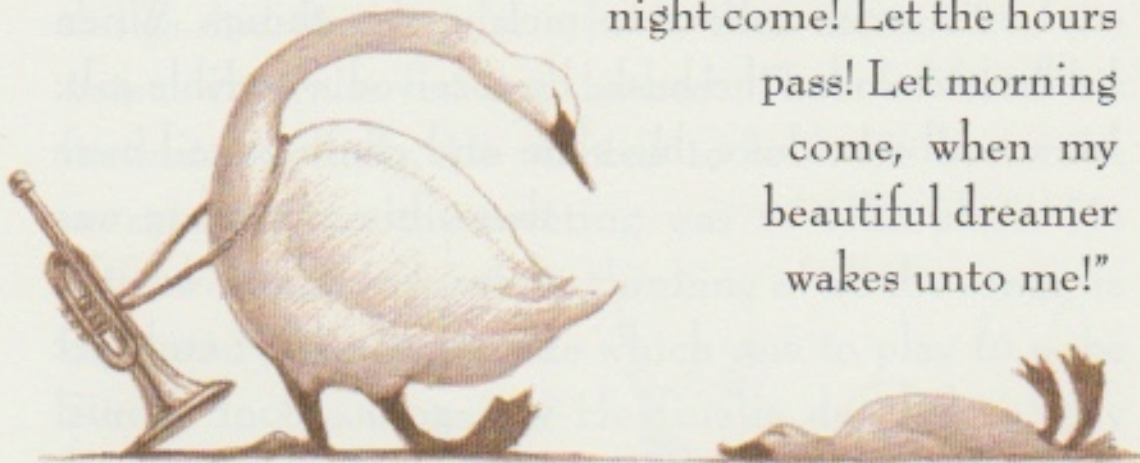
there, his moneybag was there, but where was the trumpet? His trumpet was gone. Poor Louis! His heart almost stopped. "Oh, no!" he said to himself. "Oh, no!" Without

his trumpet, his whole life would be ruined, all his plans for the future would collapse.

He was frantic with anger and fear and dismay. He dashed back into the water and looked up and down the lake. Far off, he saw a small Wood Duck that seemed to have something shiny in its mouth. It was the trumpet, all right! The duck was trying to play it. Louis was furious. He skimmed down the lake, going even faster than he had on the day he had saved Applegate from drowning. He swam straight for the duck, knocked him on the head with a swift blow from his wing, and grabbed the precious trumpet. The duck

fainted. Louis wiped the horn, blew the spit out of it, and hung it around his neck, where it belonged.

Now he was ready. "Let the night come! Let the hours pass! Let morning come, when my beautiful dreamer wakes unto me!"



Night came at last. Nine o'clock came. Louis went off to work, riding in the cab. The Zoo quieted down. The visitors had all gone home. Many of the animals slept or snoozed. A few of them—the great cats, the raccoon, the armadillo, the ones that enjoy the nighttime—prowled and became restless. Bird Lake was clothed in darkness. Most of the waterfowl tucked their heads under their wings and slept. At one end of the lake, the three captive swans—Curiosity, Felicity, and Apathy—were already asleep. Near the island, Serena, the beautiful Serena, was fast asleep and dreaming. Her long white neck was folded neatly back; her head rested on soft feathers.

Louis got home from work at two in the morning. He flew in over the low fence and splashed down near

Serena, making as little noise as possible. He did not try to sleep. The night was fair and crisp, as nights often are just before Christmas. Clouds drifted across the sky in endless procession, partially hiding the stars. Louis watched the clouds, watched Serena as she slept, and waited for day to come—hour after hour after hour.

At last, a faint light showed in the east. Soon, creatures would be stirring, morning would be here.

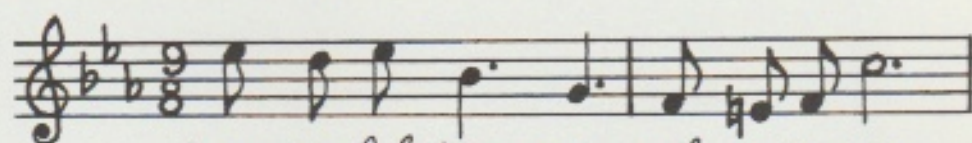
"This is my moment," thought Louis. "The time has come for me to waken my true love."

He placed himself directly in front of Serena. Then he raised the trumpet to his mouth. He tilted his head: the horn pointed slightly upward toward the sky, where the first light was showing.

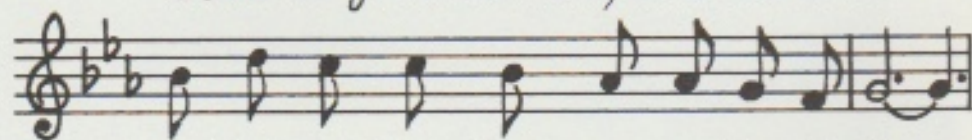
He began his song.

"Beautiful dreamer," he played, "wake unto me . . ."

The first three or four notes were played softly. Then as the song progressed, the sound increased; the light in the sky grew brighter.



Beau-ti-ful dream-er, wake un-to me



Star-light and dew-drops are wait-ing for thee.-

Each note was like a jewel held to the light. The sound of Louis's trumpet had never before been heard at this early dawn-hour in the Zoo, and the sound seemed to fill the whole world of buildings and animals and trees and shrubs and paths and dens and cages. Sleepy bears, dozing in their grotto, pricked up their ears. Foxes, hiding in their dens, listened to the



sweet and dreamy sound of the horn blown at the coming of light. In the Lion House, the great cats heard. In the Monkey House, the old baboon listened in wonder to the song.

Beau—ti—ful dream—er, wake un—to me . . .



The hippo heard, and the seal in his tank. The gray wolf heard, and the yak in his cage. The badger, the coon, the Ring-tailed Coati, the skunk, the weasel, the otter, the llama, the dromedary, the White-tailed Deer—all heard, listened, pricked up their ears at the song. The kudu heard, and the rabbit. The beaver heard, and the snake, who *has* no ears. The wallaby, the possum, the anteater, the armadillo, the peafowl, the pigeon, the bowerbird, the cockatoo, the flamingo—all heard, all were aware that something out of the ordinary was happening.

Philadelphians, waking from sleep in bedrooms where the windows were open, heard the trumpet. Not one person who heard the song realized that this was the moment of triumph for a young swan who had a speech defect and had conquered it.

Louis was not thinking about his large, unseen audience of animals and people. His mind was not on bears and buffaloes and cassowaries and lizards and hawks and owls and people in bedrooms. His mind was on Serena, the swan of his choice, the beautiful dreamer. He played for her and for her alone.

At the first note from his trumpet, she woke. She raised her head and her neck straightened until her head was held high. What she saw filled her with

astonishment. She gazed straight at Louis. At first, she could hardly remember where she was. Directly in front of her, she saw a handsome young male swan, a cob of noble proportions. Held against his mouth was a strange instrument—something she had never seen before. And from this strange instrument came sounds that made her tremble with joy and with love. As the song went on, as the light grew stronger, she fell hopelessly in love with this bold trumpeter who had awakened her from her dreams. The dreams of night were gone. New dreams of day were upon her. She knew that she was full of sensations she had never had before—feelings of delight and ecstasy and wonder.

She had never seen a finer-looking young cob. She had certainly never seen *any* swan with so many personal possessions around his neck. And she had never been so thrilled by a sound before in her whole life.

“Oh!” she thought. “Oh, oh, oh, oh!”

The song ended. Louis lowered his trumpet and bowed solemnly to Serena. Then he raised his horn again.

“Ko-hoh!” he said.

“Ko-hoh!” replied Serena.

“Ko-hoh, ko-hoh!” said Louis through his trumpet.

"Ko-hoh, ko-hoh!" replied Serena.

Each felt drawn to the other by a mysterious bond of affection.

Louis swam once rapidly around Serena.

Then Serena swam once rapidly around Louis. This seemed to amuse them.

Louis dipped his neck and pumped it back and forth.

Serena dipped her neck and pumped it back and forth.

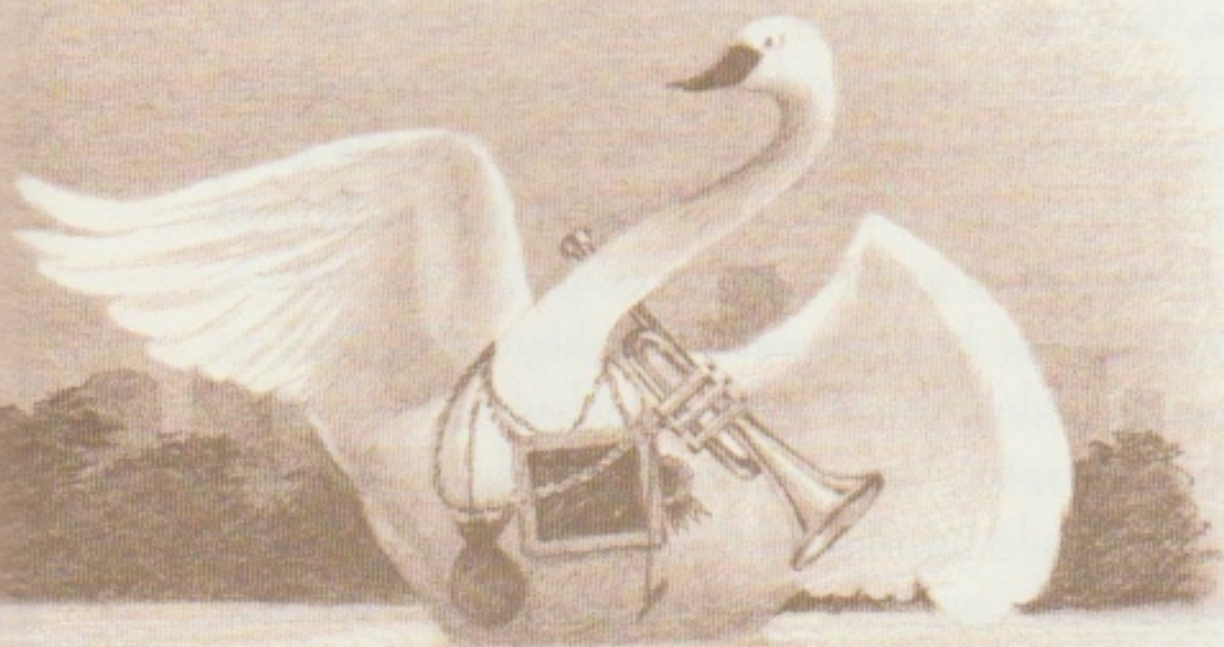
Louis splashed a little water into the air. Serena



splashed a little water into the air. It was like a game. It was love at long last for Louis; it was love at first sight for Serena.

Then Louis decided to show off. "I'll play her my own composition," he thought. "The one I made up for her last summer at camp." Again he raised his trumpet.

*Oh, ever in the greening spring
By bank and bough retiring,
For love shall I be sorrowing
And swans of my desiring.*



The notes were clear and pure. They filled the Zoo with beauty. If Serena had been in any doubt before, she no longer was. She succumbed completely to this charmer, this handsome musician, this rich and talented cob.

Louis knew that his plan had succeeded. His beautiful dreamer had waked, and she had waked unto him. Never again would they be parted. All the rest of their lives they would be together. Thoughts of small quiet lakes in the woods, where canebrakes grew and blackbirds sang, filled Louis's mind. Thoughts of springtime and nesting and little cygnets. Oh, ever in the greening spring!

Louis had been told once by his father what happened to deep-sea divers when they go far, far down into the ocean. At great depths, where the pressure is great and the watery world is strange and mysterious, divers sometimes experience what they call the "rapture of the deep." They feel so completely peaceful and enchanted, they never want to return to the surface. Louis's father had warned him about this. "Always remember, when you dive deep," he had said, "that this feeling of rapture can lead you to your death. No matter how wonderful you feel down there, *don't ever forget to return to the surface*, where you can breathe again!"

Looking at Serena, Louis thought to himself, "I think love is like the rapture of the deep. I feel so good I just want to stay right where I am. I'm experiencing rapture of the deep even though I'm right on top of the water. I have never felt so good, so peaceful, so excited, so happy, so ambitious, so desirous. If love is like this on a cold day in December in the Philadelphia Zoo, imagine what it's going to be like in spring on a remote lake in Canada!"

