Lesson 1.6 - Expert Cloudspotting

Spotting Rare and Extra-special Clouds

Objective: In this lesson, students learn about some rare and extra-special formations. Mindfulness strategies presented in all the lessons are reviewed. Students develop an excellent foundation for cloud spotting and emotional resilience building.

Time: 45-90 minutes depending on activity options selected and teacher preference.

Materials:

1. Print 'Rare and Extra Special Clouds' printout or download image slideshow for screen display.

Lesson Prep:

1. Gather all the photos students have photographed throughout the module of lessons and create a slideshow.
2. Prep videos for display

Resources:

1. 'Rare and Extra Special Clouds' printout and image slideshow.
2. Time-lapse videos of horseshoe vortex clouds:
    a. https://www.youtube.com/watch?v=99tSWPXy9sg
    b. https://www.youtube.com/watch?v=I8pTV1yiGOQ
3. The Cloud Appreciation Society videos page: https://cloudappreciationsociety.org/cloud-videos
4. 'Extreme cloudspotting' video of skydivers in wingsuits: https://www.youtube.com/watch?v=F29kpua3Im4

Review previous lesson: Rain clouds are known as Nimbostratus and Cumulonimbus. (Nimbus is the Latin for a rainy cloud.) Using Gratitude helps get through stormy emotional times. What were students grateful this last week?

Lesson Intro: We already have learned about the ten main types. Sometimes these main clouds can appear in distinctive patterns or have weird cloud features attached to them. In this lesson, we will look at three of these cloud types that are quite rare and hard to spot to show what it is like to become an expert cloudspotter.

The undulatus cloud pattern

Of the three clouds we are going to look at in this lesson, this is the one you're most likely to spot. We describe one of the ten main clouds as undulatus when it is arranged into rows of clumps or rolls. Undulatus clouds sometimes have spaces between the rows and sometimes they are joined-up:

Undulatus clouds: sometimes with gaps and sometimes joined-up

What does the pattern of undulatus remind you of? <Ask students to make suggestions>

One thing undulatus clouds can look like is the pattern of ridges that you sometimes see on the sand at the beach.

You can see this pattern in several of the ten main cloud types. When the low clumpy layer of cloud known as Stratocumulus forms in an undulatus pattern the rows look big because the cloud rows are nearer to you. When the high clumpy layer known as Cirrocumulus forms in an undulatus pattern they look much smaller because the cloud is much further away from you:

Undulatus looks big in low clouds (Stratocumulus) and small in high clouds (Cirrocumulus)

Fluctus cloud features

The fluctus cloud looks like breaking waves. It sometimes looks like a whole bunch of breakers, one behind the other.

Surf's up! The fluctus cloud looks like ocean breakers in the sky.

The fluctus cloud is a bit like the undulatus because it is a pattern of regular bumps, but the important difference is that only with a fluctus do the tops of the bumps curl over. You have to be pretty lucky to spot this cloud because it doesn't happen often that the sky has a whole line of breaking waves in it!

A fluctus cloud like these are rare.

Even though dramatic examples of fluctus are rare you'll have a good chance of spotting the curls of fluctus if you pay careful attention to the top of Cumulus clouds. When it is windy up at the level of the clouds, a fluctus curl will sometimes appear on top of a Cumulus. They only last for a couple of minutes, so you have to be paying attention. Next time there are Cumulus clouds on a windy day, see if you can spot a fluctus feature forming on top of one.

Your best chance of spotting a fluctus feature is on the top of a Cumulus on a windy day

Horseshoe vortex cloud

This one is really rare. It is a twisting ribbon of cloud that is shaped like a horseshoe. If you are ever lucky enough to spot a horseshoe vortex cloud, keep watching it because this cloud only appears for 5 minutes before breaking up. Watch as it changes shape.

The horseshoe vortex cloud

This cloud starts out as a flat roll of cloud. This twists gently like a tiny little tornado on its side. It then starts to curve upwards in the middle to take the shape of a horseshoe. This is because it forms on top of an invisible column of air rising from the ground. When that rising air hits wind blowing up above, it starts to twist at the top. The cloud forms in the middle of this little twist of air.

Here are some horseshoe vortex clouds filmed in time-lapse:
https://www.youtube.com/watch?v=99tSWPXy9sg
https://www.youtube.com/watch?v=I8pTV1yiGOQ

Because this cloud is rare and only forms for a few minutes, you have to be an expert cloudspotter to see one. Luckily, it's easy to become an expert cloudspotter. You just need to look up more often. If you look up often enough, one day you might see a cloudy horseshoe in the sky.

You have to be an expert cloudspotter to spot a horseshoe vortex cloud!

