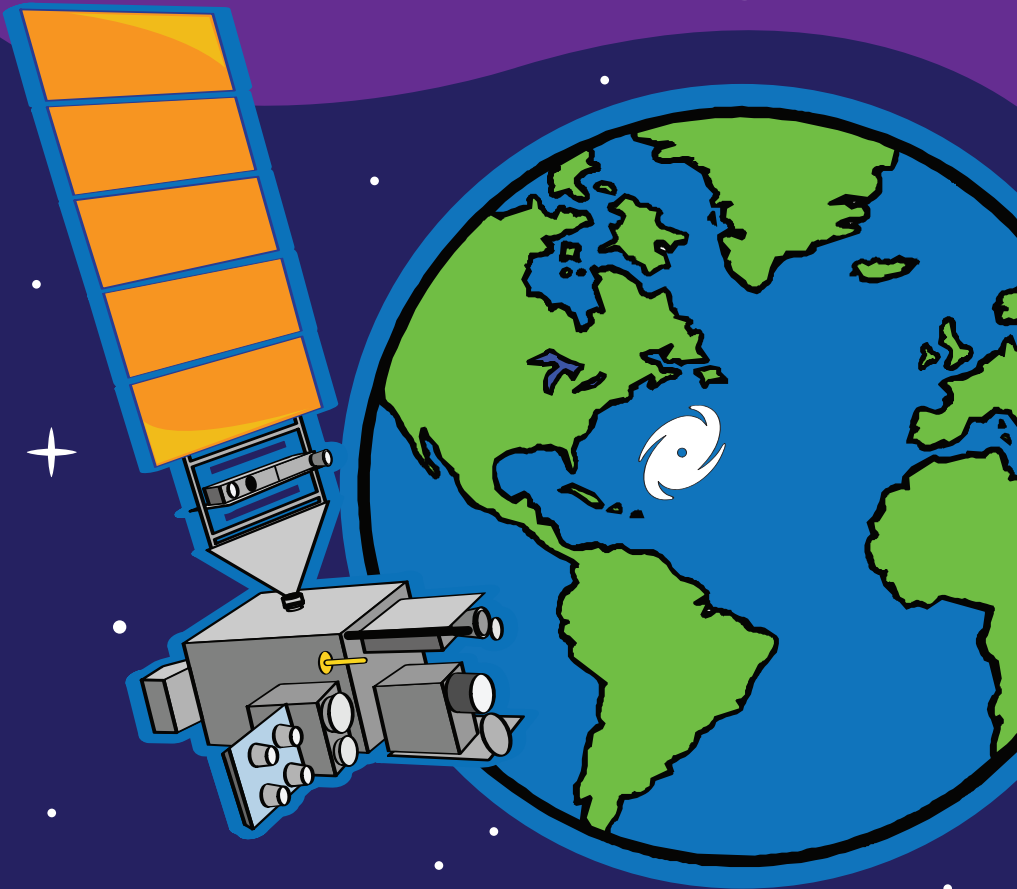




# GOES-R

Fun Activity Book



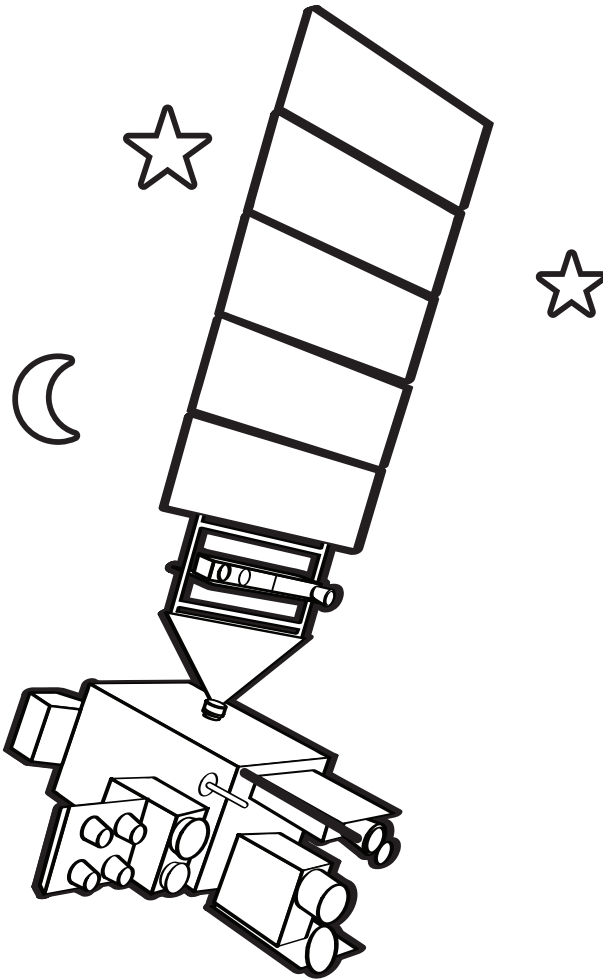
Packed with things to do!

## What is GOES-R?

GOES-R is short for Geostationary Operational Environmental Satellites-R Series. It's a set of weather satellites that are constantly keeping an eye on Earth's weather from space. These satellites orbit 22,000 miles above Earth.

From up there, GOES-R can see weather on Earth in amazing detail, telling the difference between clouds, snow, smoke, smog and ash. These satellites are also great at watching for storms and can help with hurricane, tornado and flood warnings.

This is what a GOES-R satellite looks like. The real one is mostly gray and black, but you can color this one whatever color you like!

