



# Teaching Common Core in Science

# Who are we?

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# Who are you?

- Name
- School
- Subject(s) you teach
- What you want to get out of this training
- In 15 seconds or less.

# What's our goal here?

- Help you understand the Common Core ELA standards better
- Provide some strategies for incorporating reading, writing, speaking and listening into your science lessons
- Provide some examples of CCSS-aligned lessons
- Help you get launched on designing your own CCSS-aligned unit

# What are your responsibilities?


- Attend these three days
- Attend on Aug 11 (work day)
- Create CCSS-aligned unit (you choose the size) in a team or on your own
- Attend afterschool session in October/  
November and present the unit you create

# Norms of Behavior

- Arrive on time return on time from lunch and breaks.
- Stay engaged and thoughtful all day long.
- Please *disengage* from electronic distractions.
  - Keep laptops, tablets, and phones put away until you need them in the session.
  - This isn't the time to check email or Facebook.
  - Silence your cell phones, put away your Bluetooth earphones.

# Some practical stuff

- This room is where we will be working all three days
- Start at 8:00 promptly
- We are aiming for breaks at about 10:15-10:30, and somewhere near 1:30, but it might not be exactly at that time.
- Lunch is on your own, so bring something or be sprightly about getting lunch and getting back.
- Bathrooms are out the door, upstairs to the left. Take a left down a hall, then a right
- Anything else?



# Navigating Common Core

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# Why is Common Core my business?



You are here.

## But more importantly...

- Under Common Core, literacy is **EVERYBODY's** business.
- Common Core is not the same old same old – it's a different kind of standards.
- Let's take a look at some really interesting stuff buried in the front matter of the standards.



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I started here.

