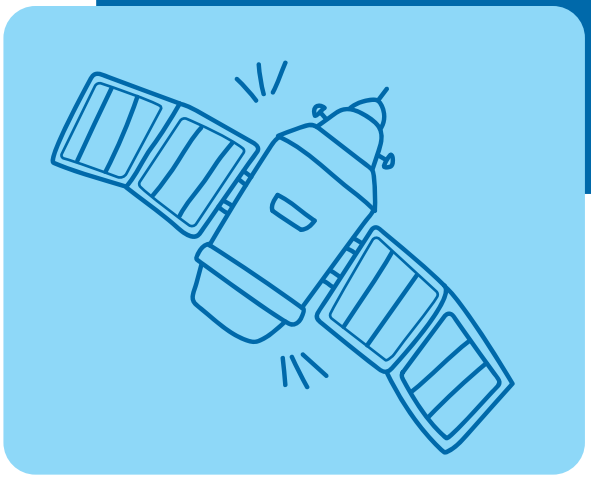
Conduct a Sky Survey



SCIENCE ACTION CLUB

CLOUD QUEST

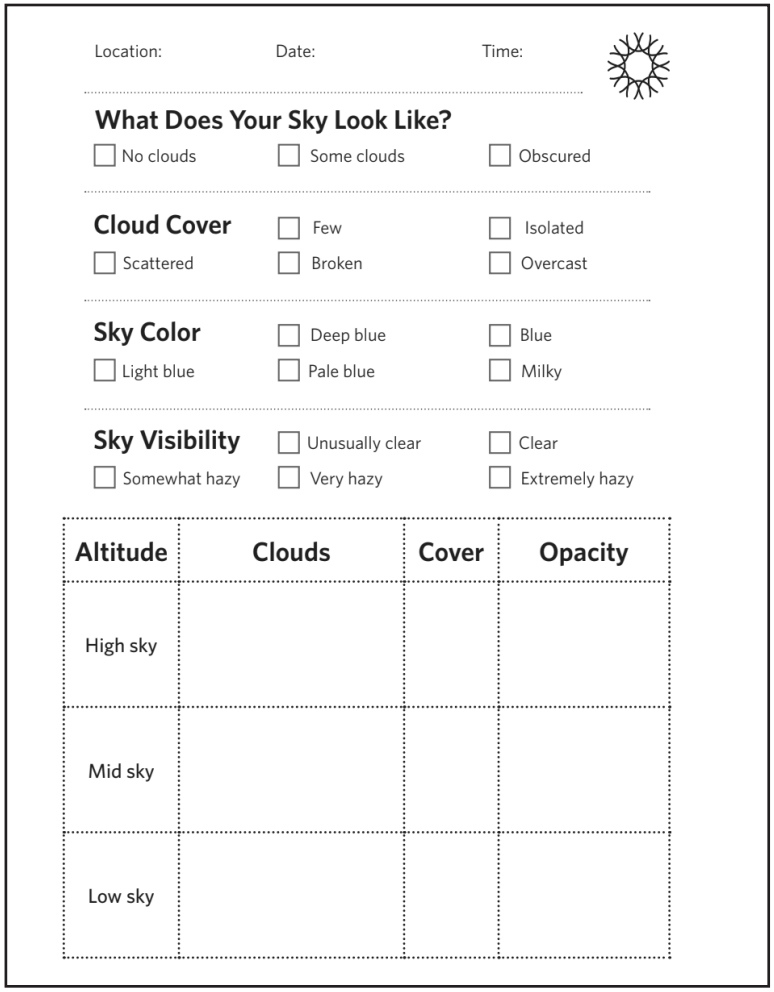
1 What is a Sky Survey?

By observing the sky from the ground and reporting what you see in your Sky Survey, citizen and community scientists like you can help NASA researchers track changes in sky and cloud conditions to support Earth science research. Clouds affect weather and climate by controlling the flow of energy through Earth's atmosphere. Since clouds can change rapidly, scientists need frequent observations from citizen and community scientists to better understand cloud cover over Earth's surface.

2 Conducting a Sky Survey

First, grab a notebook or piece of paper and copy the Sky Survey chart:

The first set of information to collect is the date, time and place you are conducting your Sky Survey. As scientists, it is necessary to keep accurate records of when and where data is collected and observations are recorded.



Location: Date: Time:

What Does Your Sky Look Like?