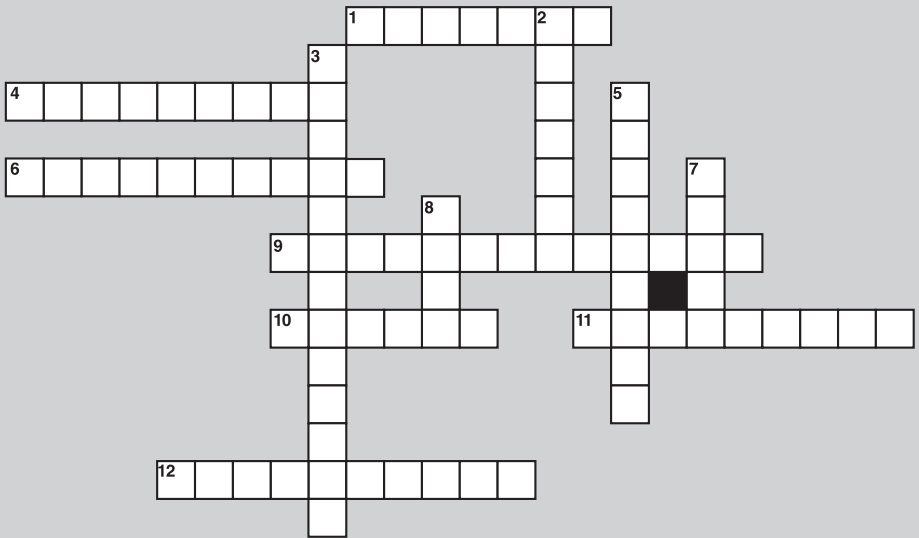


## Storm Dot to Dot

Trace a line between the dots, starting with number 1 and going up. Once you're done tracing, you should see that your outline created a storm. What storm do you see? (Hint: they form most often in the Great Plains states and their winds can travel up to 300 miles per hour!)



## Weather Crossword



### Across

1. This storm looks like a funnel and happens most often in the Great Plains states.
4. A powerful storm that forms over the ocean before hitting land.
6. These machines orbit Earth and can keep an eye on our weather.
9. Rain, snow and sleet are all forms of \_\_\_\_\_.
10. Cumulus, cirrus and stratus are all types of \_\_\_\_\_.
11. These are caused by a spark, but can spread quickly, destroying homes and the environment nearby.
12. The jacket of gases that make up our air and surround our Earth.

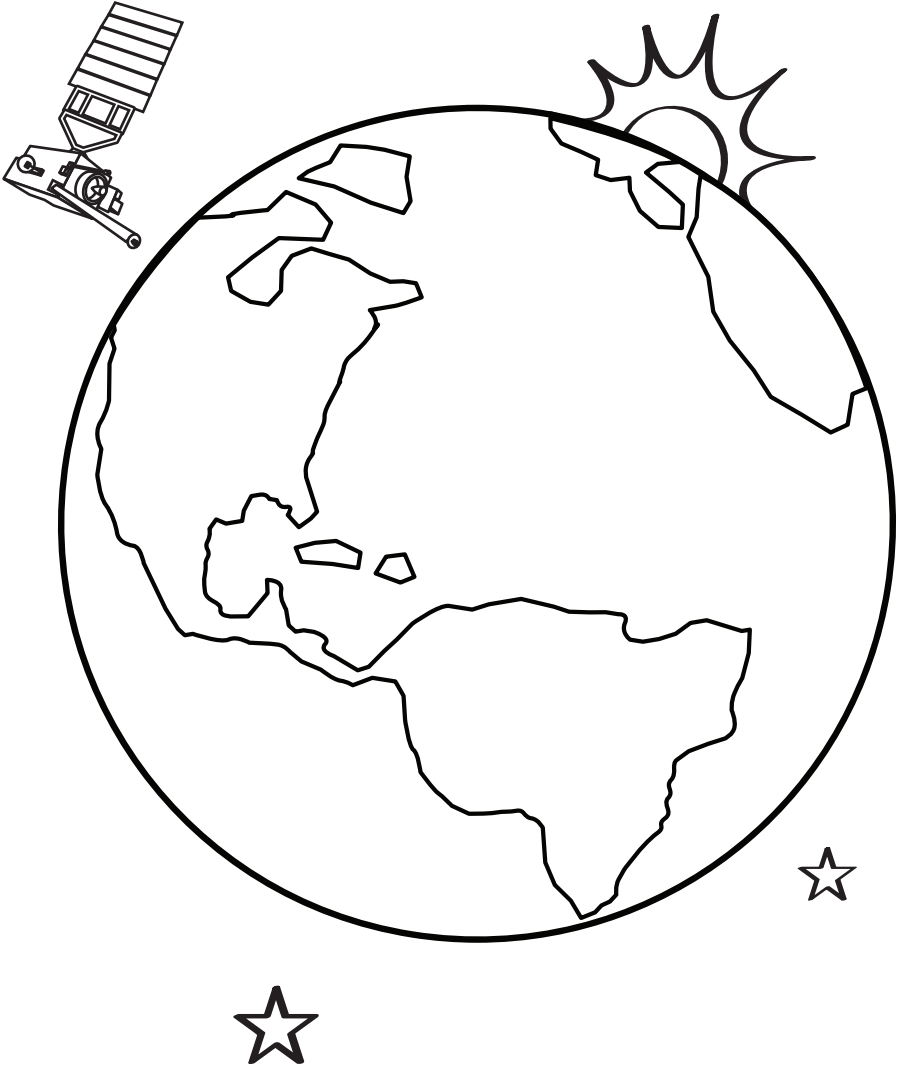
### Down

2. A \_\_\_\_\_ is caused by drier-than-usual conditions that can eventually lead to water supply problems.
3. A scientist who studies weather is called a \_\_\_\_\_.
5. \_\_\_\_\_ begins as static charges in a rain cloud...zap!
7. Heavy rain or rapidly melting snow and ice can cause a \_\_\_\_\_.
8. A gentle breeze or a strong gust are both kinds of \_\_\_\_\_.