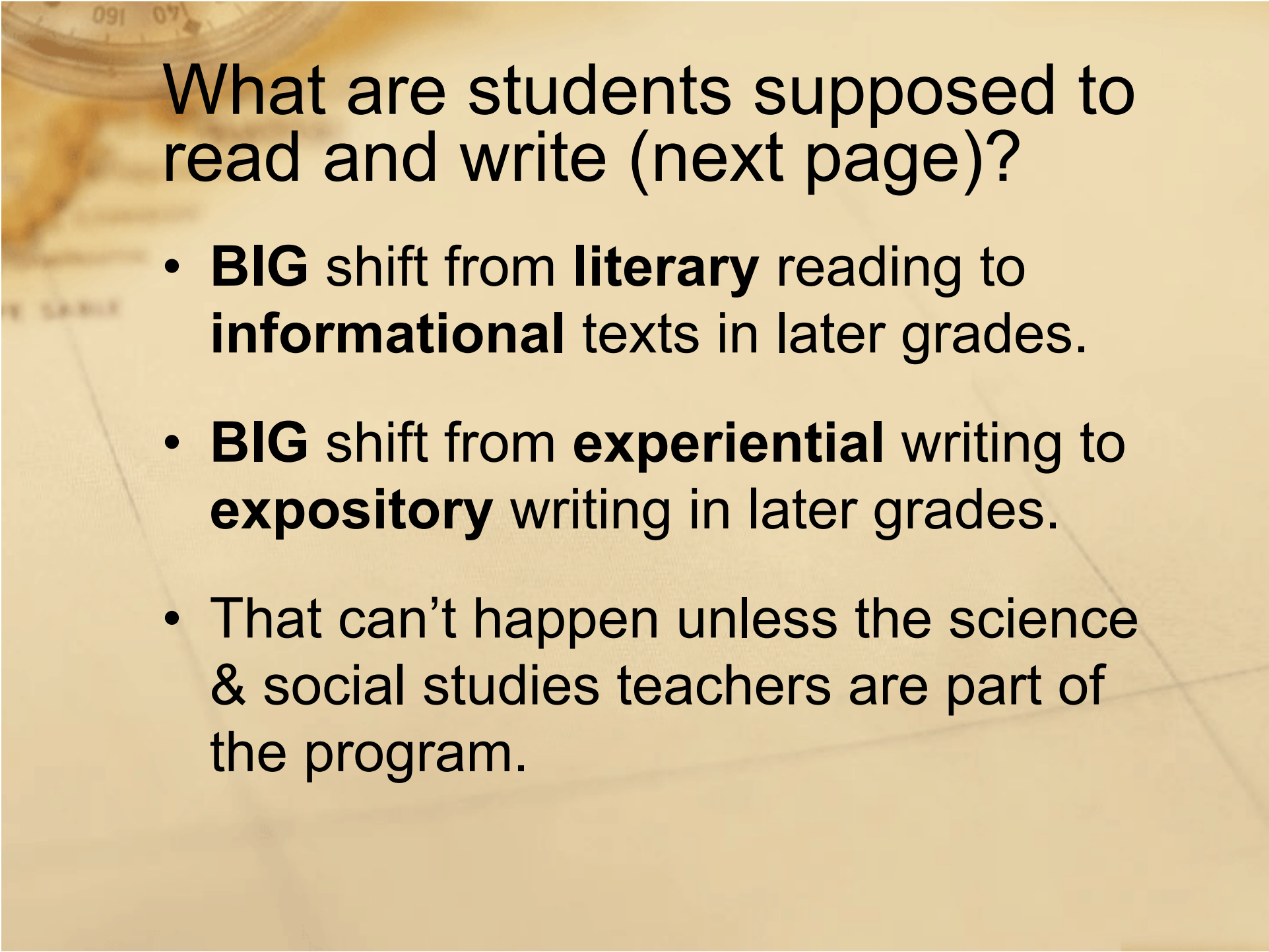




Let's look at a few things together

## **Key Design Considerations:**

- A focus on results rather than means
- An integrated model of literacy
- Shared responsibility for students' literacy development

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What are students supposed to read and write (next page)?

- **BIG** shift from **literary** reading to **informational** texts in later grades.
- **BIG** shift from **experiential** writing to **expository** writing in later grades.
- That can't happen unless the science & social studies teachers are part of the program.

# What is NOT in the standards?

- “The Standards define what all students are expected to know and be able to do, **not how teachers should teach.**”
- “While the Standards focus on what is **most essential**, they do not describe all that can or should be taught.”
- So here’s a new idea – **standards as a floor, not a ceiling**; as guidance, not dictation.

The background of the slide features a faded, sepia-toned image of a map with a compass rose in the upper left corner. The map shows some geographical outlines and a grid of lines. The compass rose has numbers like '091' and '07' visible. The overall tone is warm and historical.

# The **BIGGEST** Common Core shift

- The Common Core is **not** a laundry list of what teachers are supposed to teach.
- (By the way, neither is the Next Generation Science Standards)
- **It is a vision of an educated, literate citizen**, and a map of how to help students achieve that vision.

# So what does an educated, literate citizen look like?

- Next page!
- They demonstrate independence.
- They build strong content knowledge.
- They respond to the varying demands of audience, task, purpose, and discipline.
- They comprehend as well as critique.
- They value evidence.
- They use technology and digital media strategically and capably.
- They come to understand other perspectives and cultures.



# OK, but let's get specific

- Reading
- Writing
- Speaking & Listening standards are not explicitly in the Literacy for Science & Technical Subjects standards, but kids need to have good S&L skills to do science well – so we will also pay attention to them.

# Let's just note a few things about reading

- **Reading requires prior knowledge.** So think about reading as a **follow-up or adjunct** to science activity, not as a lead-in or replacement for science experiences.
- Reading works best as a **social sense-making activity.**
- Reading should be:
  - **Purposeful**
  - **Scaffolded**
  - **Integral to the overall learning experience**

# Let's use a very simple framework for writing:

- **Writing to learn**

- Sense-making, working at higher cognitive levels
- Practicing vocabulary in authentic context
- Emphasis is on the CONTENT, not the form

- **Formal writing**

- Paragraphs to essays to research projects
- A variety of genres
- Emphasis on BOTH content and form
- Offers penalty-free opportunities for revision.

# Structuring formal writing: Communication Triangle

- In the real world, every piece of expository writing has:
  - **Author** with a real-life role
  - **Audience** with a real-life need
  - **Format** for delivering the information
- Think about these kinds of writing and identify the role of the writer, the need of the audience, and the format:
  - Morning newspaper
  - Environmental Impact Report
  - Text message on your phone

# But what about my workload!

- You don't have to grade everything, especially writing to learn assignments
  - Do/don't do assignments
  - Sampled grading – only grade some papers for each assignment
  - Student grading with you auditing
- If you are spending a lot of time marking up papers, you are wasting your time.
  - Research says it doesn't work.
  - It's more effective for students to find their own errors, and only a few kinds at a time – “Fix the four run-on sentences.”