These were Louis's secret thoughts. He was the happiest bird alive. He was a real Trumpeter Swan at last. His defect of being without a voice had at last been overcome. He felt very grateful to his father.

Cautiously, he placed his head across Serena's long beautiful white neck. It seemed a very daring thing to do, but she seemed to like it. Then he backed away. Serena swam toward him. Cautiously, she placed *her* head across *his* neck. It rested there for a moment; then she swam away.

"What a daring thing!" she thought. "But he seems to like it. How pleasing to know that I have found an acceptable mate—a cob I can love and respect, a cob that appears to be not only musical but also quite wealthy. Look at all those *things!*" said Serena to herself. Her eyes feasted on the trumpet, the slate, the

chalk pencil, the moneybag, the lifesaving medal.

"What a gay cob!" she thought. "What a dressy fellow!"

They swam off together toward the other end of the lake, where they could be alone. Then Louis, who was short on sleep, dozed off, while Serena ate her breakfast and fixed herself up.

Tuesday

FREEDOM

The news of Serena's arrival on Bird Lake had finally reached the Head Man in Charge of Birds. He went out to look at her and was delighted. Then he gave an order to one of his keepers.

"See to it that she is pinioned this morning—right away, before she flies off and leaves us. That swan is a valuable bird. Make sure she doesn't get away!"

Louis was just waking from his nap when he saw two keepers approaching Serena, who was standing on the shore near the ornamental fence. One keeper carried a large net with a long handle. The other carried surgical instruments. They were sneaking up on

Serena from behind, very slowly and quietly.

Louis knew right away what they were up to. He grew hot with rage. If those men succeeded in catching Serena and cutting a wing tip, all his plans would go wrong—she could never fly away to a lonely lake with him; she would have to remain in Philadelphia the rest of her life, a horrible fate.

“This is my moment,” thought Louis. “Nobody is going to clip my Love’s wing while *I’m* around.”



He hustled over to the island and stripped for action. He chucked his trumpet and all his other stuff under a willow tree. Then he returned to the water and waited for the right time to attack.

The keeper holding the net was crawling quietly up on Serena from the rear. She did not notice him—she was just standing there, dreaming of Louis. Slowly, slowly the keeper raised his net. As he did so, Louis went into action. Lowering his long, powerful neck until it pointed straight out in front of him like a lance, he streaked across the water, straight at the keeper, his wings beating the air, his feet beating the water. In a flash, he reached the scene and drove his strong bill straight into the seat of the man's pants. It was a well-aimed jab. The keeper doubled up in pain



and dropped the net. The other keeper tried to grab Serena by her throat. Louis beat him over the head with his wings, striking terrific blows and knocking the poor fellow off his feet. Surgical instruments bounced into the air. The net fell into the water. One keeper groaned and held his hand on his behind, where he had been stabbed. The other keeper lay on the ground, almost knocked out.

Serena slipped quickly into the water and glided gracefully away. Louis followed. He motioned for her to stay on the lake. Then he raced back to the island, grabbed his trumpet, his slate, his chalk pencil, his medal, and his moneybag, flew over the balustrade, and walked boldly into the Bird House. He was still mad. He went straight to the office of the Head Man in Charge of Birds. He rapped on the door.

"Come in!" said a voice.

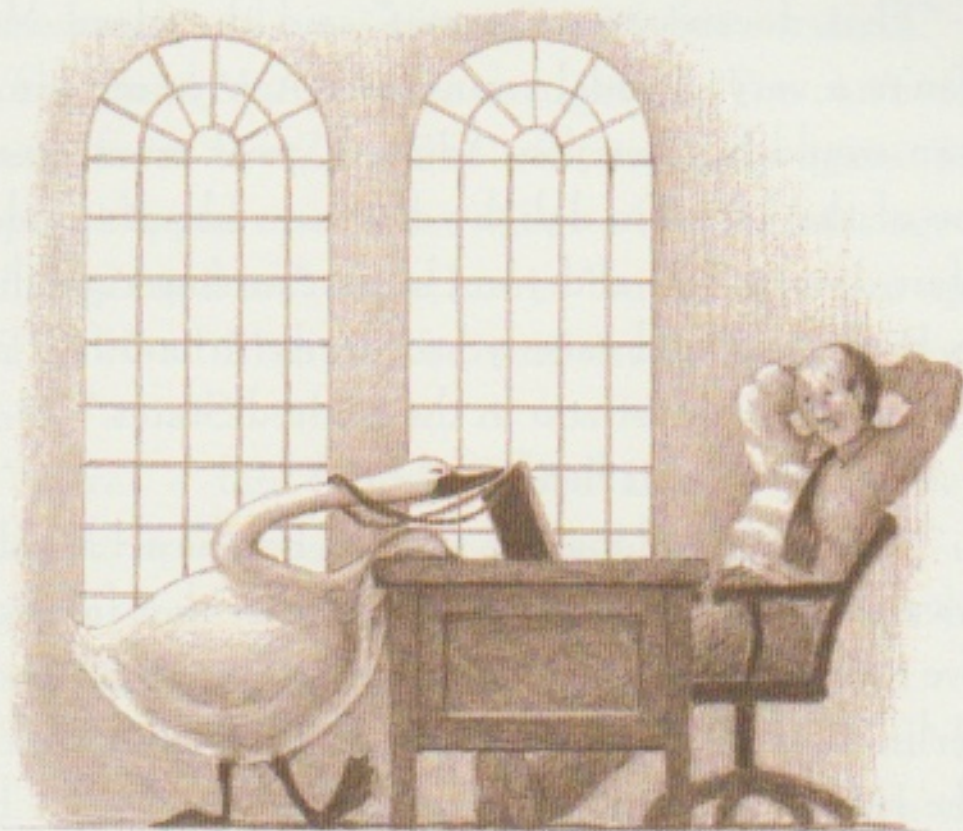
Louis entered. The Head Man was seated at his desk.

"Hello, Louis!" he said.

"Ko-hoh!" replied Louis through his trumpet.

"What's on your mind?" asked the man.

Louis placed his trumpet on the floor and took his slate and chalk pencil from his neck. "I'm in love," he wrote.



The Head Man leaned back in his chair and put his hands behind his head. His face had a faraway look. He gazed out of the window for a moment in silence.

“Well,” he said, “it’s natural that you’re in love. You’re young. You’re talented. In a couple of months, spring will be here. All birds fall in love in springtime. I suppose you’re in love with one of my young swans.”

“Serena,” wrote Louis. “She arrived the day before yesterday. I used to know her slightly, back in Montana. She loves me, too.”

"That doesn't surprise me," said the Head Man. "You're a very unusual young cob. Any young female swan would fall for you. You're a great trumpeter—one of the best. I'm delighted to hear about this love affair, Louis. You and your bride can stay right here on Bird Lake and raise your family in comfort and safety, in the oldest zoo in the United States."

Louis shook his head.

"I have other plans," he wrote. Then he set his slate down and raised his trumpet. "They say that falling in love is wonderful . . ." It was an old song by Irving Berlin. The room was filled with the sound of love. The Head Man had a dreamy look in his eyes.

Louis set his horn down and took up his slate again. "I am taking Serena away with me in a day or two," he wrote.

"Oh, no you're not!" said the Head Man firmly. "Serena now belongs to the Zoo. She is the property of the people of Philadelphia. She came here because of an act of God."

"It wasn't an act of God," wrote Louis. "It was a high wind."

"Well, anyway," said the Head Man, "she's *my* swan."

"No, she's mine," wrote Louis. "She's mine by reason

of the power of love—the greatest force on earth.”

The Head Man became thoughtful. “You can’t take Serena from the Zoo. She will never fly again. My keepers clipped one of her wings a few minutes ago.”

“They tried to,” wrote Louis, “but I beat them up.”

The Head Man looked surprised. “Was it a good fight?”

“It was a fair fight,” replied Louis. “They were sneaking up on her from behind, so I sneaked up on *them* from behind. They hardly knew what hit them.”

The Head Man chuckled. “I wish I’d seen it,” he said. “But look here, Louis, you’ve got to realize the position I’m in. I have a duty to the people of Philadelphia. Within the last couple of months, I’ve acquired *two* rare birds by accident—you and Serena. Two Trumpeter Swans! One arrived here blown by a gale, the other to keep a nightclub engagement. The whole business is most unusual for a zoo. I have my responsibility to the public. It is my duty as Head Man in Charge of Birds to see that Serena stays. You yourself, of course, are free to leave when you want to, because Mr. Lucas insisted that you remain free when we arranged for your Sunday concerts. But in Serena’s case . . . well, Louis, she’s got to have her left wing

tip amputated. The Zoo can't afford to lose a young, beautiful, valuable Trumpeter Swan just because *you* happen to be in love. Besides, I think you're making a great mistake. If you and Serena stay here, you'll be safe. You'll have no enemies. You'll have no worries about your children. No fox, no otter, no coyote will ever attack you with intent to kill. You'll never go hungry. You'll never get shot. You'll never die of lead poisoning from eating the shotgun pellets that are on the bottom of all natural lakes and ponds. Your cygnets will be hatched each spring and will live a long life in perfect ease and comfort. What more can a young cob ask?"

"Freedom," replied Louis on his slate. "Safety is all well and good: I prefer freedom." With that, he picked up his trumpet and played "Button up your overcoat, when the wind blows free . . ."

The Head Man smiled. He knew just what Louis meant. For a while the two remained silent. Louis put his trumpet aside. Then he wrote: "I ask two favors. First, put off the operation on Serena until after Christmas—I'll guarantee she won't try to escape. Second, let me send a telegram."

"O.K., Louis," replied the Head Man. And he handed Louis a sheet of paper and a pencil. Louis

wrote out a telegram to Sam Beaver. It said:

AM IN THE PHILADELPHIA ZOO. THIS IS AN
EMERGENCY. COME AT ONCE. I WILL PAY YOUR
PLANE FARE. AM NOW WEALTHY.

(Signed) LOUIS

He handed the telegram to the Head Man along with four dollars from his money bag. The Head Man was astounded. In all his days at the Zoo, this was the first time one of his birds had asked him to send a telegram. And of course he didn't know who Sam Beaver was. But he sent the wire and ordered his keepers to let Serena alone for a few days—which they were glad to do.

Louis thanked him and left. He returned to Serena, and they spent the day happily together, bathing, swimming, eating, drinking, and showing each other in a thousand small ways how much they loved each other.

Sam arrived at the Zoo on the day after Christmas. He was equipped as though he were going into the woods. Under one arm was a sleeping bag, neatly rolled. On his back was a rucksack containing his

toothbrush, his comb, a clean shirt, a hand ax, a pocket compass, his notebook, a pencil, and some food. In his belt was a hunting knife. Sam was fourteen now and big for his age. He had never seen a large zoo. He and Louis were overjoyed to see each other again.

Louis introduced Sam to Serena. Then he opened his moneybag and showed Sam his earnings: hundred-dollar bills, fifty-dollar bills, twenty-dollar bills, tens,



fives, ones, and some silver coins—a great pile.

“Goodness!” thought Sam. “I hope she’s not marrying him for his money.”

Louis took his slate and told Sam about the fight with the keepers and about how the Head Man wanted to keep Serena captive by clipping the tip of one wing. He told Sam it would ruin his life if Serena were to lose the power to fly. He explained that as soon as his father’s debts were paid and the trumpet honestly belonged to him, he and Serena intended to leave civilization and return to a wild life. “The sky,” he wrote on his slate, “is my living room. The woods are my parlor. The lonely lake is my bath. I can’t remain behind a fence all my life. Neither can Serena—she’s not built that way. Somehow or other we must persuade the Head Man to let Serena go.”

Sam stretched out on the shore of Bird Lake and clasped his hands behind his head. He looked up at the great wide sky. It was a clear blue, with small white clouds floating slowly across. Sam knew how Louis felt about freedom. For a long time he lay there, thinking. Ducks and geese swam slowly by, back and forth, an endless procession of captive birds. They seemed happy and well. Curiosity, Felicity, and Apathy—the three Trumpeters—swam by and peered

at the strange boy lying on the ground. Finally Sam sat up.