## Colorful World

Two weather satellites, called GOES-East and GOES-West, work together to take pictures of the Western Hemisphere from space. These pictures are taken with special cameras that can see clouds, storms, lightning, smoke, dust and other features, too.

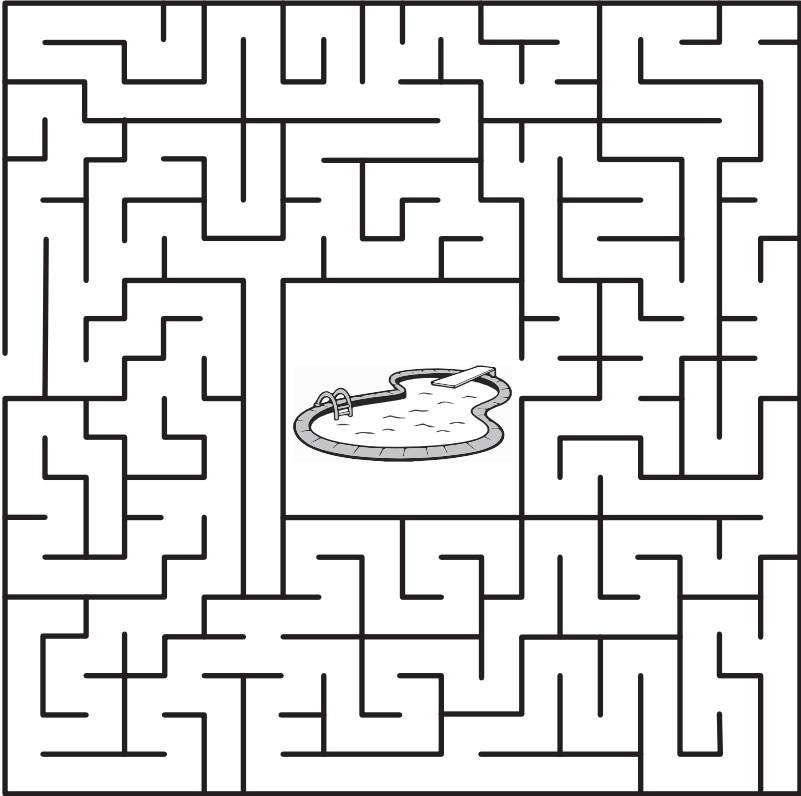
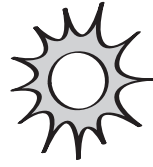
Color this picture of Earth as it appears from the satellites' view in space!



## Escape the Heat!

A heat wave is a period of unusually hot weather that typically lasts two or more days. Heat waves are generally the result of trapped air. Instead of cycling around the globe, the air stays put and warms like the air inside an oven.

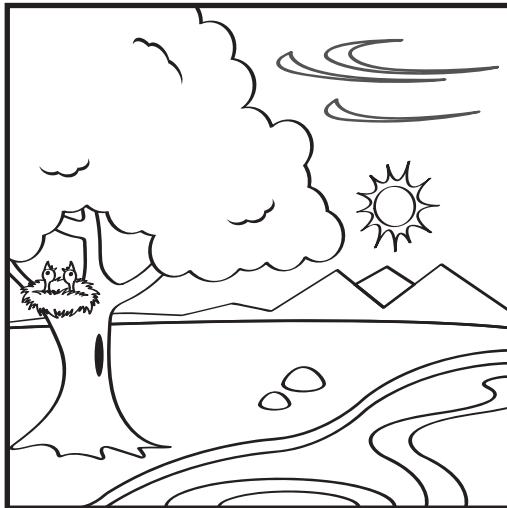
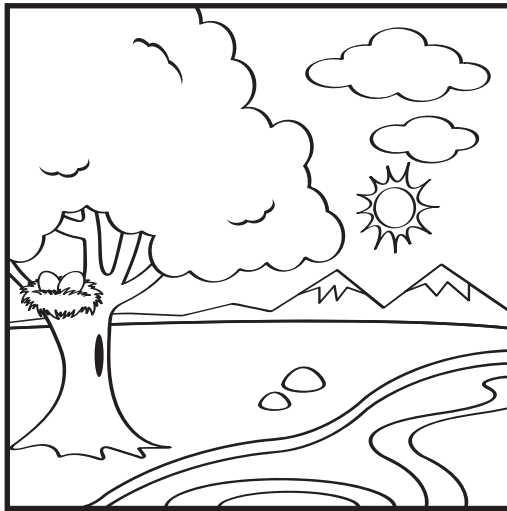
There's a heat wave in town – can you get through the maze and make it to the pool to cool off?



## What's the Difference?

Meteorologists—scientists who study the weather—have to be very observant. For example, they might compare a satellite picture of a hurricane to a satellite picture of the same hurricane from 24 hours earlier. This could show how quickly the storm is moving.

Test your observation skills below! Take a look at these two pictures. There are five differences between these two pictures. Can you find them all?



## Precipitation Word Find

Find these words that relate to precipitation.