OK, enough handwaving. What does this actually look like?

The background of the slide is a light beige color with a faint, textured pattern. In the top left corner, there is a partial view of a compass rose with numbers like '091' and '07'. Below it, there are some faint, illegible markings that look like a map or technical drawing.

# The set-up

You are the new director of NASA's planetary geology division. One of the fundamental questions in front of you is this:

Are Earth processes happening on other planets? We know the Earth has plate tectonics – that the surface is broken into chunks that move around and do interesting things. Is this true on other planets?

# The mission to Venus

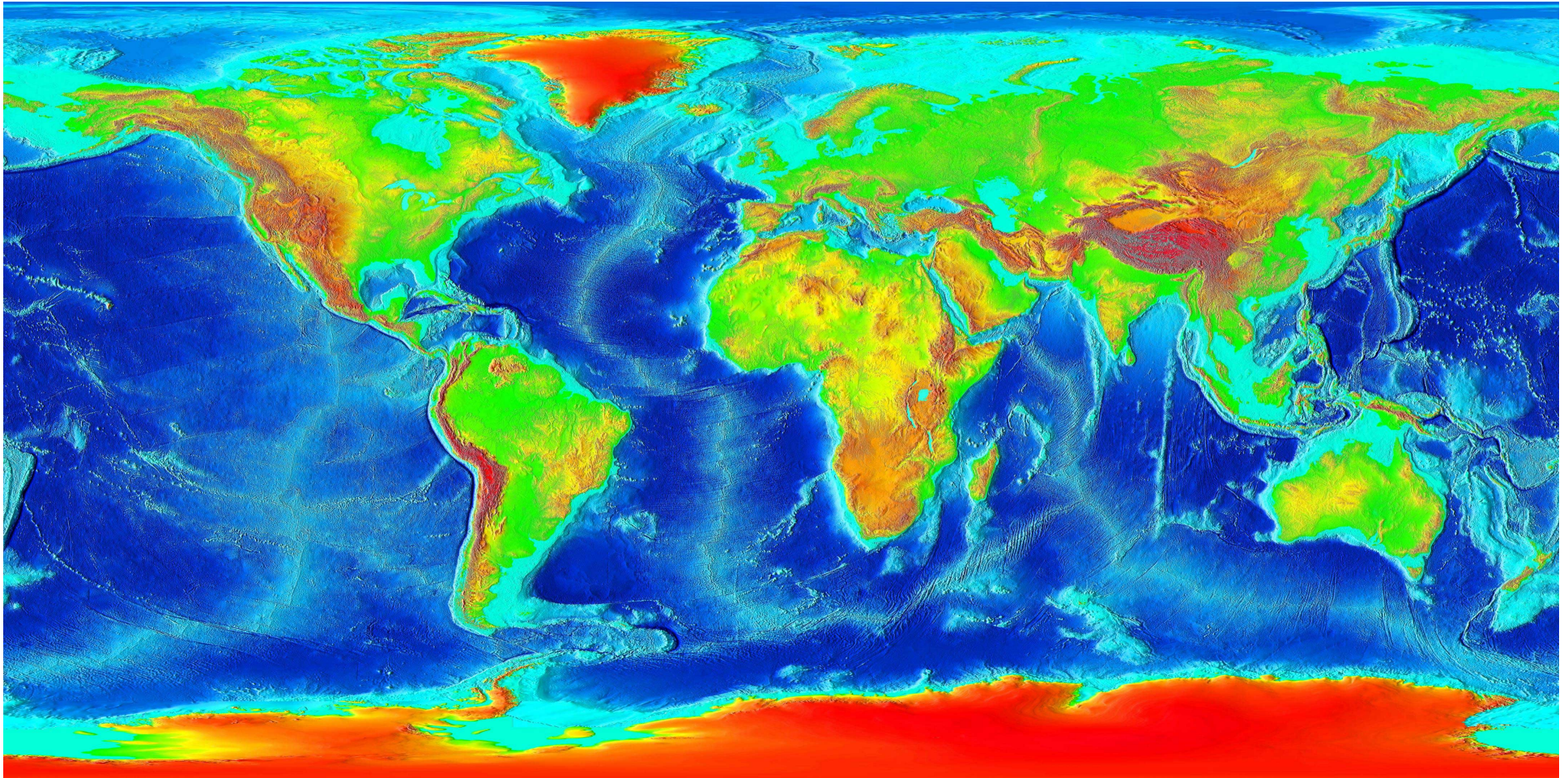
You will be authorizing a mission to Venus in the near future. You will spend billions to send a probe to Venus to collect some data to address this question. Your task is to think about the existing evidence, and then to decide where you want to place the probe to acquire more useful evidence. Then you must make a recommendation to the President.