"Listen, Louis," he said. "How's this for an idea? You and Serena intend to raise a family every year, don't you?"

"Certainly," replied Louis on his slate.

"O.K.," said Sam. "In every family of cygnets, there is always one that needs special care and protection. Bird Lake would be a perfect place for this one little swan that needs extra security. This is a beautiful lake, Louis. This is a great zoo. If I can persuade the Head Man to let Serena remain free, would you be willing to donate one of your cygnets, now and then, if the Zoo needs another swan for the lake? If you agree, I'll go right in and see the Head Man about the matter."

It was now Louis's turn to think and think. After five minutes, he picked up his slate.

"Very well," he wrote. "It's a deal."

Then he picked up his trumpet. "Oh, ever in the greening spring," he played. "By bank and bough retiring . . ."

The waterfowl stopped swimming and listened. The keepers stopped what they were doing and listened. Sam listened. The Head Man in his office in the Bird House laid down his pencil, leaned back in his chair,

and listened. The sound of Louis's horn was in the air, and the whole world seemed better and brighter and wilder and freer and happier and dreamier.



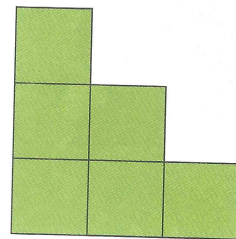
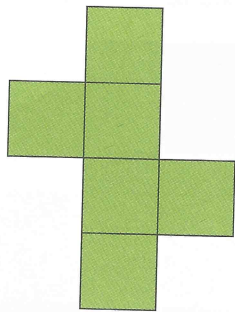
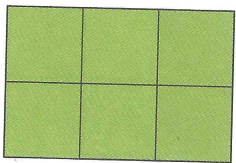
"That's a good tune," said Sam. "What is it?"

"Oh, just something I made up myself," wrote Louis on his slate.


13 AREA, PERIMETER AND VOLUME

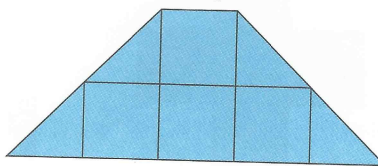
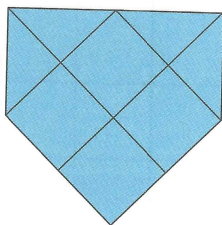
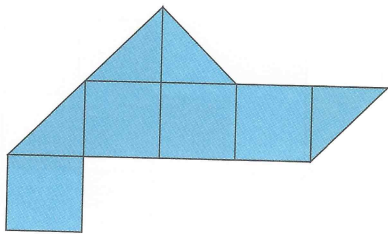
1 Area

These shapes are made up of the same number of square tiles.





Each tile is 1 square unit.

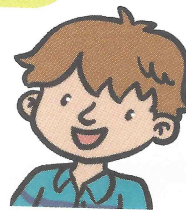
The shapes are of the same size.
They have the same **area**.
The area of each shape is  square units.



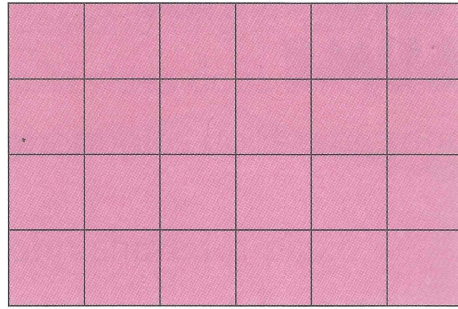
Each  is 1 square unit.

Each  is $\frac{1}{2}$ square unit.

These figures have the same area.
The area of each figure is  square units.

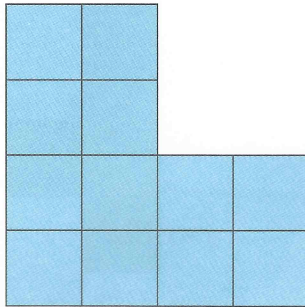


1. (a)



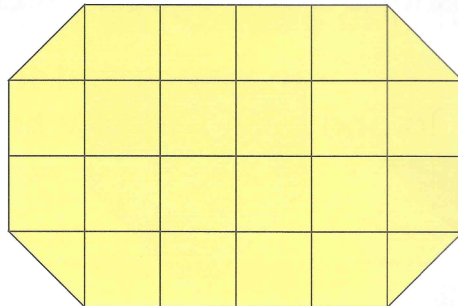
The area of the shape is square units.

(b)



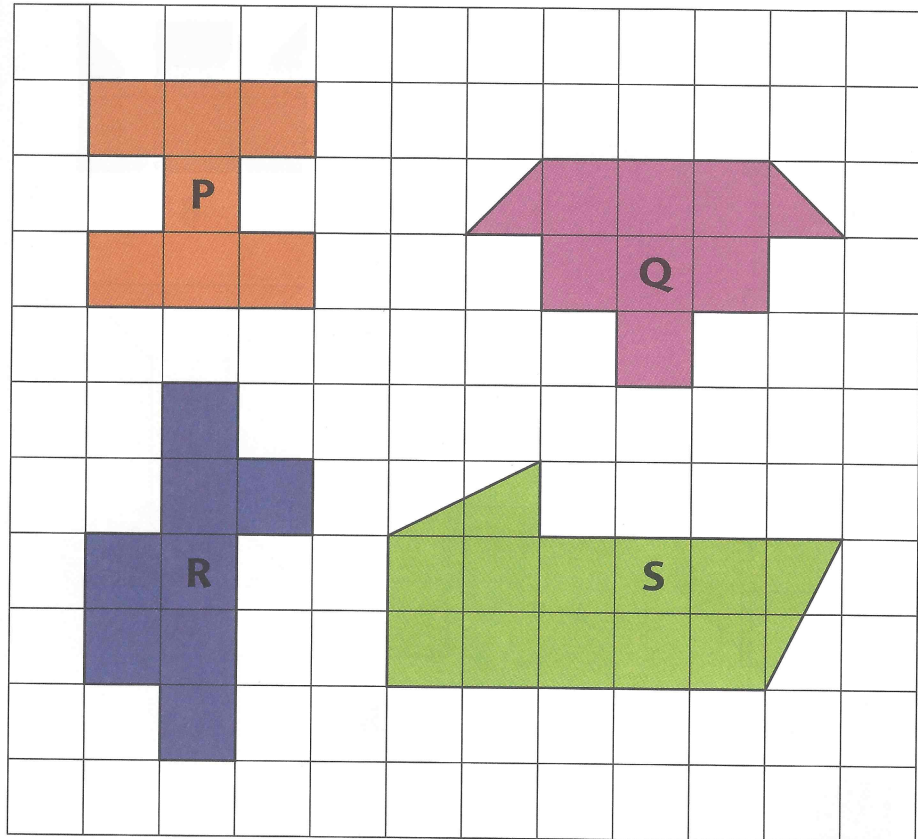
The area of the shape is square units.


(c)

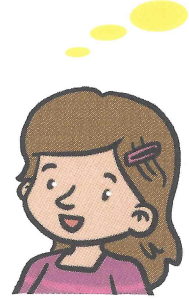


The area of the shape is square units.

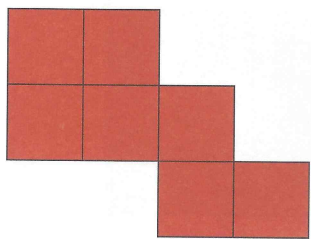
2. What is the area of each of the following figures?



Each  stands for 1 square unit.



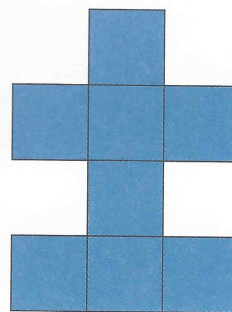
3. Use square cards to make these shapes.



A



B



C

The area of Shape A is  square units.

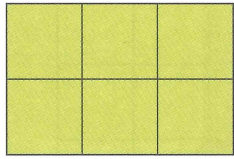
The area of Shape B is  square units.

The area of Shape C is  square units.

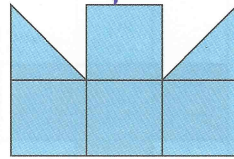
Which shape is the biggest?

Which shape is the smallest?

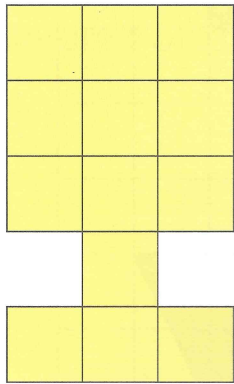
4. What is the area of each of the following figures?



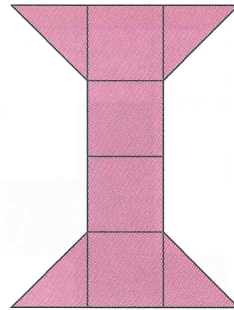
A



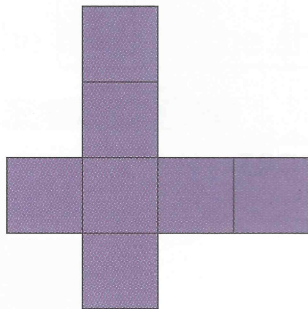
B



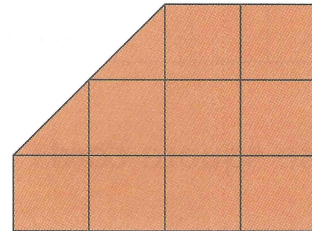
C



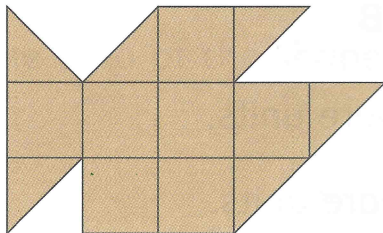
D



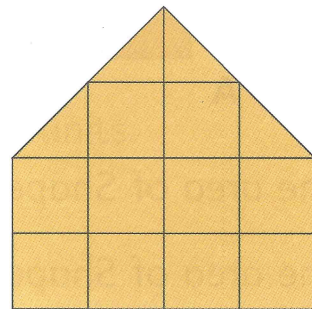
E



F



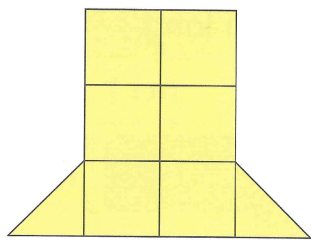
G



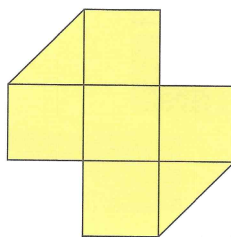
H

Which figure has the smallest area?
Which figure has the greatest area?

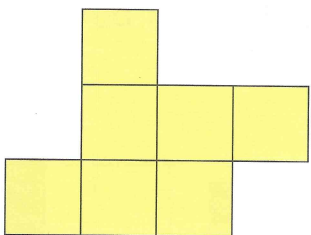
5. Which two shapes are of the same size?



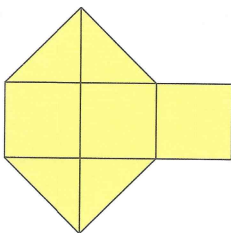
P



Q



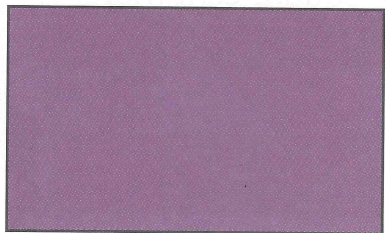
R



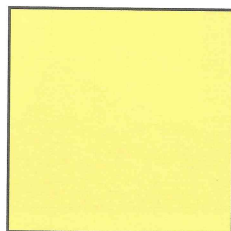
S

6. How many of these  will cover the inside of each of the following figures?

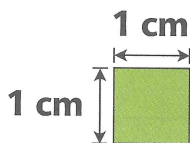
(a)



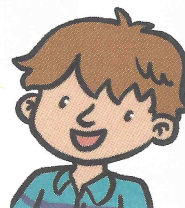
(b)



7. This is a 1-cm square.

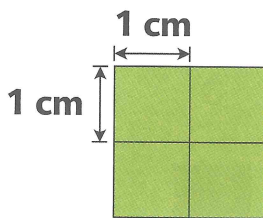


Each side of the square is 1 cm long.