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

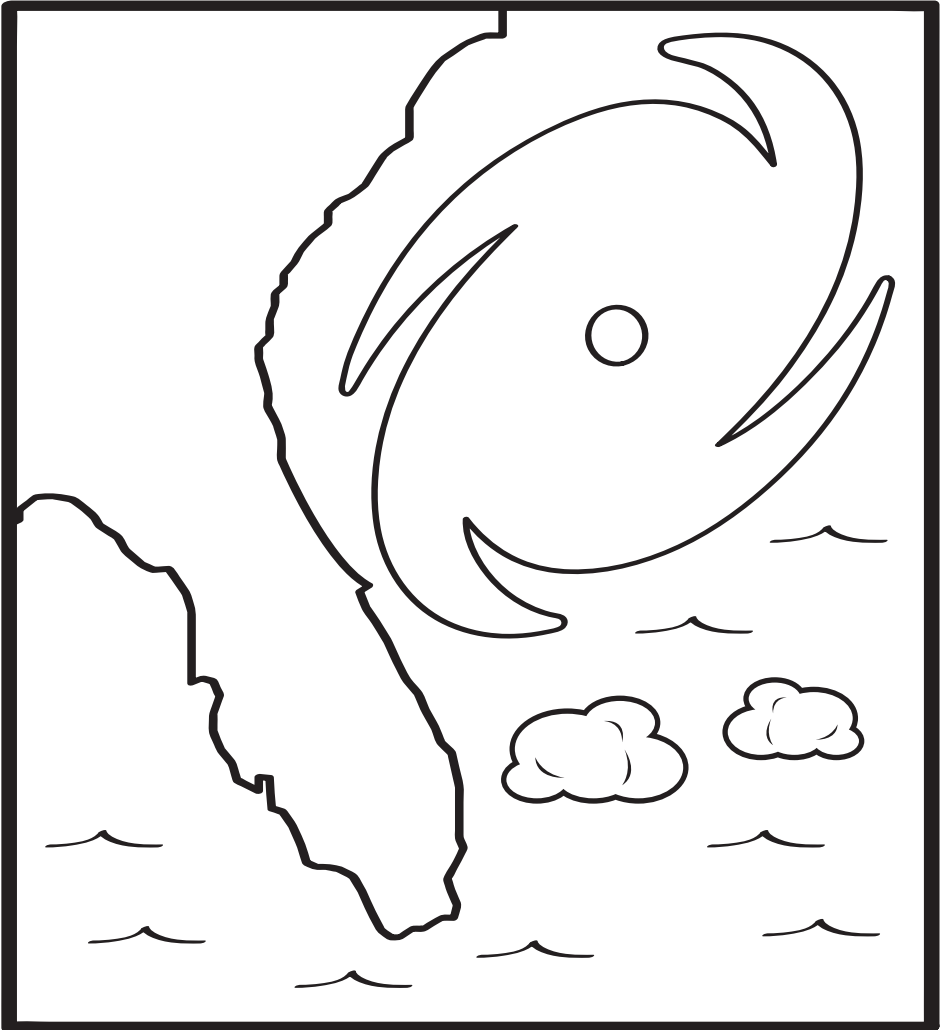
ATMOSPHERE  
CLOUDS  
HAIL  
PUDDLE  
RAIN  
SLEET  
SNOW  
SPRINKLE





## Color up a Storm

Hurricanes are the most violent storms on Earth. They form near the equator over warm ocean waters. The GOES-East weather satellite keeps an eye on weather conditions in the Atlantic Ocean. This view from above can help meteorologists warn people if a severe storm is coming to their area.



## How Many Words Can You Make?

Earth's atmosphere is a jacket of gases that surrounds the planet. The atmosphere gives us air to breathe. It also traps the Sun's heat close to Earth's surface—keeping the planet warm enough to live on. The atmosphere is also where all of Earth's weather happens.

How many smaller words can you make from the letters in "ATMOSPHERE"?

**ATMOSPHERE**

.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



## When Lightning Strikes

Lightning comes from charges that build up within a storm cloud. The electrical charges in the lower part of the storm are opposite to the charges that are on the ground. When these opposite charges become strong enough, there is an electrical discharge—an energy release—in the form of lightning...ZAP!

Color the picture below and draw in lightning where you think it will strike. Remember: lightning can go from a cloud to the ground or from cloud to cloud!



## Find a Pattern

Meteorologists look for patterns in order to make weather forecasts. They take a look at what satellite imagery is showing and what weather is typical in a region to look at how those events impacted the weather in the past. For example: does cloudy weather on a warm spring day usually result in a rainstorm?

Think you can notice patterns like a meteorologist? Try to list the next letter or number in the patterns below!

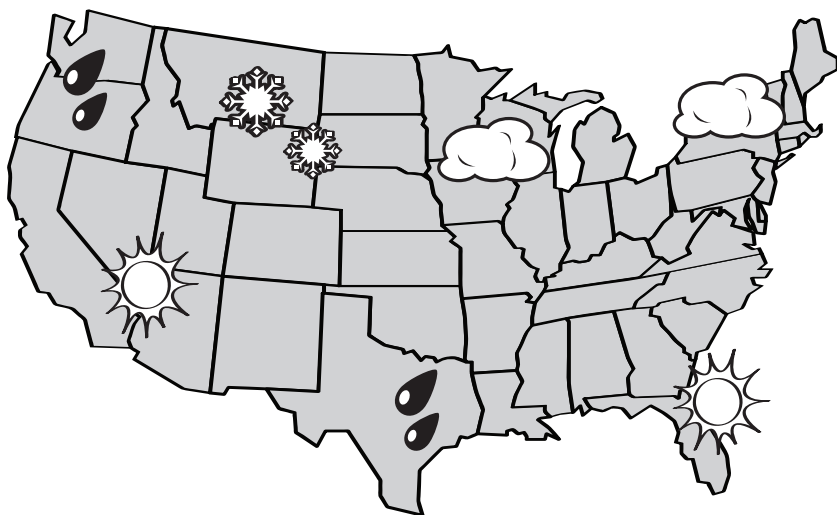
1, 3, 5, 7, 9, \_\_\_\_\_, 13, 15

A, B, D, E, G, H, \_\_\_\_\_, K, M

1, 1, 2, 3, 5, 8, \_\_\_\_\_, 21, 34

B, C, D, F, G, H, J, \_\_\_\_\_, L, M

2, 3, 5, 7, 11, 13, \_\_\_\_\_, 19, 23



## Weather Rhymes

Fill in the rhyming weather words in the story below!