The background of the slide is a light beige color with a faint, semi-transparent image of a compass and a map. The compass is in the upper left corner, and the map shows some geographical features and lines. The text is overlaid on this background.

# First we have to think about Earth

- Here's a map of the topography of Earth. You have a chart (Plates Graphic Organizer) to help you consider the patterns you see in the topography:
  - Many or few ocean basins?
  - What is the shape of the floor of the ocean basins? Deep in the middle? Deep at the edges?
  - What is the distribution of the mountains on land? Scattered fairly randomly? Organized somehow?



There is no water on this map!  
It shows the topography of the rocky (or icy) surface of the Earth.

Dark blue = low; red = high

The background of the slide features a faint, light-colored image of a globe and a handout titled "Plate Boundaries". The globe shows the outlines of continents and oceans. The handout has a title "Plate Boundaries" and a list of items: "1. Diverging boundaries", "2. Converging boundaries", and "3. Transform boundaries".

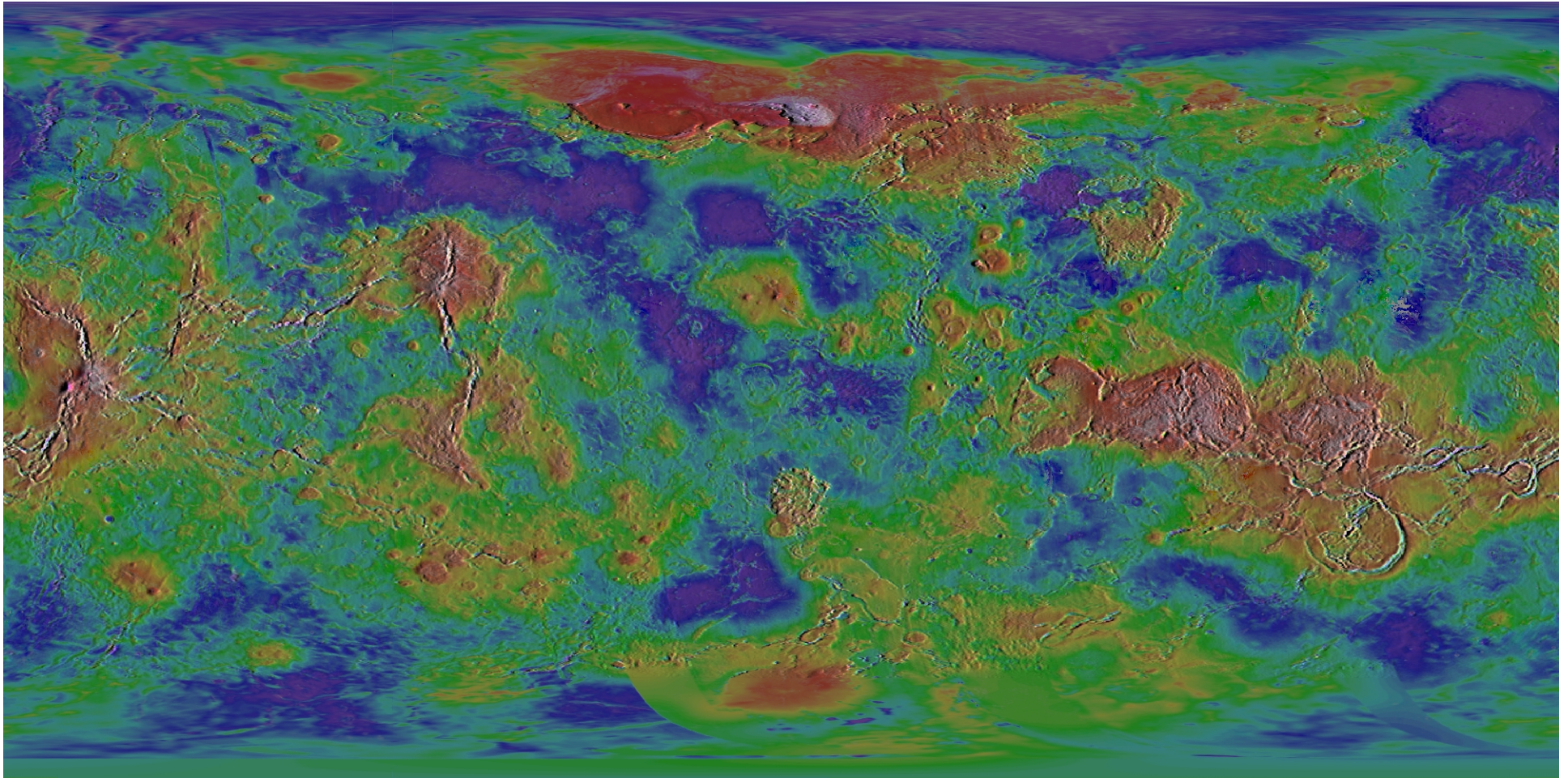
## Now let's relate the patterns to what we know about plate tectonics