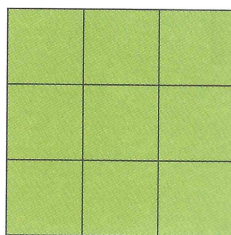


Its area is 1 **square centimeter**.

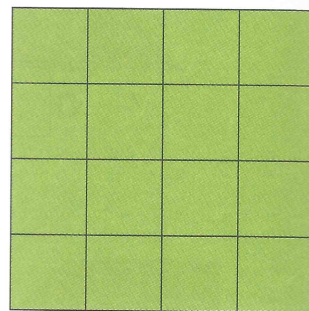
Give the area of each of the following squares in square centimeters.



a 2-cm square



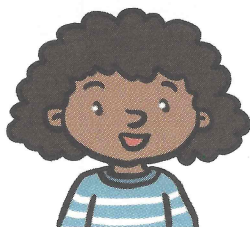
a 3-cm square



a 4-cm square

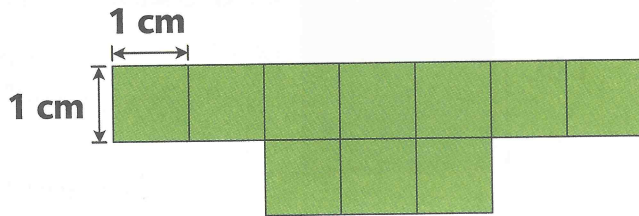
The square centimeter is a unit of area.

A 2-cm square is made up of 4 pieces of 1-cm squares.
Its area is 4 square centimeters.

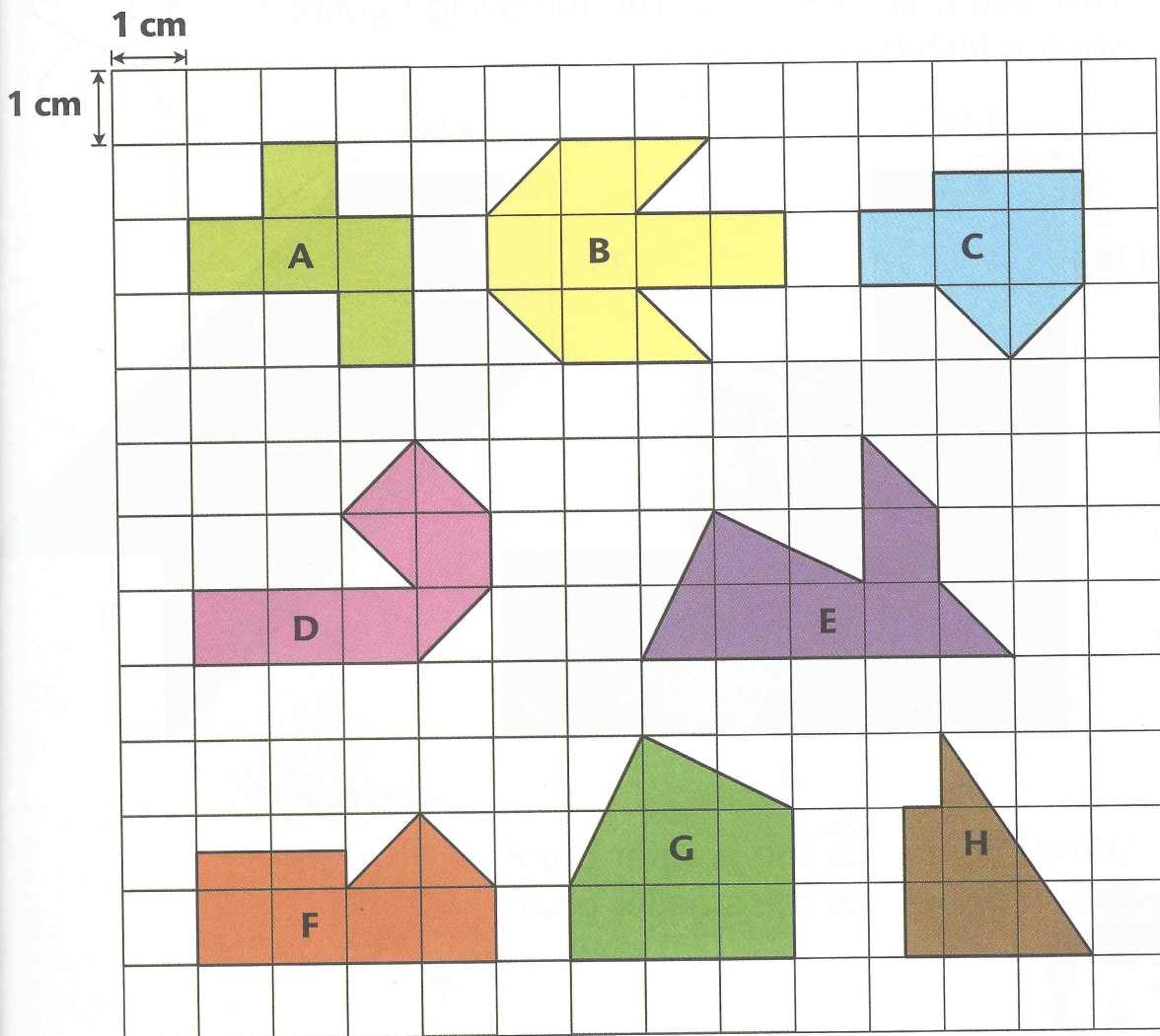


8. (a) What is the area of a 5-cm square?
(b) What is the area of a 10-cm square?

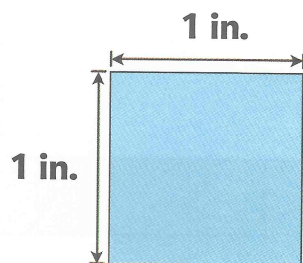
9. This figure is made up of 1-cm squares.
Find its area.



10. What is the area of each of the following figures?



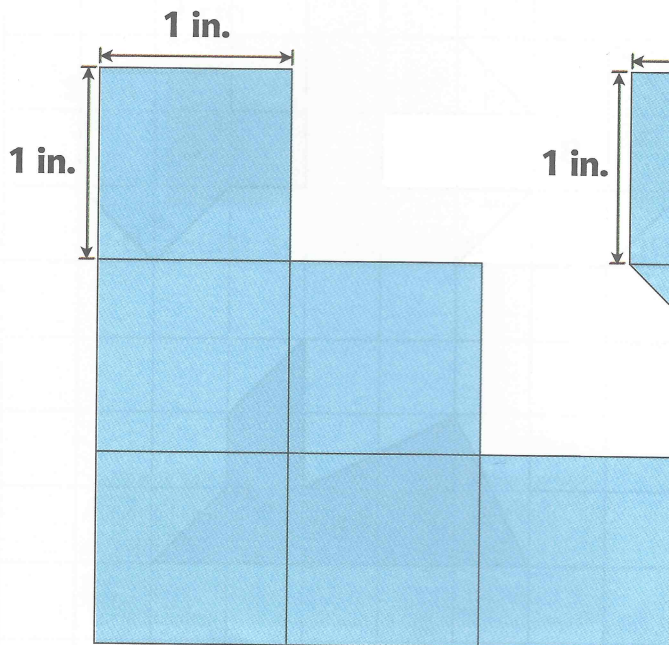
11. Each side of this square is 1 inch long.



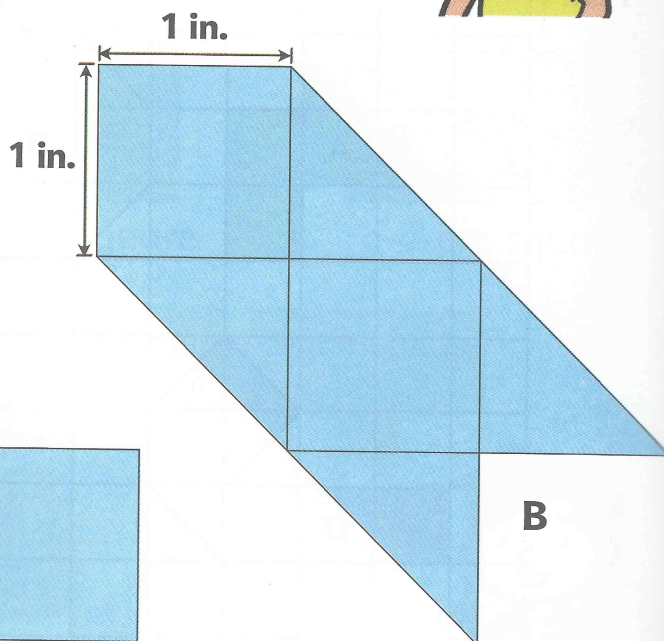
The square inch is also a unit of area.

Its area is 1 **square inch**.

Give the area of each of the following figures in square inches.



A



B

Which figure has the greater area?
Which figure has the smaller area?



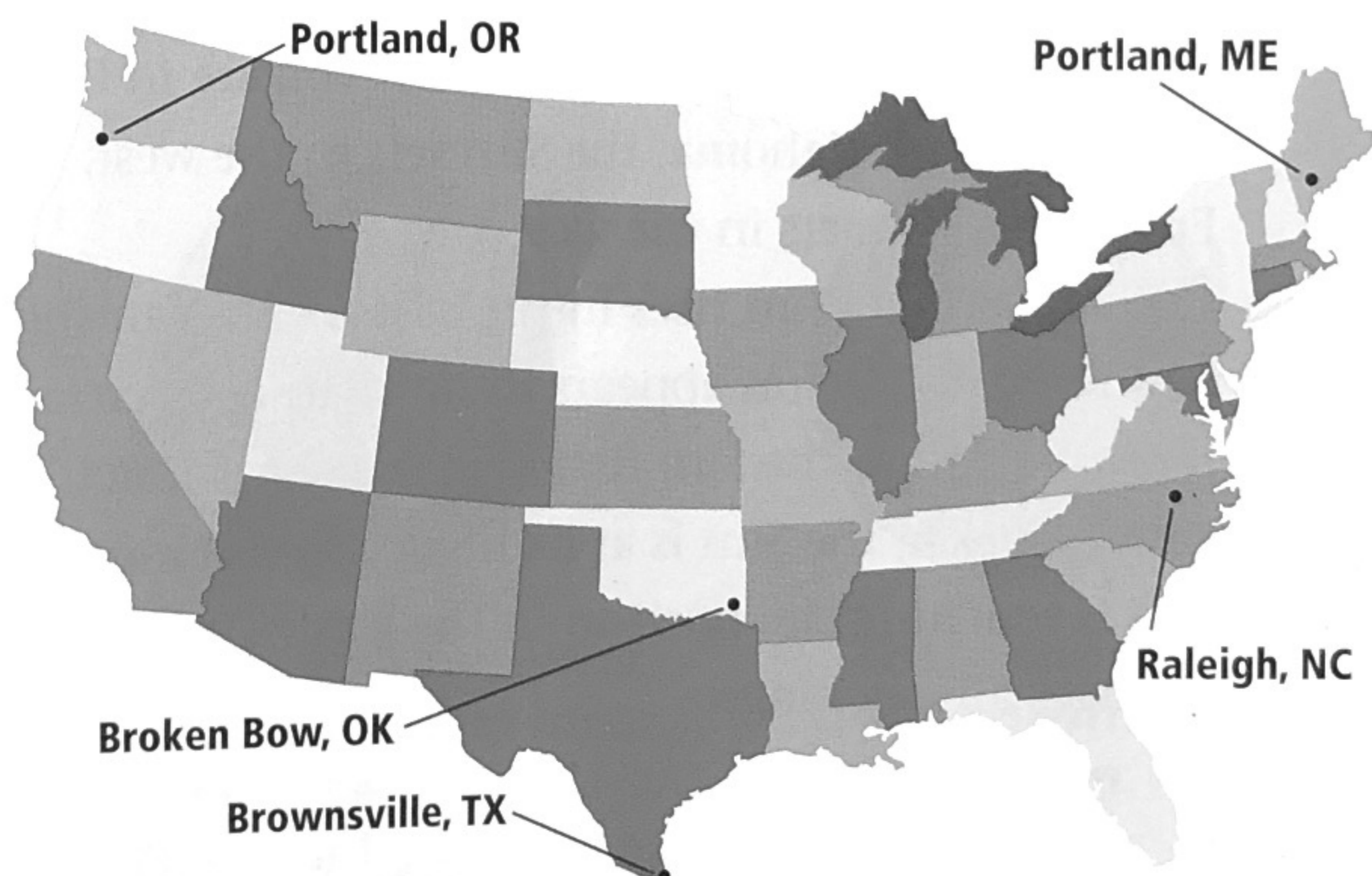
The Sun rising over a cornfield in Minnesota