☐ No clouds ☐ Some clouds ☐ Obscured

Cloud Cover ☐ Few ☐ Isolated ☐ Scattered ☐ Broken ☐ Overcast

Sky Color ☐ Deep blue ☐ Blue ☐ Light blue ☐ Pale blue ☐ Milky

Sky Visibility ☐ Unusually clear ☐ Clear ☐ Somewhat hazy ☐ Very hazy ☐ Extremely hazy

Altitude	Clouds	Cover	Opacity
High sky			
Mid sky			
Low sky			

LOCATION: SAN FRANCISCO DATE: 12/1/22 TIME: 9:30 AM

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CLOUD COVER ☐ FEW ☐ ISOLATED ☐ SCATTERED
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ALTITUDE	CLOUDS	COVER	OPACITY
HIGH SKY			
MID SKY			
LOW SKY			

Let's walk through the steps of what observations you will make before heading outside with a trusted adult.

First, look up at the sky (but not directly at the sun) to determine the sky condition. There are three basic sky conditions: no clouds, some clouds or obscured. Obscured doesn't mean overcast—it means clouds can't be seen in more than one-quarter of the sky because of heavy rain, snow, or fog. Once you've determined your sky condition, record it on your paper. This may take some discussion with your trusted adult or other people you are doing a Sky Survey with.

What Does Your Sky Look Like Above the Horizon?

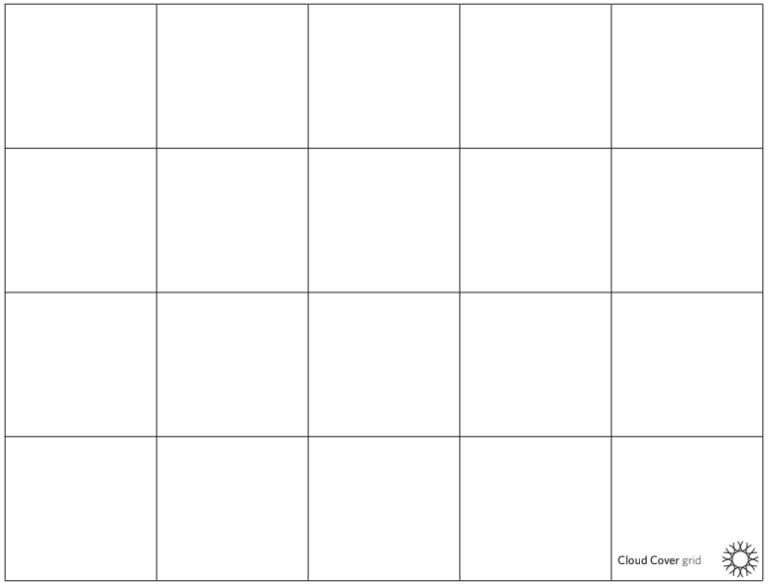
Take a moment to observe the sky from all directions.

No clouds

Some clouds

Obscured

Next determine cloud cover. You can use a transparent plastic bag, roughly the size of a piece of paper (8.5 x 11 inches), to draw a 5x4 grid like the one below:

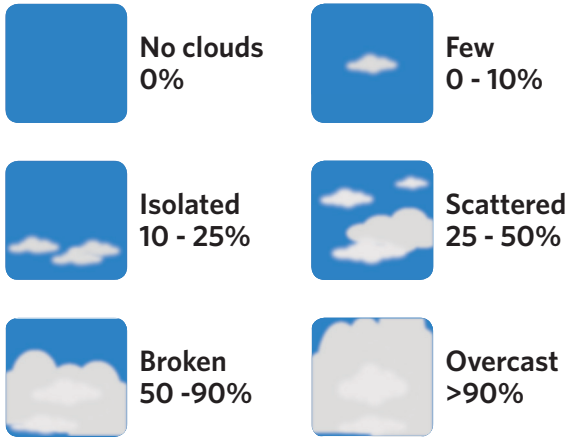


Ziploc

Hold the grid up to the sky and see how many squares are filled with clouds. Each square represents 5% of the sky. Multiply the number of squares with clouds by five to determine the cloud cover percentage using the chart below:

Cloud Cover

Use the *Cloud Cover* grid to determine cloud cover for each part of the sky and then estimate the cloud cover for the entire sky.