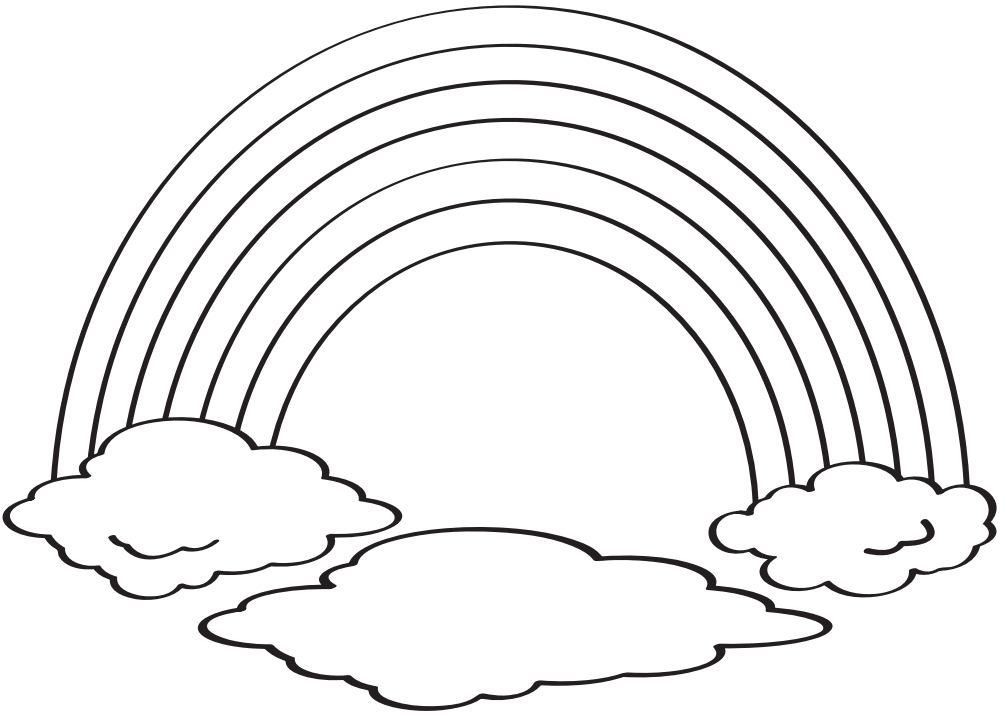
1. Stop! Before you jump on an airplane, you might want to grab your umbrella in case of \_\_\_\_\_.
2. When the electrical charge in a cloud differs from the charge of the ground down under, be on the lookout for lightning and \_\_\_\_\_.
3. If it's sunny after a rain, you might want to walk slow; if you look carefully, you might see a colorful \_\_\_\_\_.
4. A huge spiraling storm that hits land bringing wind and rain is most often referred to as a \_\_\_\_\_.
5. Low tide has passed and high tide will be soon! Did you know that tides are caused by the \_\_\_\_\_?
6. If the rain keeps coming and the ground is all mud, you might be in danger of seeing a \_\_\_\_\_.



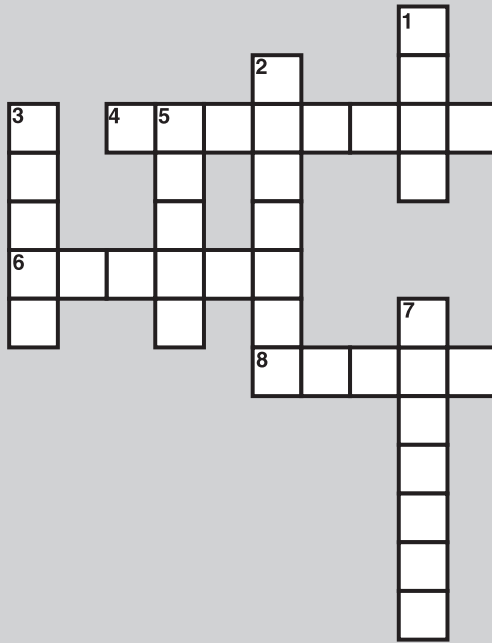
## What Causes a Rainbow?

Sunlight is made up of many wavelengths—or colors—of light. When sunlight enters water droplets in the sky, the light bends. Some of those wavelengths bend more than others. Violet light bends the most, red light bends the least. So, when the light exits the water droplet, it is separated into all its wavelengths.

Can you color this rainbow with the colors in order?