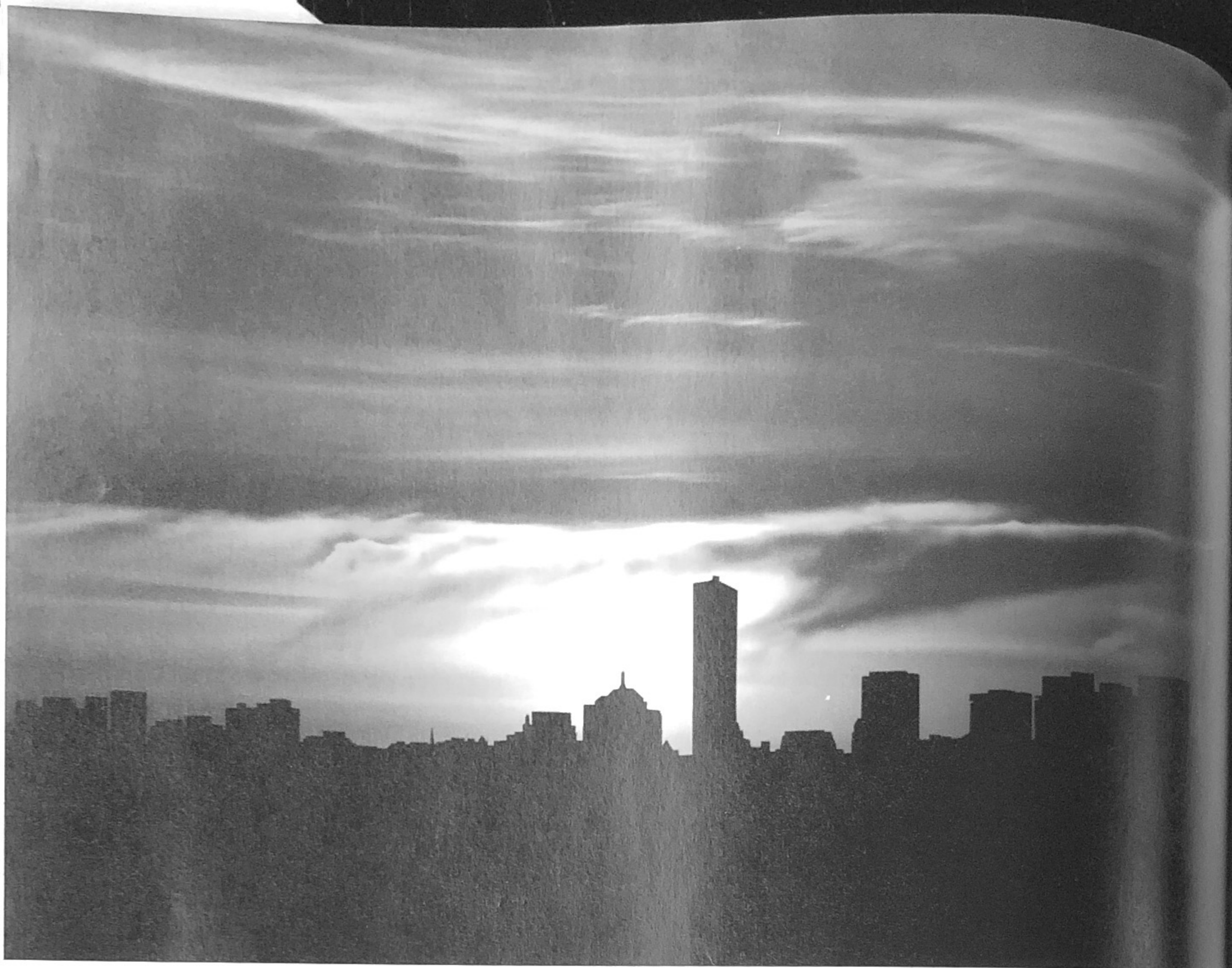
Sunrise and Sunset

The Sun has just come up in this picture. It is sunrise. What direction are you looking?

The Sun always rises in the east. If you are in Portland, Maine, the Sun rises in the east. If you are in Portland, Oregon, the Sun rises in the east. If you are in Raleigh, North Carolina, the Sun rises in the east.

If you are in Brownsville, Texas, or Broken Bow, Oklahoma, the Sun rises in the east. Wherever you are on Earth, the Sun rises in the east.





The Sun setting over the city of Boston, Massachusetts

In this picture, the Sun is just about to go down. It is sunset. What direction are you looking now?

That's right, you're looking west. The Sun always sets in the west. If you are in Portland, Maine, the Sun sets in the west. If you are in Portland, Oregon, the Sun sets in the west. If you are in Raleigh, North Carolina, the Sun sets in the west. If you are in Brownsville, Texas, or Broken Bow, Oklahoma, the Sun sets in the west. Wherever you are on Earth, the Sun sets in the west.

Every day the Sun rises in the east and sets in the west. To get from east to west, the Sun appears to slowly travel across the sky. In the early morning, when the Sun first comes up, it is touching the horizon in the east. At noon, the Sun is at its highest **position** in the sky. At sunset, the Sun is touching the horizon in the west. The Sun's position in the sky changes all day long.

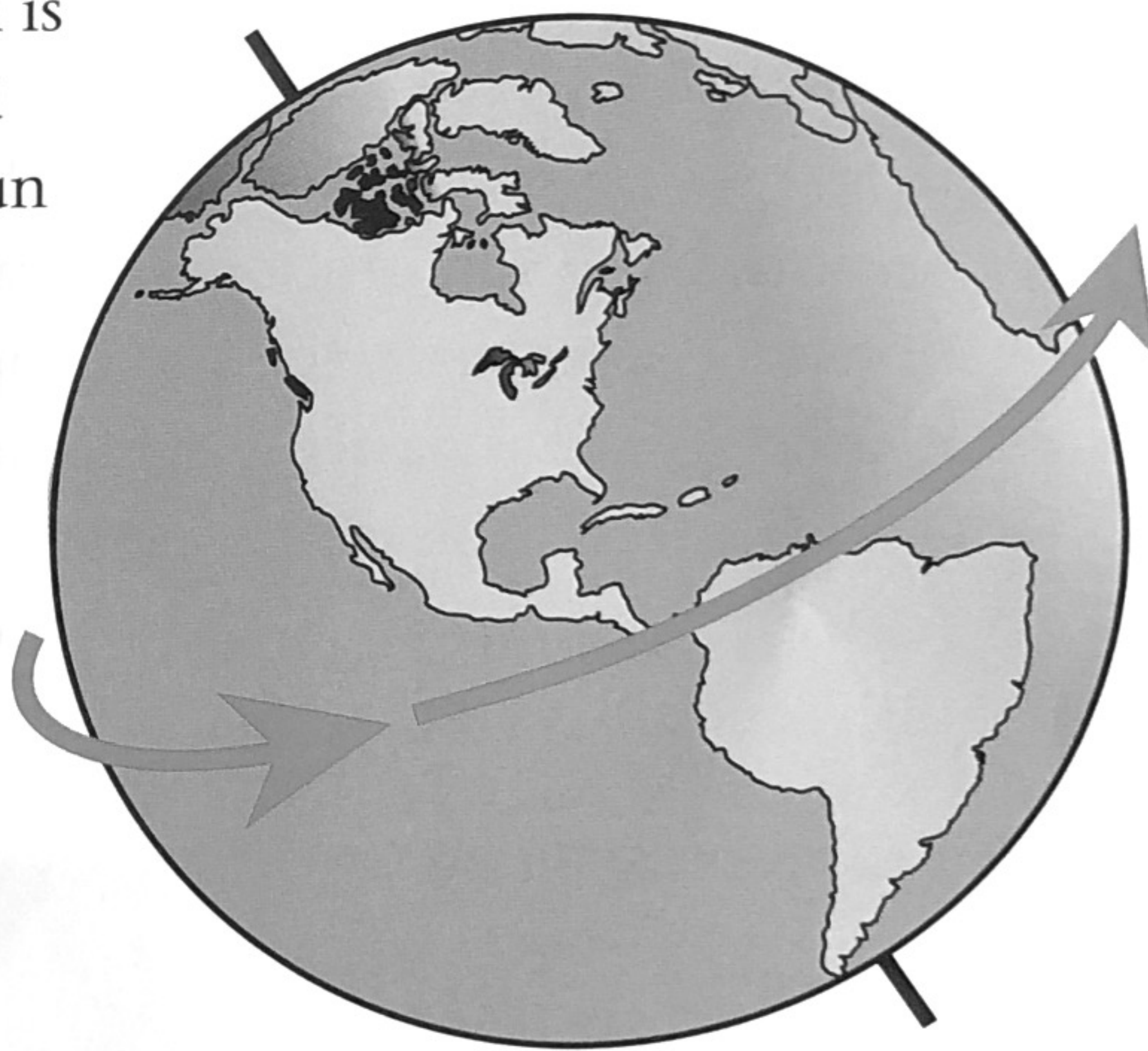
Earth's Rotation

The Sun looks as though it moves across the sky. But it really doesn't. It is Earth that is moving. Here's how it works.

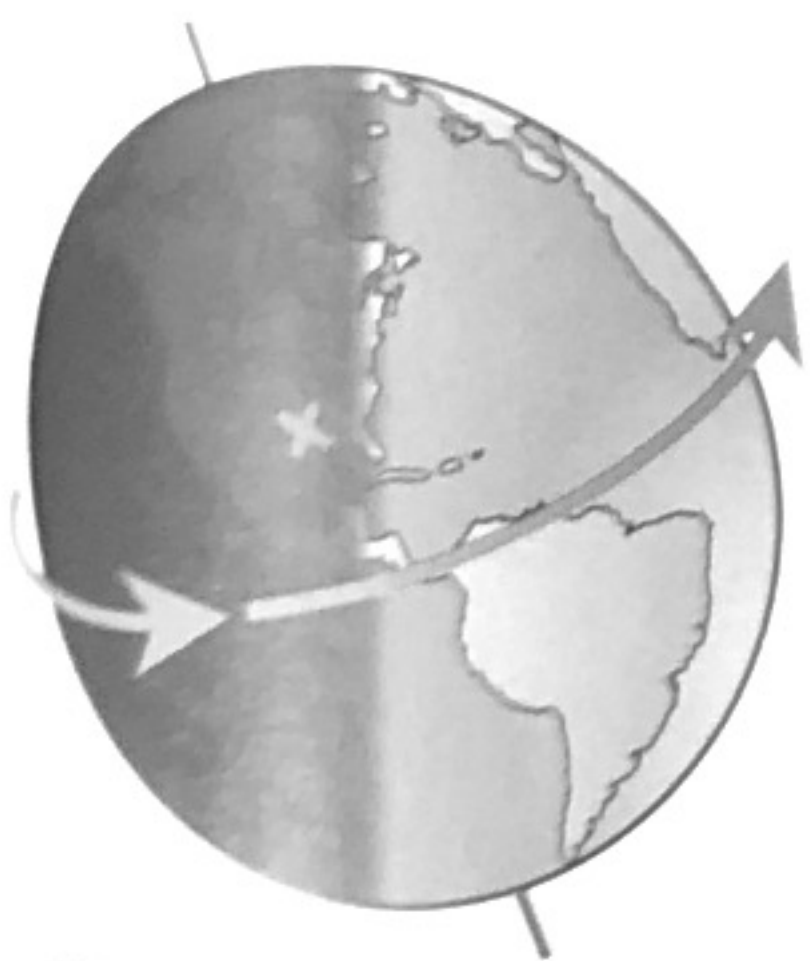
Earth is spinning like a top. It takes 1 day (24 hours) for Earth to **rotate** once. Because Earth is rotating, half of the time we are on the sunny side of Earth. We call the sunny side **day**. The other half of the time we are on the dark side of Earth. We call the dark side **night**.