- You have a handout called Plate Boundaries.
- Read through #1, diverging boundaries.
- With a partner, figure out if any of the patterns you saw are associated with diverging boundaries
- Record your thinking on your graphic organizer (Relating Earth Patterns to Plate Tectonics).
- Read about converging boundaries, then repeat the partner discussion.

The background of the slide is a light beige color with a faint, textured pattern. In the top-left corner, there is a partial view of a compass rose with numbers like '091' and '07'. The rest of the background appears to be a map or a technical drawing with some lines and text, though it is very faded.

# Time to look at Venus

- Find your patterns chart.
- Same questions as for Earth:
  - Many or few “ocean” basins?
  - What is the shape of the floor of the “ocean” basins? Deep in the middle? Deep at the edges?
  - What is the distribution of the mountains on “land”? Scattered fairly randomly? Organized somehow?



Similar scale as before:  
Dark blue = low, Red (white) = high  
Visible lines are cracks/faults

# Now it's time to decide

- Does Venus have plate tectonics?
- Use the Claim/Explanation/Evidence chart to organize your thinking (Does Venus Have Plate Tectonics?)
- You might have only one or two explanations or lines of evidence for each claim – that's fine. I gave you three places to put your thinking in case you needed that many places.

## Back to your original charge:

- You will be authorizing a mission to Venus in the near future. You will spend billions to send a probe to Venus to collect some data to address this question. Your task is to think about the existing evidence, and then to decide where you want to place the probe to acquire more useful evidence.

# Write a recommendation to the President

- It must include:
- An opinion on whether the evidence says Venus has plate tectonics:
  - Claims and evidence from graphic organizer
- Where you want to place the probe and why
  - What prediction are you testing by placing the probe there?
  - What do you expect to find?



# BTW this models the CCSS assessment

- Smarter Balanced Assessment includes a performance assessment based in either science or social studies
- Performance assessment sets a scenario, asks students to gather information from text and organize, then write a report or take a position.



## ***STUDENT DIRECTIONS***

### **Public Art Argumentative Performance Task**

#### **Issue:**

There has been much debate about the role of government-funded public art. Your local city council is holding a meeting to decide if city funds should be used to finance public art in your town.

Before you attend the meeting, you do some initial research on this topic and uncover four sources (two articles, a website, and an editorial) that provide information about government-funded public art.

After you have reviewed these sources, you will answer some questions about them. Briefly scan the sources and the three questions that follow. Then, go back and read the sources carefully to gain the information you will need to answer the questions and write an argumentative letter.

In Part 2, you will write an argumentative letter on a topic related to the sources.

11<sup>th</sup> grade  
practice ELA  
performance  
assessment

# Take home message

- CCSS are really your friend.
- Remember that reading and writing are sense-making activities, just like reasoning in science.
- We can harness those activities to deepen students' science understanding AND help them be more prepared for the future.

# Getting organized

## 1. Let's get into planning groups.

- High school – subject area
- Middle school – grade level

## 2. What do you want to work on?

- Middle school – focus on the subject areas common across the two possible subject distribution
- High school – maybe a really useful topic
- Both – something you want to invest time in
  - Something that could have some interesting reading
  - Something that has an interesting real world context