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: 10-20 minutes
Audience intended: 5th-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 others' ideas.*

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

2. Display **Slide 2** - Allow students a silent minute to observe the map and another minute to record their observations on the student worksheet provided.

3. Continue **Slide 2**: Use the following VTS* questions while paraphrasing responses.
   - ➔ ***Q1*** *– "What is going on in this image?"; after an observation is made, paraphrase and maybe follow up with Q2.*
   - ➔ ***Q2*** *– "What do you see that makes you say that?; paraphrase again and to obtain the next observation use Q3.*
   - ➔ ***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. After a few responses or when observations slow down, display **Slide 3**: Map - with title and colorbar added and repeat step 3.

5. Display **Slide 4**: Two maps that are similar but different. In pairs, have students fill out the Venn Diagram on the student worksheet: *Map A and Map B: How are they different and similar? (add similarities inside the overlapping portion of the circles).* Make sure they understand where to fill out the differences.

6. Finally, they fill out the last prompt on their worksheet: *Using your Venn Diagram, write two questions that scientists might study based on your observations.*

7. **Science Literacy Extension**: Feel free to close by sharing information about the mapped data. Advance the slides to find the link and age-appropriate description for the NOAA Science On a Sphere dataset.

*Contact VTS to receive training. Training increases fidelity of VTS and improves outcomes.

Extensions

Reading: Have the students partner up. Links and directions also on Slides and Student Worksheet.
Student A reads "Scijinks Climate Zones".
Student B reads "How does affect climate and weather on land?"
Summarize what you learned and share with your partner.

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 maps used in this exercise are a snapshot in time. *Land Surface Temperature* and many other data are *updated daily* and are animated on NOAA's SOS Explorer® application. Get it on your mobile device or Windows computer. Then, browse for the "Land Surface Temperature - Real-time" dataset in the app. Be sure you have downloaded all of the images before class.*
*Watch this video to learn more about how to get real-time data and keep it up to date.

Created by: NOAA's Science On a Sphere &
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Inspired by: Building Insights Through Observation Teacher's Toolbox