Imagine it's just before sunrise. You can't see the Sun because you are still on the dark side of Earth. But in 5 minutes, Earth will rotate just enough for you to see the Sun come over the horizon. That moment is sunrise.

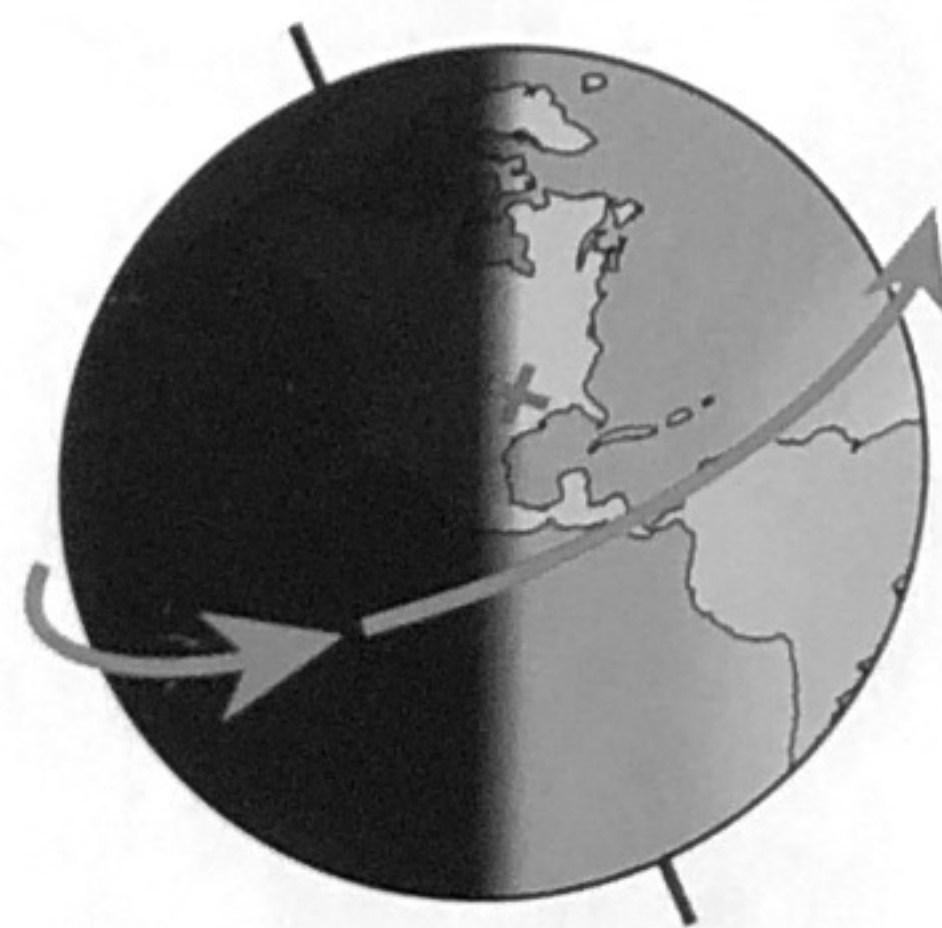
Earth turns toward the east, the direction of the orange arrow. That means the first sunlight of the day will be in the east. And, of course, Earth keeps turning. You keep moving with it. In 4 or 5 hours, you have turned so far that the Sun is high over your head. And 5 hours after that, the Sun is low in the western sky. This is because Earth is moving in an eastward direction. It looks as though the Sun is moving across the sky in a westward direction. Finally, it is sunset. The Sun slips below the horizon in the west. It is dark again.



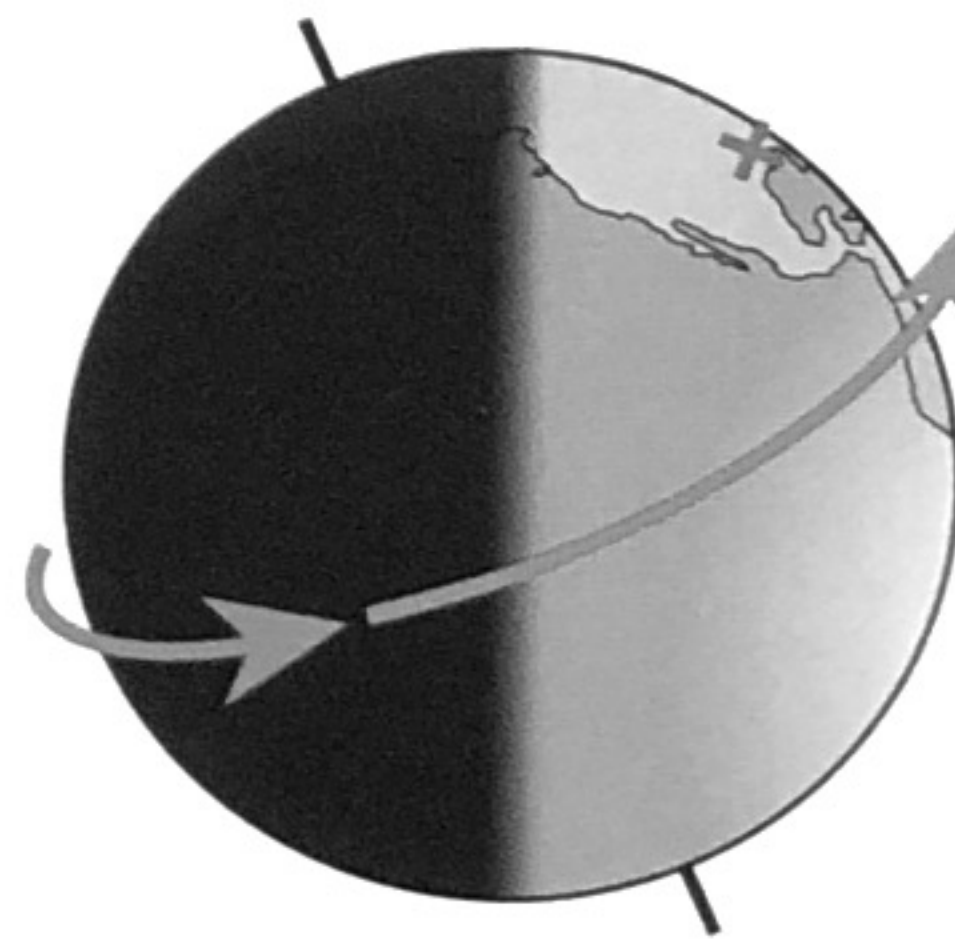
**Earth turns toward the east.
So the Sun seems to move from
east to west across the sky.**



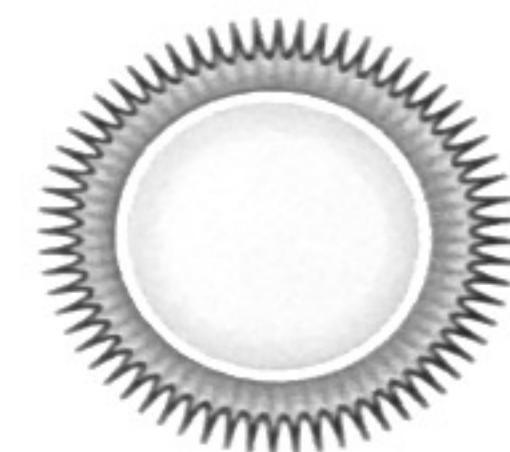
The **x** shows your position just before sunrise.



The **x** shows your position just after sunrise.



The **x** shows your position near noon.





There is one thing you can depend on for sure. The Sun will come up tomorrow morning. And you can be sure it will come up in the east. At the end of the day, it will set in the west. You can count on it.

As the day goes along, it looks as though the Sun travels across the sky from east to west. During the morning, it rises higher and higher in the sky. At noon, it is at its highest position in the sky. From noon to sunset, the Sun continues to travel west. And it gets lower and lower in the sky. At sunset, the Sun disappears below the horizon in the west. Another day has passed. And tomorrow will be the same.

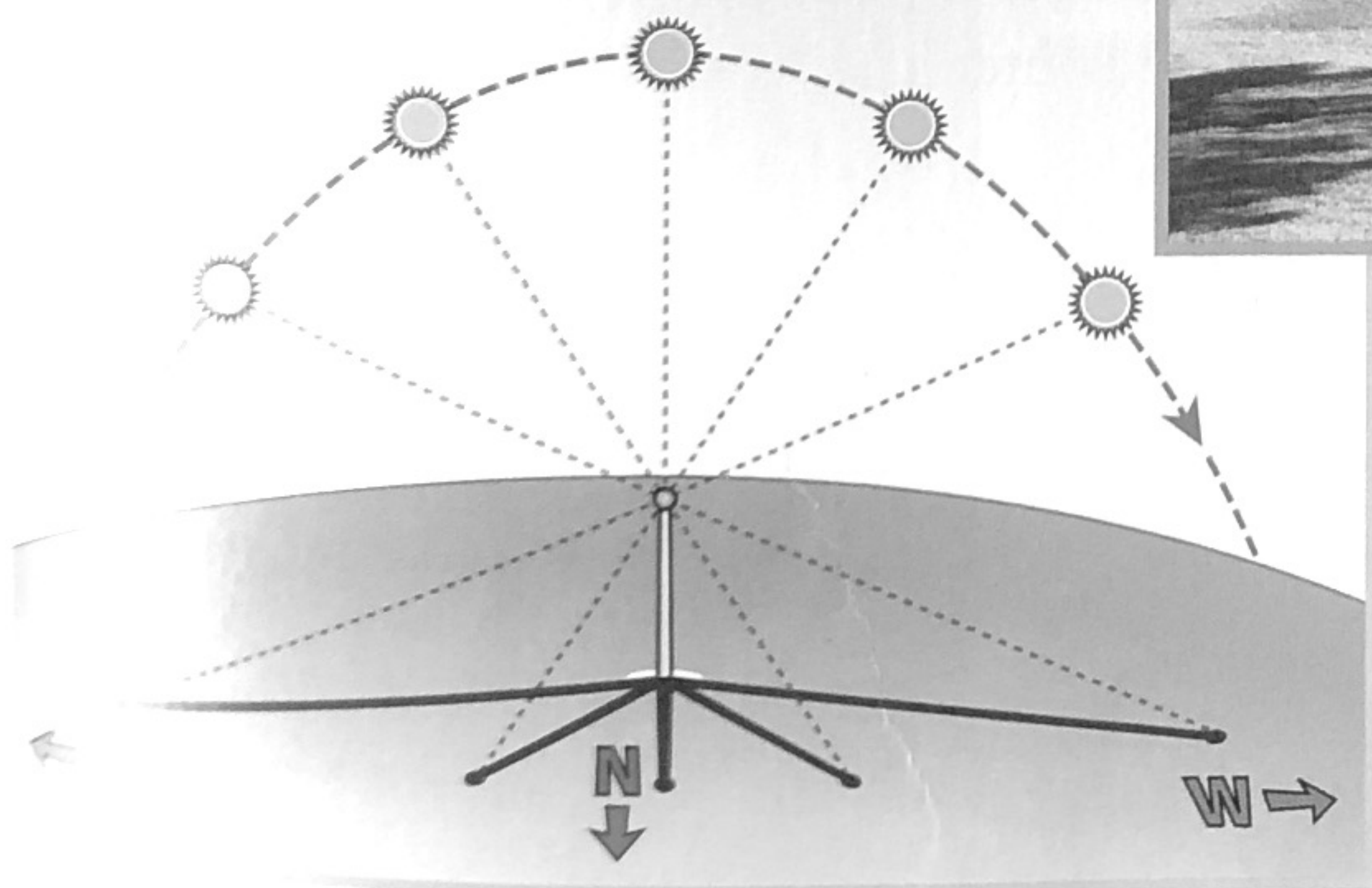
Well, almost the same. A careful observer will notice that the Sun's path through the sky is a tiny bit different every day. You can see the difference by studying shadows.