Activity Options:

Option 1 (No preparation): Outside observation

PRIMARY & SECONDARY: Watch some of the time lapse videos on Cloud Appreciation Society video page and see if you can spot any extra-special clouds.

Option 2: (Some preparation)

PRIMARY & SECONDARY:

Option 2a Draw the three special types mentioned above.

Option 2b "We're Going On A Cloud Hunt!"

The following website can be used in various ways to see what the sky is like at present in different locations around the world. A worksheet could be produced for predetermined locations or for a more customised search (eg, 6 locations of their choice).

https://www.skylinewebcams.com

How about cloudspotting from Space? Clips from the Nasa website would enable pupils to see the atmosphere over different parts of the world:

https://www.nasa.gov/mission_pages/station/videos/index.html
The Earth Day 2021 video has lots of good images of the atmosphere.

SECONDARY

Option 2c Get the students to compare which rare and unusual clouds they found over the course of these lessons. Ask the students to judge the photos if each cloud is a low, mid, or a high level cloud.

Option 3: (More preparation)

PRIMARY & SECONDARY:

Option 3a Extreme Cloudspotting: These skydivers are flying around Cumulus clouds. The cloud types may be everyday, but this is an extreme way of spotting them!:

https://www.youtube.com/watch?v=deiB_rk9ASc

PRIMARY: From there they can let their imaginations take them on a cloud hunt. Students talk about their feelings as they come across different cloud types: what they could see, what it felt like.

SECONDARY Sky Glider- Write or discuss how the sensations and emotions with the different clouds, how high they were, what the atmospheric conditions were like, and how it changed.

Option 3b SECONDARY: Students work in groups of 2-3 to create a digital poster to present the expert cloud of their choice. Depending on groups, assign 2-3 different clouds.

Option 3c PRIMARY & SECONDARY: Slideshow presentation of student's spottings over the course of the cloud lessons.

Mindfulness

Students are empowered with several tools to calm their bodies and minds down, not only to help them spot clouds better, but also to navigate all the complex emotions they experience and will continue to experience. Just like all these extra special clouds, there are complex emotions that can be difficult to describe. SECONDARY students can explore the broad range of emotions, both that present when needs are and are not met.

Review Mindfulness strategies:

1. 5-4-3-2-1 Observations
2. Cloud Breathing
3. 3 Mindful Breaths
4. Cloud Breathing
5. Gratitude Practice

Encourage students that when they look to the sky, the clouds will remind them that they will have emotions come and go, sometimes flowing slowly through them, or rapidly like a storm. The more they practice paying attention to their emotions, the better they will learn to let the emotions come and go. Your class may choose to do a mindfulness strategy during each subject, at specific breaks, or after lunch. As a teacher, you can explore how to create a mindfulness or calm classroom area where students can go to do mindfulness and utilize different calming manipulables.

Assessment: Name the three extra special clouds students learned today; undulatus, fluctus, and horseshoe vortex. These are just a few of the extra special and rare clouds. More to come in future lessons.

Conclusion:

Getting to know the sky has just started with these short lessons. We learned how easy it is to look up and become aware of the clouds. Just thinking about the clouds will help us look at them and see different skies almost every day.

Clouds are made up of simple ingredients and even though they look light and fluffy, they are heavy like elephants. There are ten main cloud types and we hope you learn each of these first, then try your best over the coming weeks, months, and years, to learn all the complex Latin names for all the amazing and extra special clouds (we think they are the most fun to spot and knowing their names even makes it better).

Clouds are the source of rain, snow and hail, and now you know that the water droplets up high in a tall cloud turn into ice-crystals that can start to fall as rain or snow. Sometimes falling ice crystals make beautiful streaks in the sky we call Cirrus clouds.

Clouds and mindfulness go together like peas and carrots (what else go together well that people will know). Next time you see a big fluffy cloud in the sky, inhale the white of that cloud and exhale back to it.

The next modules will explore the many optical effects caused by clouds (rainbows are just the beginning!), what causes the many strange and rare patterns and features that appear in clouds, how storms form and how they can be destructive with tornadoes, <more details to come>.

Alternative/Additional Activities:

1. Sky Beach Reflections: If the beach is nearby, take students down at low tide to see the patterns in the sand are like a reflection of undulatus and look at the waves to see earthbound fluctus. Links to science work in tides and wave movement in geography.
2. An art activity here could be to give students a coloured piece of paper, eg, grey. Draw a horizon line low down on the page. Using white chalk and dark charcoal to blend and rub together draw a cloud filled sky. Add in interesting shapes. Find pictures of recurring themes or shapes in nature.