## What's the Weather Word?



### Across

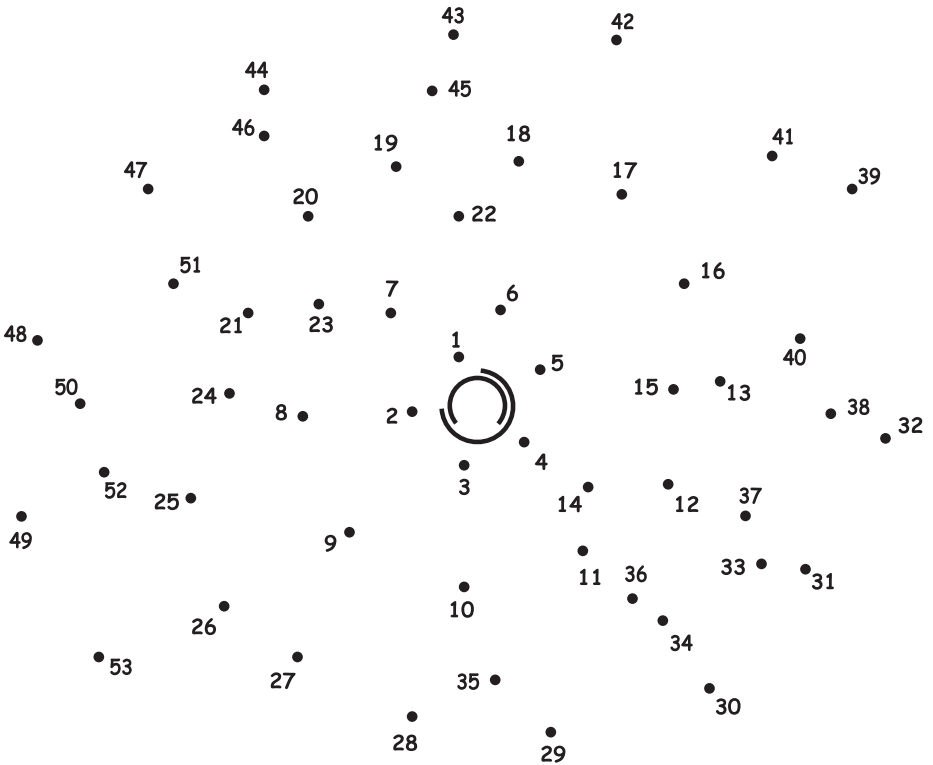
4. A weather \_\_\_\_\_ will tell you if there be a hot weather or a bad storm in the next few days.
6. \_\_\_\_\_ is a weather pattern in the Pacific Ocean that can cause more rain than usual in South and Central America and in the United States.
8. \_\_\_\_\_ weather is a set of conditions caused by the sun.

### Down

1. A \_\_\_\_\_ storm is a wall of dust and debris that is often blown into an area by strong winds from thunderstorms.
2. Earth has \_\_\_\_\_ because its axis is tilted.
3. When \_\_\_\_\_ condenses up in the atmosphere, it can form a cloud; when it condenses near the ground, it forms fog.
5. Satellites travel around Earth in an \_\_\_\_\_.
7. A solar \_\_\_\_\_ happens when, at the right moment, the moon comes between the sun and Earth.

## Storm Dot to Dot

Trace a line between the dots, starting with number 1 and going up. Once you're done tracing, you should see that your outline created a storm. What storm do you see? (Hint: they form over the ocean and have an "eye" in the center.)

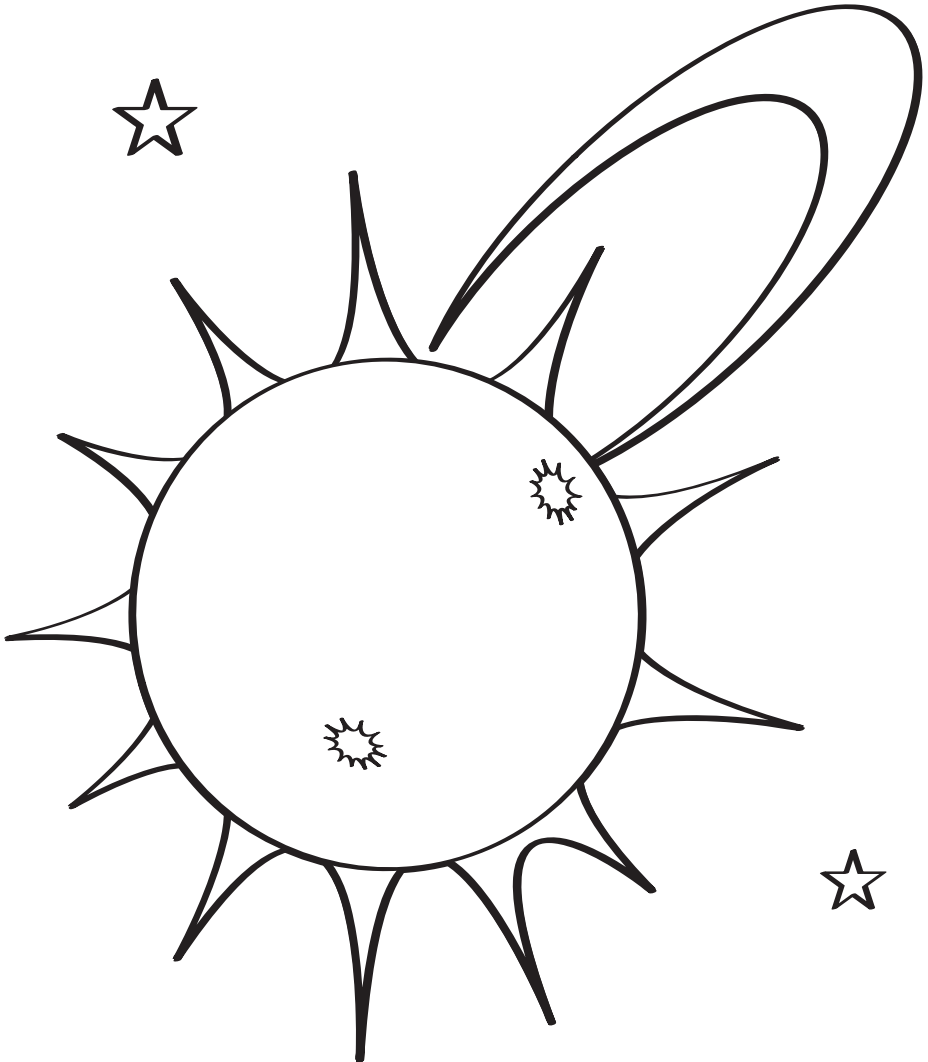




## Color the Sun!

Space weather is caused by our local star, the sun. In addition to sunlight, the sun constantly streams a wind of particles, called the solar wind, into space. And sometimes the sun releases giant bursts of energy called solar flares.