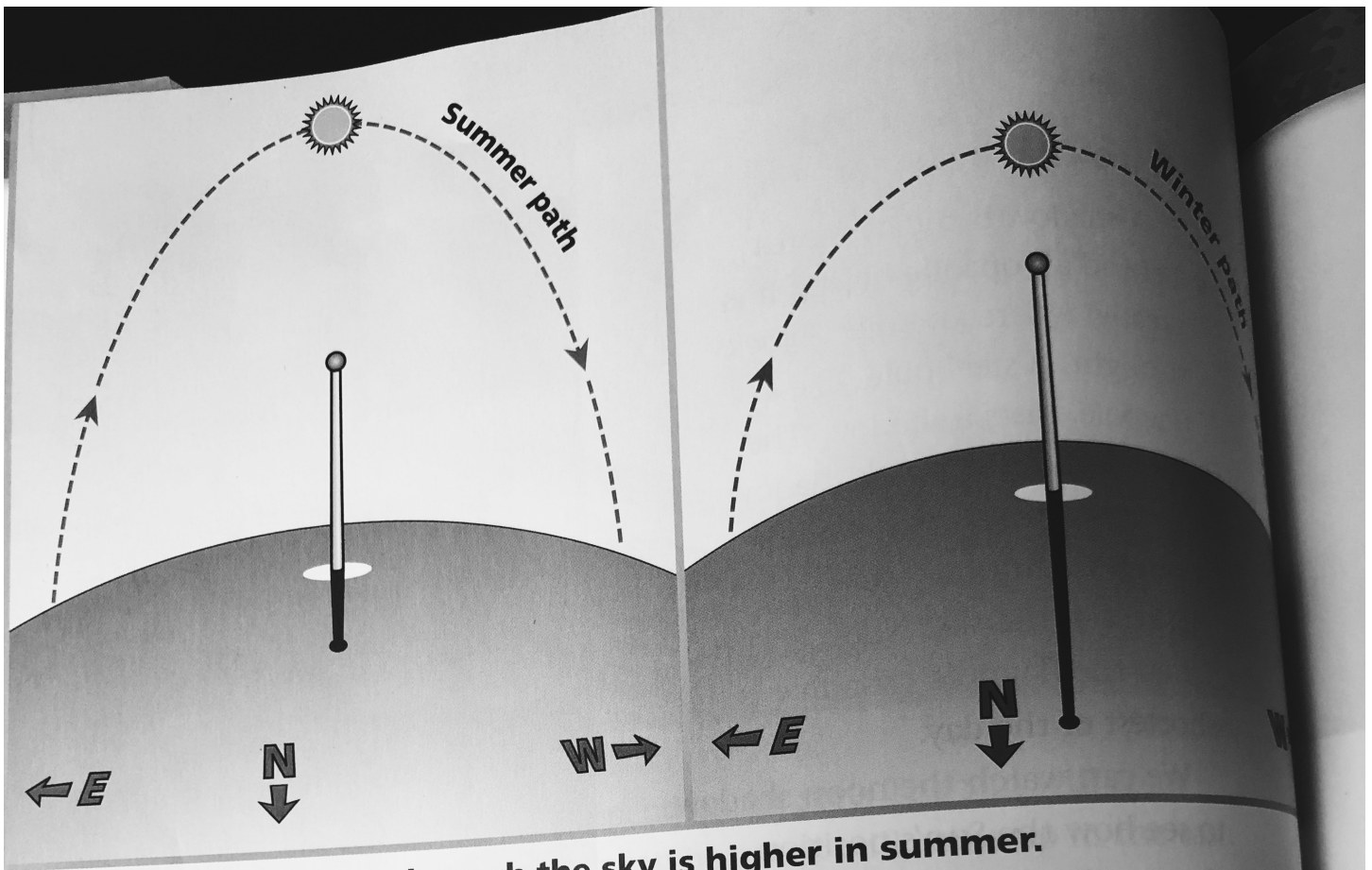
Shadows

A shadow is the dark area behind an opaque object. It is created where an object blocks sunlight. A steel pole, like a flagpole, casts a shadow. The direction of the pole's shadow changes as the Sun's position changes. At noon, the Sun is highest in the sky. Noon is also when the flagpole's shadow is the shortest of the day.

We can watch the noon shadow to see how the Sun's position changes from season to season. The length of that shadow changes a little bit every day. Why does the length of the shadow change? It changes because the position of the Sun at noon changes a little bit every day.



The Sun's position changes all day from sunrise to sunset.



The Sun's path through the sky is higher in summer.

The pattern of change is predictable. In North America, the position of the noon Sun gets higher in the sky from December 21 to June 21. On June 21, the Sun is highest in the sky. That's also the day when the flagpole's shadow is the shortest of the year.

The position of the noon Sun gets lower in the sky each day between June 21 and December 21. On December 21, the noon Sun is lowest in the sky. That's also the day that the flagpole's shadow is the longest of the year.

The Sun's position in the sky changes in two ways. Every day the Sun rises in the east, appears to travel across the sky, and sets in the west. The other way the Sun's position changes is in its daily path. In summer, the Sun's path is high in the sky. In winter, the Sun's path is lower in the sky.

Review Questions

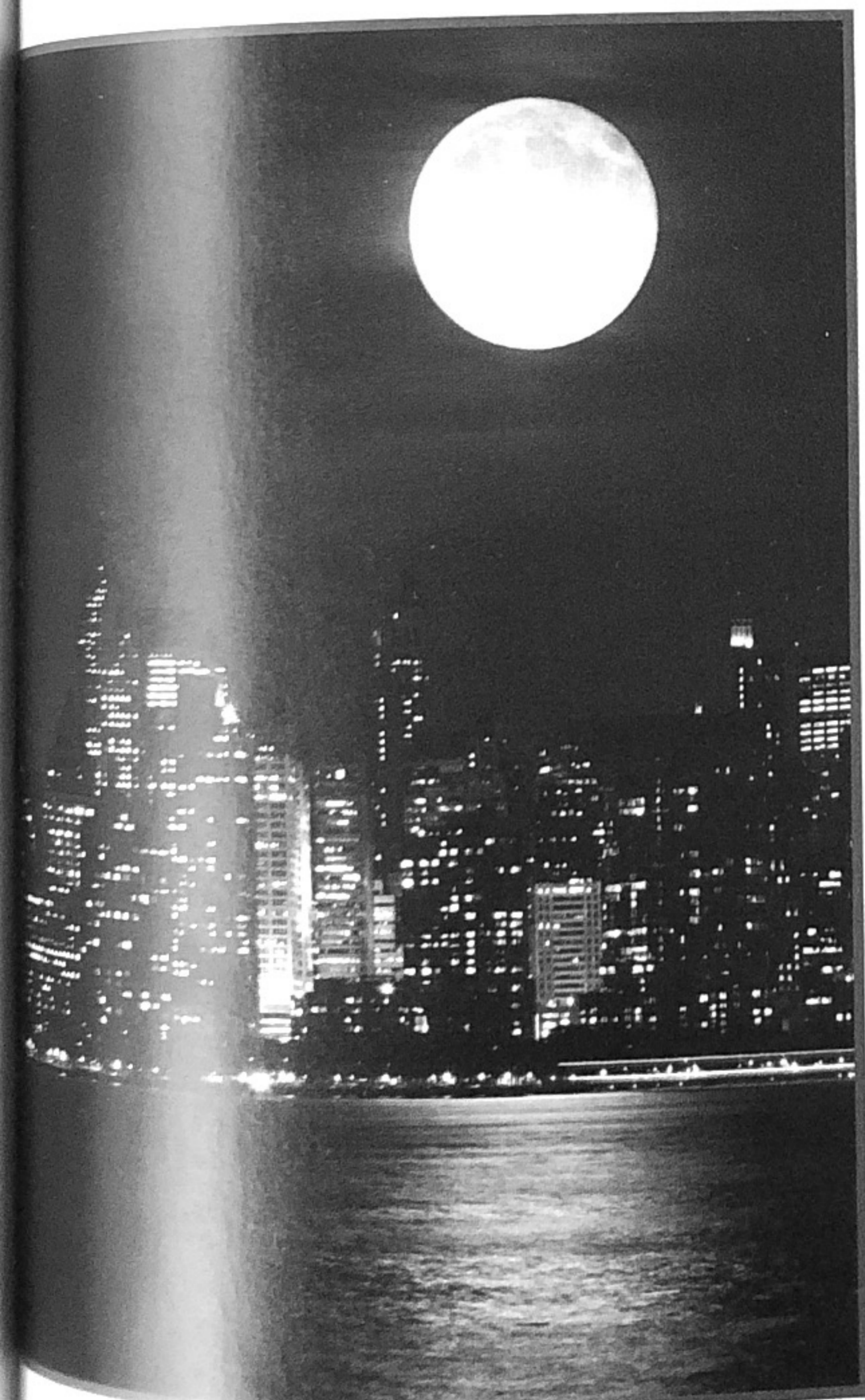
Wednesday

The Night Sky

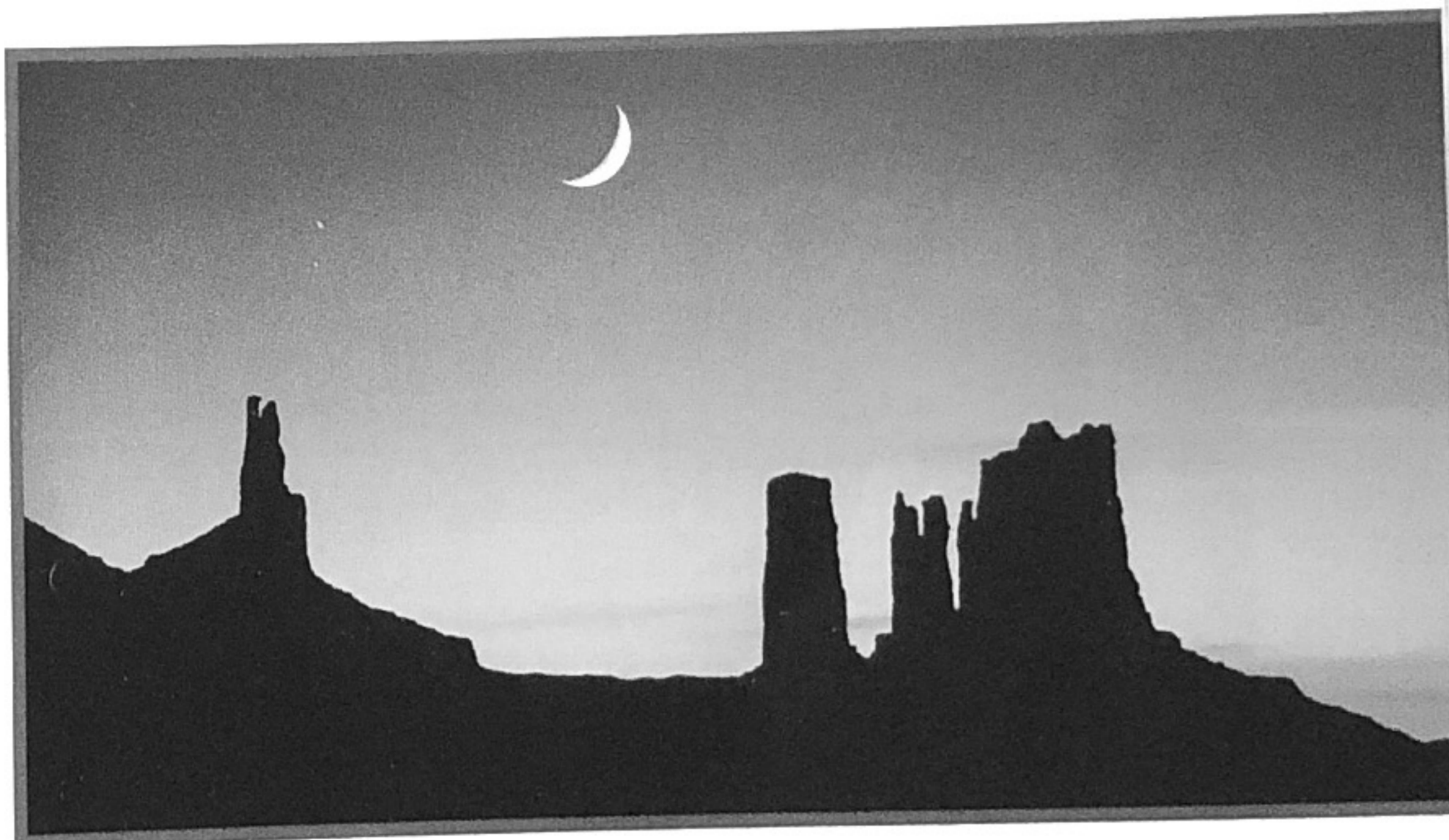
What do you see when you look up at the sky? During the day, you see the Sun. Sometimes you can see the **Moon**. You might see clouds. If you watch long enough, you will see something fly by, such as a bird or an airplane.

