

ACTIVITY: Discover the changes in the ocean from surface to deep.

GRADE LEVEL(S): K to 6th



 30 minutes

OVERVIEW: Discover the physics of the ocean

Plus 20 minutes for journal writing/drawing

DISCIPLINES: Science, physics, math, language arts, visual arts

OBJECTIVES: Students will be able to:

- describe the color changes at different ocean depths
- discuss the changes in light at different ocean depths
- describe the changes in temperature at different ocean depths
- explain the changes in pressure at different ocean depths

MATERIALS: • Box of 64 Crayons per \*cooperative learning group or one per class.

- Copies of the *Color Me Deep* fun sheet (optional)
- Crayons: Specific color crayons needed: Sky blue, Turquoise Blue, Cerulean, Blue, Indigo, Gray, and Black

(OPTIONAL DEEP THOUGHTS JOURNAL PROMPT: IF I DOVE TO THE DEEP, THE COLORS I'D SEE)

WHAT TO DO:

1. Tell students the first part of understanding the deep ocean is understanding the changes and differences from the top to the bottom. Depending on the age of the students you can do this as an entire class or divide into smaller cooperative learning groups. Have each team pour out **all** the crayons.

Teacher's Note: Before you begin, this is also a great time to remind students that part of being a scientist is brainstorming (which leads to a hypothesis). As a team member, they should encourage "outside the box" kind of ideas (rather than evaluate or criticize).

2. Ask, *If you traveled down into the deep sea, how would the ocean change colors on the way?*

Explain students will use the crayons to show the ocean colors they think they'd see on the way to the deep. Each student gets a chance to choose the order and number of crayons from the surface to ocean bottom. The next student adds, removes or reorganizes the crayons in the order they think. Each team member gets a turn. (Allow time for each student to write down their color list, or have a team member do it for them to speed up process. They can also add the list to their *Deep Thoughts Journal*.)

3. After the last student’s turn, have group (or class) look at the crayons they’ve chosen. Without touching the crayons, have them brainstorm possible changes and why. After the group comes to a consensus, allow them to add, move or remove up to 3 crayons.
4. Count the total number of crayons each group has laid out. If time/age appropriate compare color order, create graphs...etc. Find out which, if any group, has guessed correctly.
5. Read from *Jake, the SeaDog’s Journal, Chapter 2b* to discover the changes to the ocean as one dives deeper: **color, light, temperature, and pressure.**
6. Discuss the number of colors kids imagined (chose in crayon form) vs the real number; the causes of color change the deeper into the sea, what they think of this discovery.
7. Have teams reorganize their crayons with the correct colors and order (see list below).

CRAYON COLOR	DEPTH
Sky Blue	110 ft (35 m)
Turquoise Blue	150 ft (50 m)
Cerulean	377 ft (115 m)
Blue	600 to 800 ft (183 to 244 m)
Indigo	800 to 1000 ft (244 to 305 m)
Gray	1,500 ft (457 m)
Black	3,000 ft (1,000 m)



Allow students time to write down (or draw) their thoughts, discoveries, and questions in their *Deep Thoughts Journal*. Be sure to have them add the correct color sequence and compare it to their original thoughts.

GO DEEPER:  $\frac{2}{+3}$  

Graph ocean depth by crayon color either on paper, though older students may prefer drawing their own, younger students may prefer to use the *Color me Deep* fun sheet.

Surround your students with math and science by covering an entire wall with a giant depth color graph. As you explore the deep, students can add drawings of animals or research equipment to really bring the deep to life.

WhaleTimes Color Me Deep Fun Sheet

Depth (in feet)	Color
110	Sky Blue
150	Turquoise Blue
377	Cerulean
600 to 800	Blue
800 to 1000	Indigo
1,500	Gray
3,000	Black

Note: The distance between depths is not to scale!