These bursts of particles can damage satellites, power lines, and radio communications. No worries though! The GOES-R Series satellites can keep an eye out for the first signs of a solar flare.



## Cloud Word Find

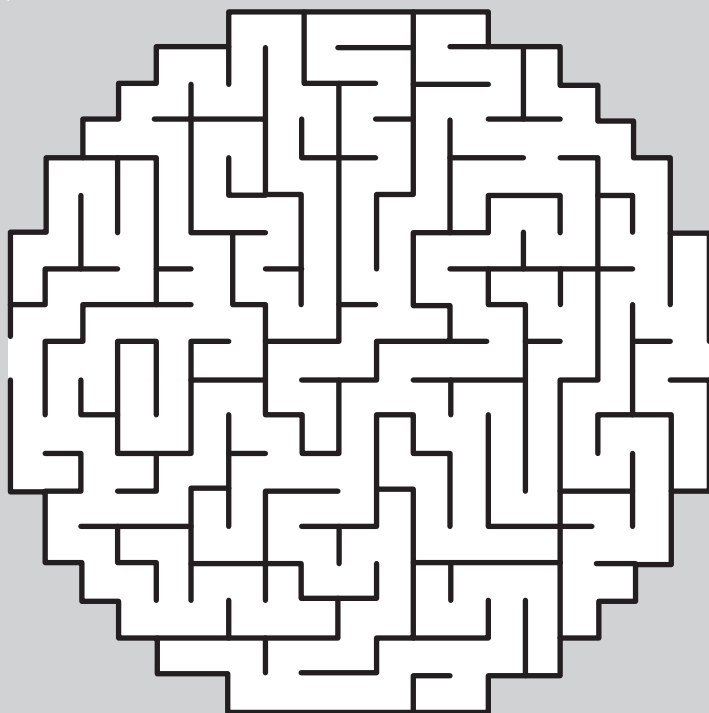
T D G C F E Y R S M L G E C M  
E V V Z J A S K U B O A S I R  
I B F J Y T E C B F H Y J H O  
T L I J R T Y M M A V E X T T  
L V T A I C E S I B Y L Q O S  
X E T C O N D E N S A T I O N  
O U N V P F O Z O W G Y Q S V  
S R L T S Z Q I L L Y P C I C  
V Q E K I P V N U D P O E T U  
X I E T D C B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

CIRRUS  
CONDENSATION  
CUMULONIMBUS  
CUMULUS  
FOG  
ICE  
LENTICULAR  
STORM  
STRATUS  
WATER



## Snowflake Maze

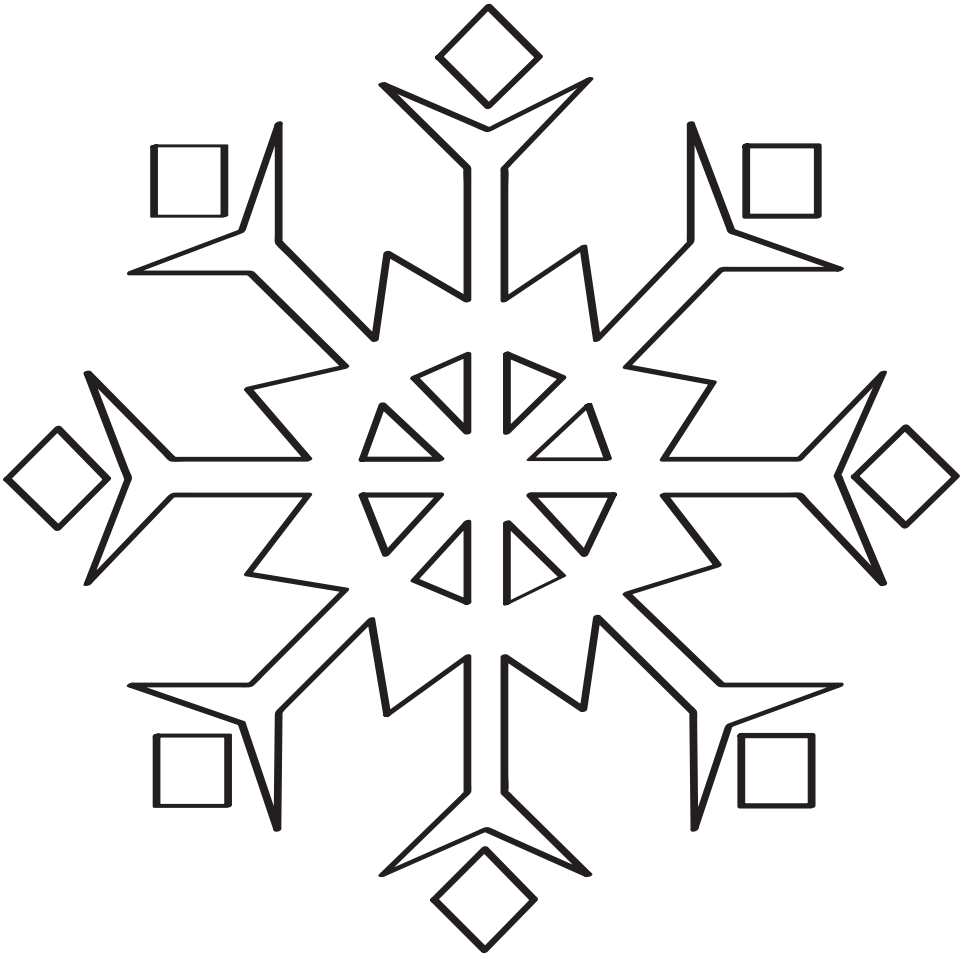
Find your way from one side of the snowflake to the other!