At night, you can see different things in the sky. When the Moon is up, it is the brightest object in the night sky. The Moon might look like a thin sliver. That's called a **crescent Moon**. Or it might be big and round. That's called a **full Moon**.

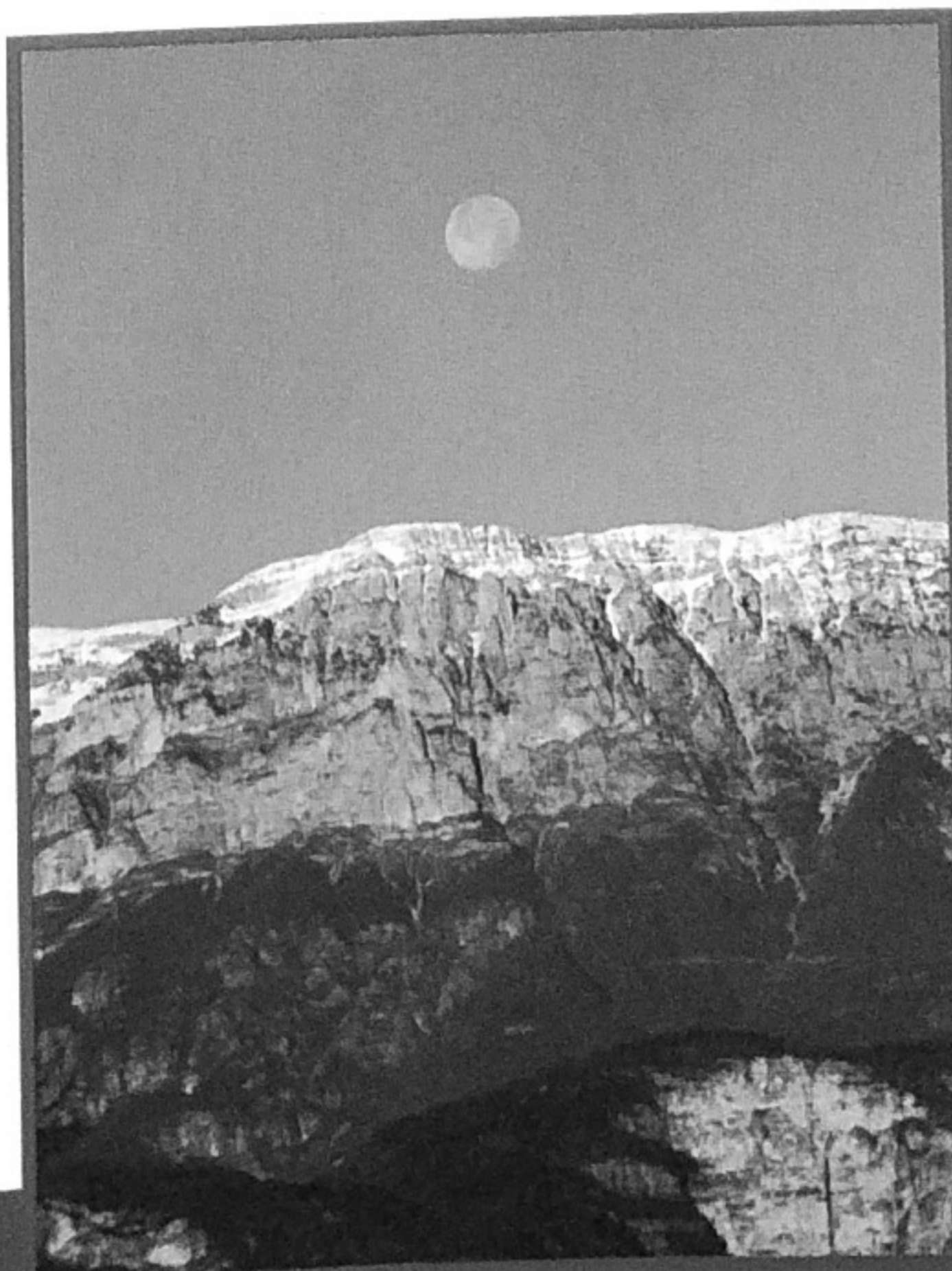
When you see the Moon in the west, it will set soon. When you see the Moon in the east, it is rising. It is easy to predict the time of day or night the Sun will rise and set. It is much harder to predict the time of day or night the Moon will rise and set.



A full Moon over New York City



A crescent Moon



The Moon during the day



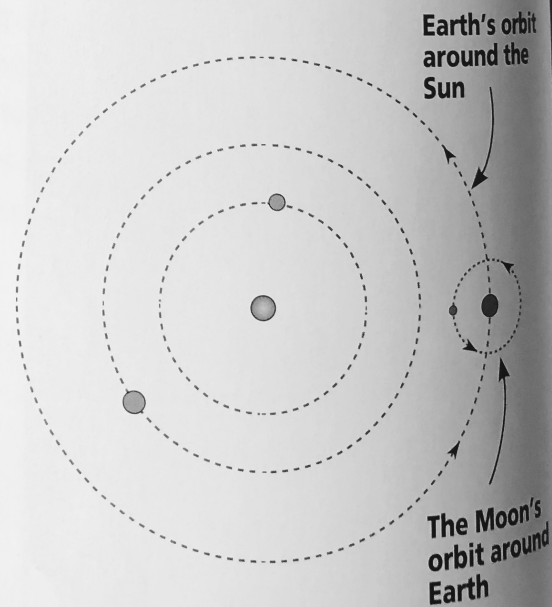
On a clear night, you can see about **2,000 stars** in the sky.

Stars

When it is clear, you can see **stars** in the night sky. Night is the only time you can see stars. Well, almost the only time. There is one star we can see in the daytime. It's the Sun. Our star shines so brightly that it is impossible to see the other stars. But after the Sun sets, we can see that the sky is full of stars. It looks like there are millions of stars in the sky on a clear night. But actually you can see only about 2,000 stars with your **unaided eyes**.

The Moon doesn't always rise and set at the same time. Sometimes it rises in the afternoon. Sometimes it rises in the morning. That's why we can sometimes see the Moon in the daytime sky.

The Moon rises and sets at different times because the Moon is orbiting Earth. The Moon is changing its position all the time.



Earth orbits the Sun, and the Moon orbits Earth.

Planets

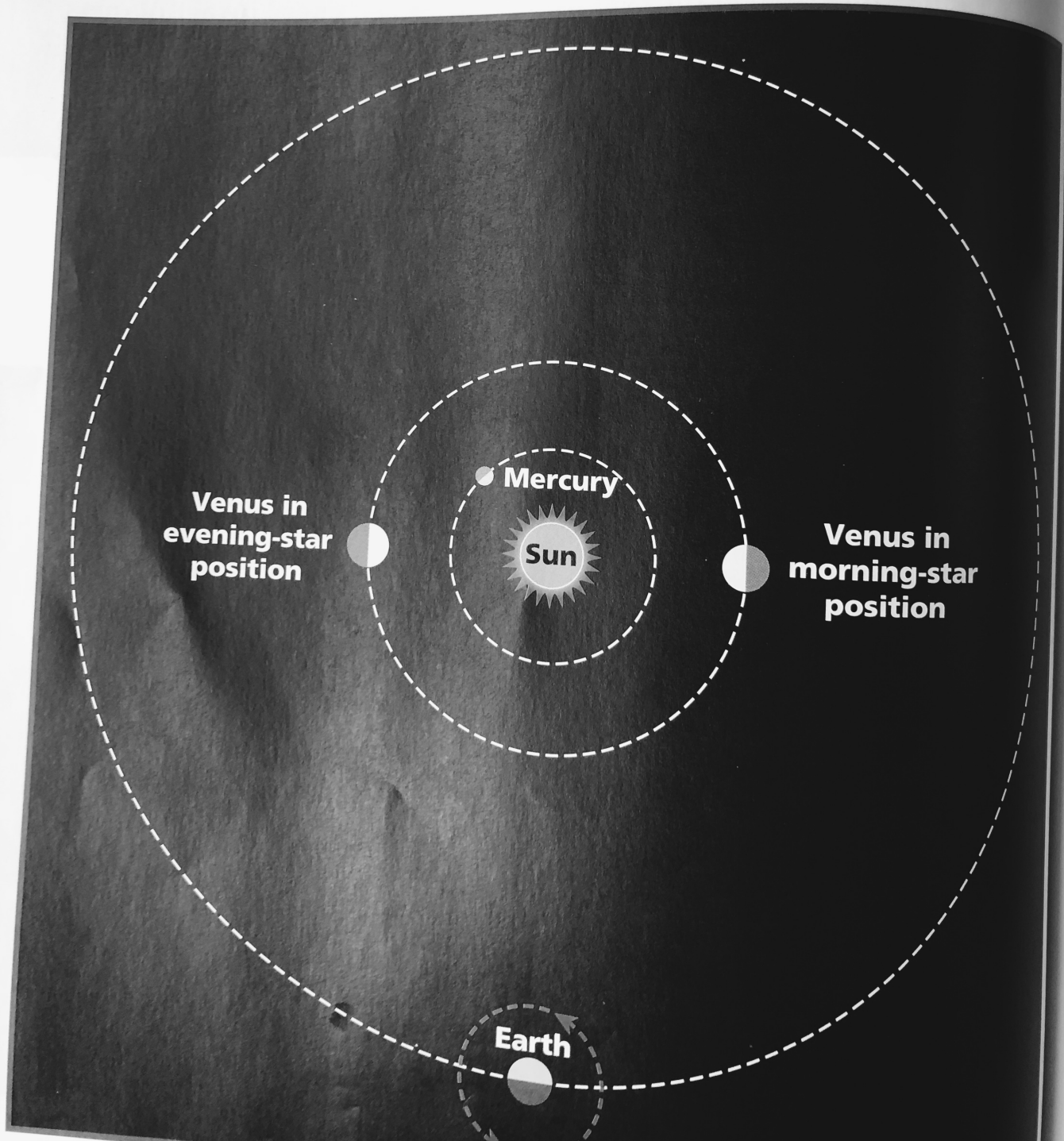
Some stars are brighter than others. They are the first ones you can see just after the Sun sets. Did you ever make a wish on the first star that appears in the evening sky? "Star light, star bright, first star I see tonight. I wish I may, I wish I might, have the wish I make tonight." That star might not be a star at all. The brightest stars are actually **planets**. That's one way you can tell a planet from a star, by how brightly it appears to shine.

Earth **orbits** the Sun with seven other planets and several **dwarf planets**. You can see five planets in the night sky. Venus is one of the planets you might see. Ancient sky watchers called Venus the evening star. It is seen near the western horizon after sunset. Venus was also called the morning star. It is also seen near the eastern horizon just before sunrise. What caused the confusion?

Venus and Jupiter in the eastern sky just before sunrise



Two planets orbit closer to the Sun than Earth does. Mercury is closest to the Sun. Then comes Venus. Venus takes only 225 days to go around the Sun. Sometimes Venus is positioned where we can see it from Earth just before sunrise as the morning star. A few months later, Venus has traveled to the other side of the Sun. Now it is positioned for us to see it after sunset as the evening star. That's why ancient sky watchers thought Venus was two different stars.





Venus is sometimes visible from Earth.

Four other planets can be seen with unaided eyes. Mercury is visible sometimes. Because it is so close to the Sun, it is often lost in the bright glare of the Sun. Mars is the fourth planet from the Sun. It shines with a slightly red light. Jupiter and Saturn are the farthest of the visible planets. Still, they are pretty bright because they are so big.

It is a special night when you can see all five planets together in the night sky. It doesn't happen very often. It happened in 2004. It won't happen again until 2036!

Review Questions

1. What are some of the objects you can see in the night sky that you can't see in the day sky?
2. Which object is the brightest object in the night sky?