



Deep Dive Reading Collective: *The Blue Machine* by Helen Czerski

| Dates | Chapters |
|---|--|
| 3/10 | Chapter 2: The Shape of Seawater Chapter 3: The Anatomy of the Ocean |
| 3/24 | Part Two: Travelling the Blue Machine Chapter 3: Messengers Chapter 4: Passengers |
| 4/7 | Chapter 6: Voyagers Part Three: The Blue Machine and Us Chapter 7: Future |
| Wakelet of Shared Resources | |

WHOLE GROUP

In the chat:

Icebreaker: What was one of the most interesting “supporting” factoids the author has used so far to support the storyline?

Follow-up: do you find these forays into history and storytelling helpful or distracting?

BREAKOUT GROUPS

Discussion Questions for Chapters 2 & 3

#1 COASTS

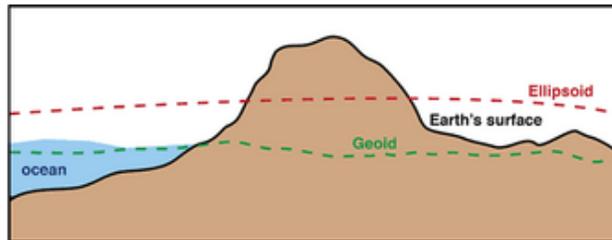
The coasts are the places where the ocean connects with the land and where humans interact with the ocean.

- Discuss how the shape of the ocean can impact where and how people interact with the ocean.
- What are some examples the author used to depict the human and coast connection?
- What are some ways you have interacted with the ocean?

#2 SHAPE

The surface of the ocean is not simply flat, as one might expect, “the ocean surface shape is independent of waves and currents and weather and it’s called the [geoid](#).” (p94)

- What causes the bumpy and irregular shape of the planet’s liquid environment?
- The geoid concept seems like a tough one for students to learn about. How would you teach about the geoid?
- Where does an understanding of the geoid come into play in our world (e.g., can you think of any fields in which understanding the geoid is imperative?)?



#3 SEPARATION AND MIXING

“The balance between [separation and mixing] dictates what happens and where, sculpting the large- and small-scale anatomy of the ocean.” (page 149)

- Discuss the causes and impacts of these two processes on how the ocean functions.
- What are the implications of this for marine ecosystems, climate regulation and nutrient cycles?
- Discuss how [thermohaline circulation](#) (hint: salt, temperature, and density) works and drives the ocean conveyor belt.
- Do you have ideas to share on ways to teach this concept?

#4 POLAR REGIONS

The author states that the polar regions have a net loss of energy while the equatorial regions have a net gain of energy.

- How does ice formation affect the salinity of the water in the polar regions?
- Discuss how these factors add the “fuel” that runs “the blue machine.”

#5 GYRES

There are five major ocean gyres, which are large systems of rotating ocean currents.

- What is the driver behind the location and direction of the major ocean gyres?
- How do the gyres impact ocean life?
- How have gyres influenced human history and current events?

#6 “FIELD WORK”

Towards the end of chapter 3, Czernski notes that doing “field” work at sea involves working “outdoors in all weather conditions, perched on the top of a very mobile fluid with cold hands, minimal equipment, and no access to anything we didn’t bring with us.”

- During your TAS experience, did you witness your crewmates having to adjust the plan because something malfunctioned at sea and they had to fix it OR pivot and be flexible?
- Do you talk to your students about experimental design and limited resources?
- Do you have a favorite moment of ingenuity in your own teaching career you would like to share?