No clouds
0%

Few
0 - 10%

Isolated
10 - 25%

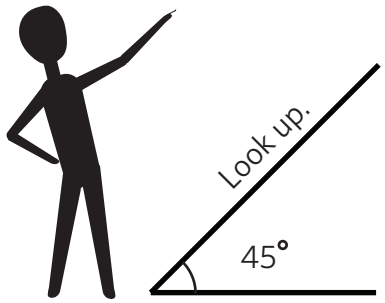
Scattered
25 - 50%

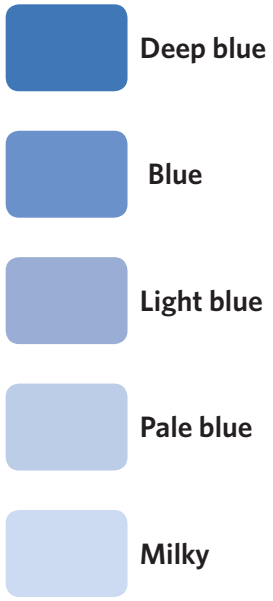
Broken
50 -90%

Overcast
>90%

Sky Color

Record sky color when cloud cover is 50% or less. With your back to the Sun, look up at a 45° angle and at the deepest blue part of the sky. Then use the *Sky Color* strip to pick the shade that most closely matches your sky.





Deep blue

Blue

Light blue

Pale blue

Milky

You can practice by using the Cloud Cover Photos and placing the Cloud Cover grid over it. From there calculate the cloud cover in the photo. After you have finished your calculations you can record it in the Sky Survey chart.

Next, using the sky color strip on a computer or smartphone, hold it up at a 45º angle to the sky. Match the darkest part of the sky to the corresponding color on the strip and record it on your chart.

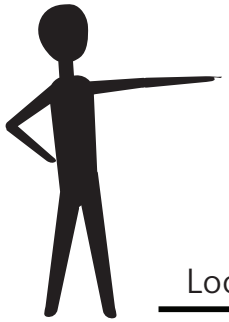
Sky Color Strip

Locate the PDF titled *Sky Color Strip* and use it for this portion of the activity.

Now, look straight across the horizon to determine and record visibility using the chart below:

Sky Visibility

Look across the horizon and use local landmarks as a visual reference. Try to use the same landmark each time you observe visibility.



Unusually clear

Clear

Somewhat hazy

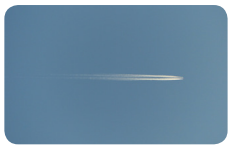
Very hazy

Extremely hazy

Different types of clouds form at different altitudes in the sky. You may not see every type of cloud in the sky, but using the chart below determine which clouds you can see at the low, middle and high parts of the sky:

High in the Sky

Which contrails are present? Count the number of each type of contrail.



Short-lived

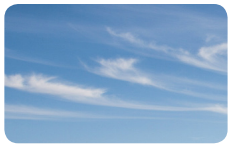
Persistent non-spreading

Persistent spreading

No contrails

What percent of the high sky is covered by clouds?

Which high-level clouds are present?



Cirrus

Cirrocumulus

Cirrostratus

No high-level clouds

What is the visual opacity of the high-level clouds?

Opaque

Translucent

Transparent

Middle of the Sky

Which mid-level clouds are present?


Altostratus


Altocumulus


No mid-level clouds

What percent of the mid sky is covered by clouds?

What is the visual opacity of the mid-level clouds?

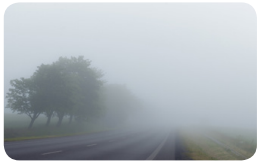

Opaque


Translucent

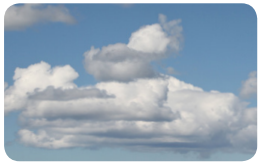

Transparent

Low in the Sky

Which low-level clouds are present?


Fog


Stratus


Stratocumulus


No low-level clouds

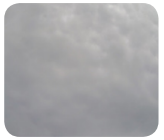

Cumulus


Nimbostratus


Cumulonimbus

What percent of the low sky is covered by clouds?

What is the visual opacity of the low-level clouds?


Opaque


Translucent


Transparent

Be sure to write down all the types of clouds you saw. Finally, look at the ground below your feet. Is it muddy, dry or full of ice? Use the chart below to determine the surface conditions and record them in your Sky Survey chart.

Surface Conditions

Look for the following around your search area.

Snow/ice

Standing water

Muddy

Dry ground

Leaves on trees

Raining/snowing

3 Head outside for a Sky Survey

Now that you have all the steps and basic materials, you can now head outside and conduct your Sky Survey. If it's not safe for you to be outdoors, you can stay inside and conduct your Sky Survey from a window. Reference the *How to do a Sky Survey* video for step-by-step directions.

How to do a Sky Survey

Use the video titled *How to do a Sky Survey* as a step-by-step guide when conducting a Sky Survey.