

Data Lens: Exploring Earth's Visual Stories

Earth data in your classroom with the goal of building visual and data literacy skills using NOAA data, VTS, and the SOS Explorer® tool

VTS with Maps

Visual Thinking Strategies (VTS) is an arts-based, [research-backed](#) teaching strategy designed for building visual literacy. VTS was developed for use in art museums and has since been adapted for use in museums, schools, and universities for decades. VTS has been shown to improve critical thinking, observation, and social and emotional skills.¹ *Data Lens* uses professionally-sourced scientific data with VTS to improve data literacy with global [mapped visualizations from NOAA](#). Doing these 10-20 minute practices often, you might notice:

- **Improved observation skills:** Students enhance their ability to observe deeply and make sense of complex data.
- **Stronger support for conclusions:** Visual evidence becomes a cornerstone of student observations and inferences.
- **Boosted engagement:** Watch as students ask more thoughtful questions, build on each other's ideas, and actively listen to their peers.
- **Shifted classroom culture:** Create an environment where curiosity thrives, students feel heard, and the fear of "wrong answers" is replaced with open-ended exploration.
- **Slower-paced learning:** Promote a shift away from the rush for the "right" answer, encouraging deep reflection and discovery.

Time required: 30 minutes

Audience intended: 8th-12th grade science or geography students

Group observation instructions

1. [Display the slides included](#) at the front of the classroom. Start with **Slide 1** introducing the activity and the ground rules.

Sample script:

We are going to slow down and take ten minutes or so to observe a map and discuss what we discover and notice about it. There are no right or wrong answers! Let's go over some ground rules.

- *Raise your hand to share your ideas with the class.*
- *All ideas are welcome.*
- *Be respectful of others' ideas!*
- *It's okay if you disagree!*
- *Build off each other's ideas.*

Next, let's take a minute to quietly observe...

2. Display **USGS Carbon Cycle diagram**- Allow students a silent minute to observe and optionally another two minutes to make sense of it on the [student worksheet](#) provided.
3. Display **data** – Allow students a silent minute to observe and optionally another minute to record their observations. Then facilitate Visual Thinking Strategies using the following questions and paraphrasing.
 1. **Q1** – “What is going on in this image?”; after an observation is made, paraphrase and maybe follow up with Q2.
 2. **Q2** – “What do you see that makes you say that?; paraphrase again and to obtain the next observation use Q3.
 3. **Q3** – “What more can we find?”; this is an opening for another student to share an observation.

How to **paraphrase** responses: After each student response, paraphrase what you heard using conditional language (possibly, could be, might, etc.). This ensures all students feel included and heard. Introducing new vocabulary is appropriate here. Most importantly, do not lead students to what you want them to see or reward “right answers.” Allow observations, ideas and discussions to be open, free-flowing, and universally accepted.

Example exchange: Teacher: **Q1:** *What’s going on in this image?* Student: *Red means hot in this map.* Teacher: *Thanks for starting us off. You are commenting on the colors that you see here, in what you are calling a map.* **Q2:** *What do you see that makes you say that?* Student: *I said it’s a map because it is and red means hot because I think those are parts of the ocean that are hotter than other parts.* Teacher: *Okay so this seems to be a map because it looks familiar to you and you also are using background information to state that you believe these areas (pointing to the map) to be hotter than these (pointing to the map) areas. Thank you.* **Q3:** *What more can we find?*

4. This time, we are not doing VTS with the label and legend. We are saving it for a Data Jigsaw activity. Organize students into groups of 3 and follow instructions on the slide and student worksheet.
5. End of **Data Lens** lesson.
6. **Science literacy extension:** Advance the slides to find the link and age-appropriate descriptions for all datasets used. (5 min)

*Contact [VTS](#) to receive training. Training increases fidelity of VTS and improves outcomes.

Video Extension

[Human Activities are impacting the climate system](#) (2:45) – CIRES CEEE

Supplemental Lesson Plans

[Data Puzzle: Not all Warming is Equal](#) – CIRES CEEE

[Right Here Right Now: Solutions Educator Guide](#) – CIRES CEEE

Get SOS Explorer® to increase engagement!

For the best data visualization experience, download NOAA Science on a Sphere's [SOS Explorer®](#). This free software runs on mobile devices including Chromebooks or Windows computers and allows you to visualize data on a virtual globe — [making it a great tool in the K-12+ classroom](#) for increasing data literacy.

The map used in this exercise, [Carbon Dioxide – GEOS-5 Model](#) can be found on NOAA's [SOS Explorer® application](#). When you install SOSx, you'll have the option of choosing this dataset.

*Watch this [video](#) to learn more about how to get real-time data and keep it up to date.