## Color a Snow Crystal!

Every snowflake is a crystal with six sides, but these crystals come in all different arrangements and sizes. As a snowflake forms, it can move to different parts of the cloud. Differences in temperature and humidity affect the snowflake's shape.

Color these different snowflake shapes!



## Find the Severe Weather Words

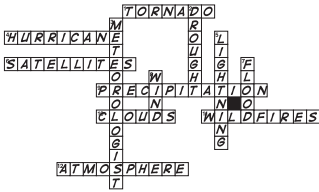
A O N U U V E E X O G P D T P  
J L Q R A Q V J D Z O B R E N  
N S L V F A T F A L P A A O V  
A J R E W C O D A T G K Z T I  
H D C T C B E R Q Q M B Z D T  
G B A I F R V X A O P Z I R K  
Q E U L R O E D T N U X L O Q  
H I O E R L B P E F H Y B U K  
B O K T B Y D I U R Z J L G C  
D E E T S A E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

BLIZZARD  
FLOOD  
POLAR VORTEX  
DERECHO  
HEAT WAVE  
SUPERCCELL  
DROUGHT  
HURRICANE  
TORNADO

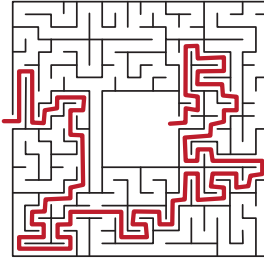


# Answer Key

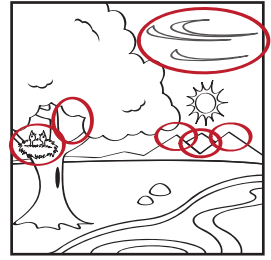
## Page 3



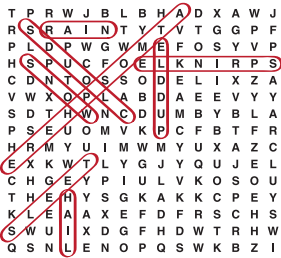
## Page 5



## Page 6



## Page 7



## Page 11

1, 3, 5, 7, 9, 11, 13, 15

A, B, D, E, G, H, J, K, M

1, 1, 2, 3, 5, 8, 13, 21, 34

B, C, D, F, G, H, J, K, L, M

2, 3, 5, 7, 11, 13, 17, 19, 23

## Page 12

*RAIN*

2. *THUNDER*

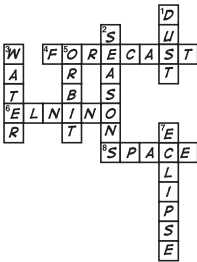
3. *RAINBOW*

4. *HURRICANE*

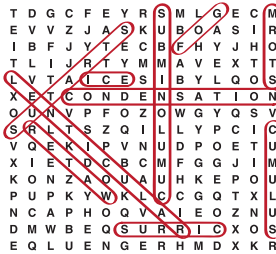
5. *MOON*

6. *FLOOD*

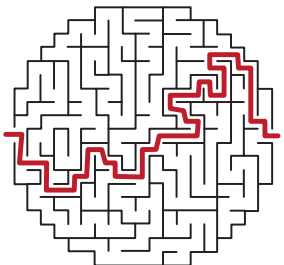
## Page 14



## Page 17

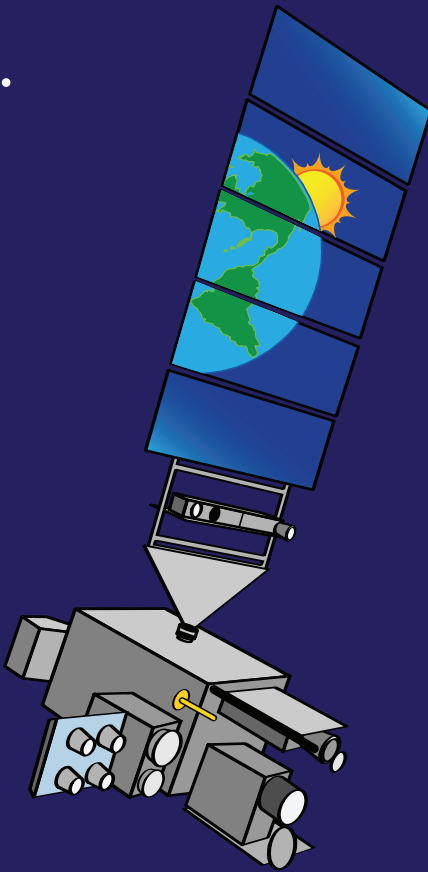


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## Page 20





For more information, visit the GOES-R website at [www.goes-r.gov](http://www.goes-r.gov).

For information for students, visit the NOAA SciJinks website at [scijinks.gov](http://scijinks.gov).



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