

Increasing Under-represented High School Students' Ocean Awareness and Knowledge

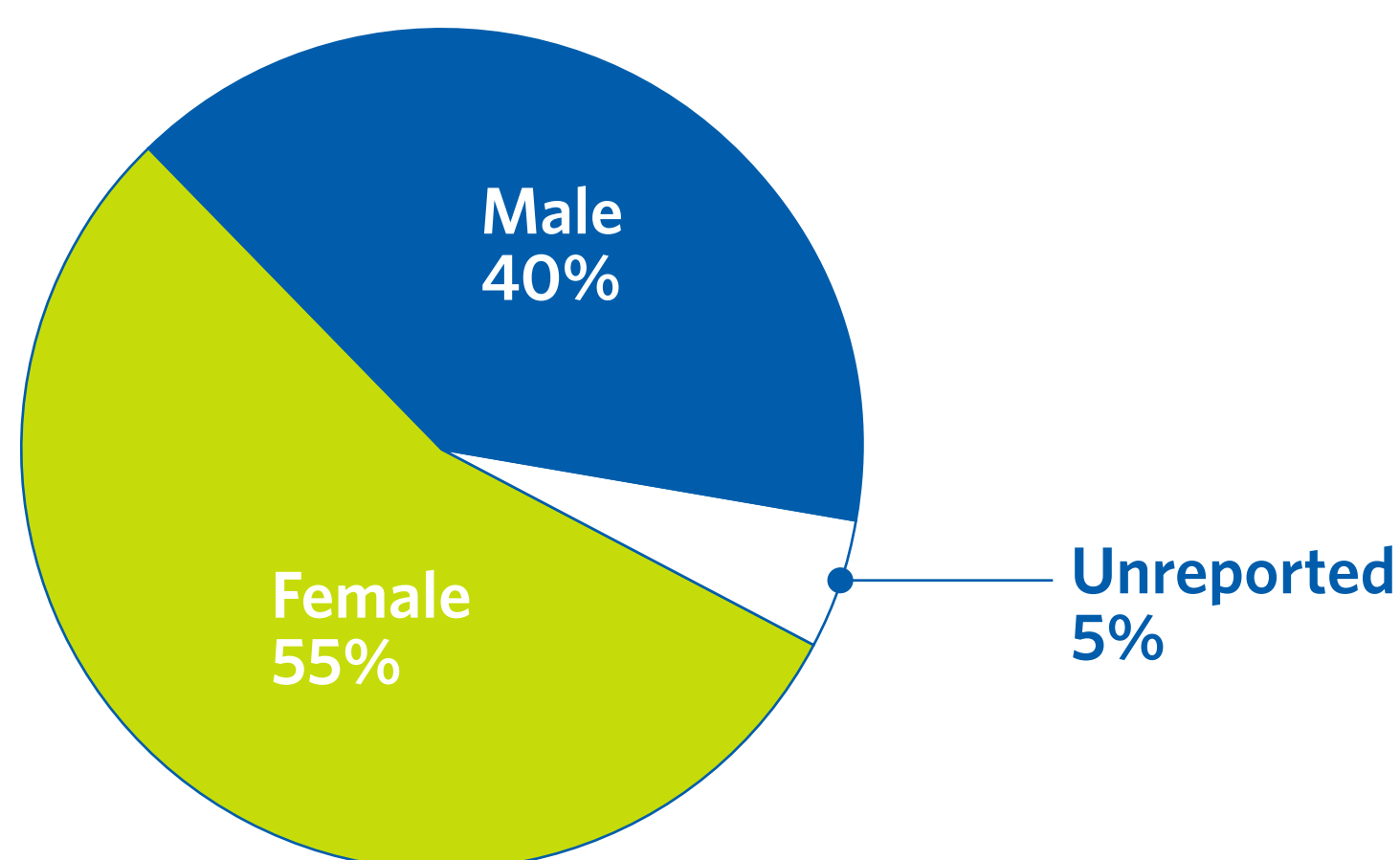
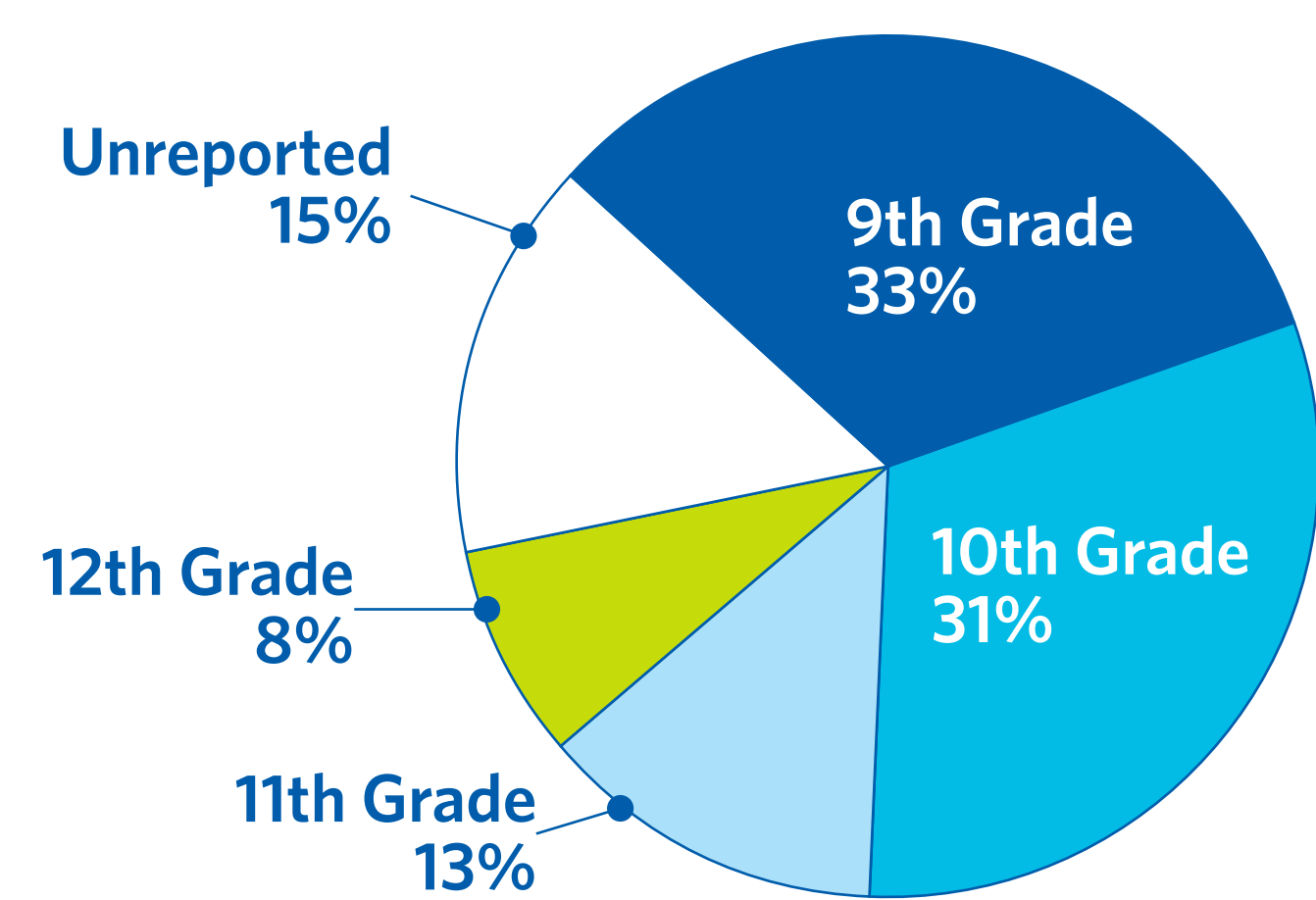
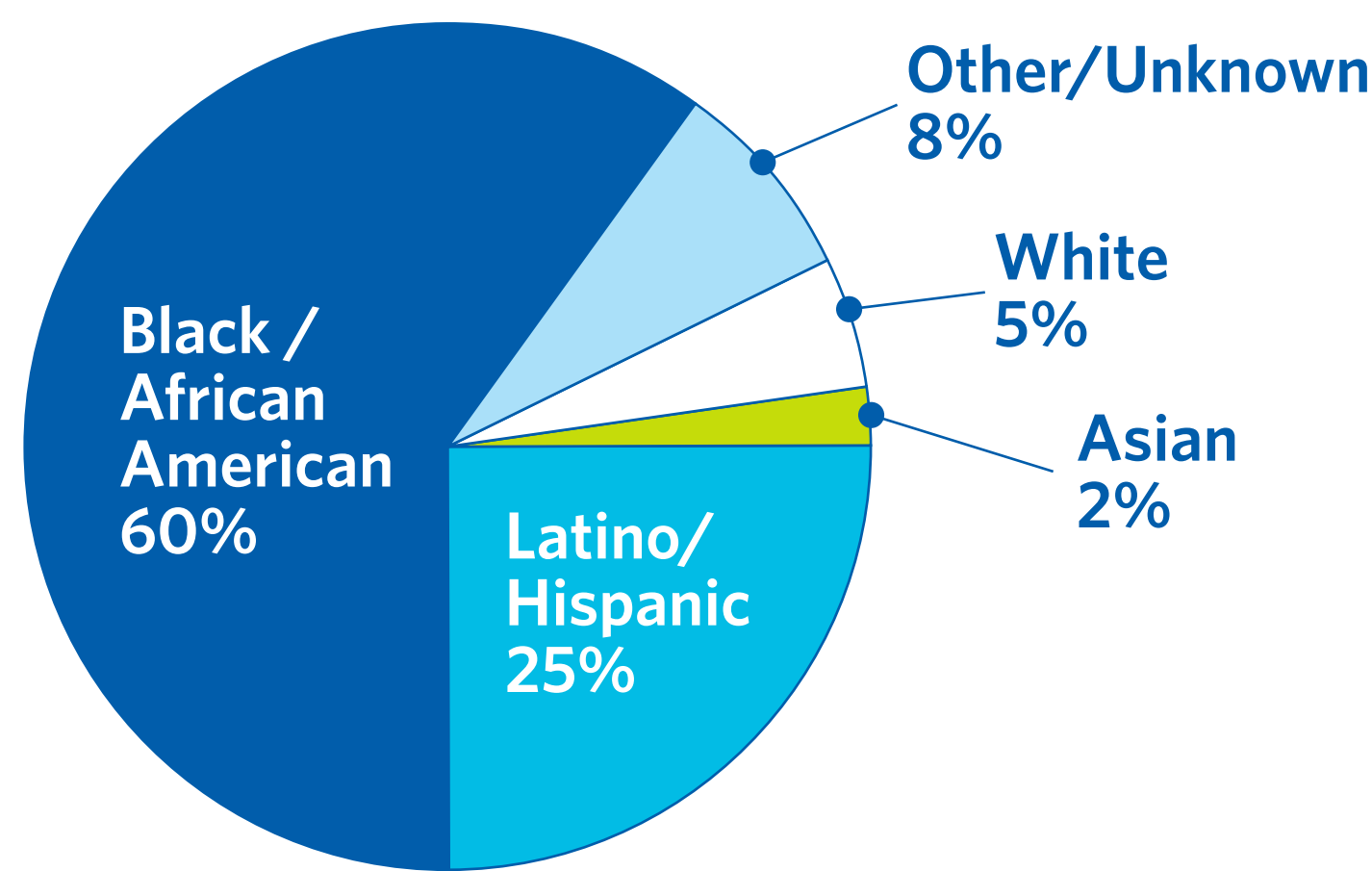
Evaluation Results Katie Gardner; Kate Florio; Harold R. Clark¹; Chris Parsons²; C. Sage Lichtenwalner³

1 Introduction

From December 2010 through June 2011, Liberty Science Center offered a two-day ocean science program to 208 students and their teachers from 10 public high schools in Newark, New Jersey. The program consisted of focused instruction and hands-on activities and labs related to the ocean's physical and chemical characteristics and how these affect biological systems. This program included several data-oriented lessons developed under the Center for Ocean Science Education Excellence-Networked Ocean World (COSEE-NOW) and was intended to increase ocean literacy in students, enhance their ability to interpret and manipulate data, and raise awareness of how ocean scientists do their work.

Key Concepts Included:

- The carbon cycle and biological pump
- Use of ocean observing systems
- Thermohaline circulation



2 Evaluation Methods

We collected evaluation data from students, teachers, and staff educators.

- Students completed surveys at the beginning and end of the program.
- Teachers completed a survey at the end.
- Staff educators recorded their observations of the students and each program.

We are reporting results for the 208 students from whom we received 163 matched pairs of surveys (about 78% of all student participants).



Why do scientists study the ocean?

One student's response

Pre-program

"Scientists think it's important to study the ocean because they need to know about the life in the ocean and what's going on."

Post-program

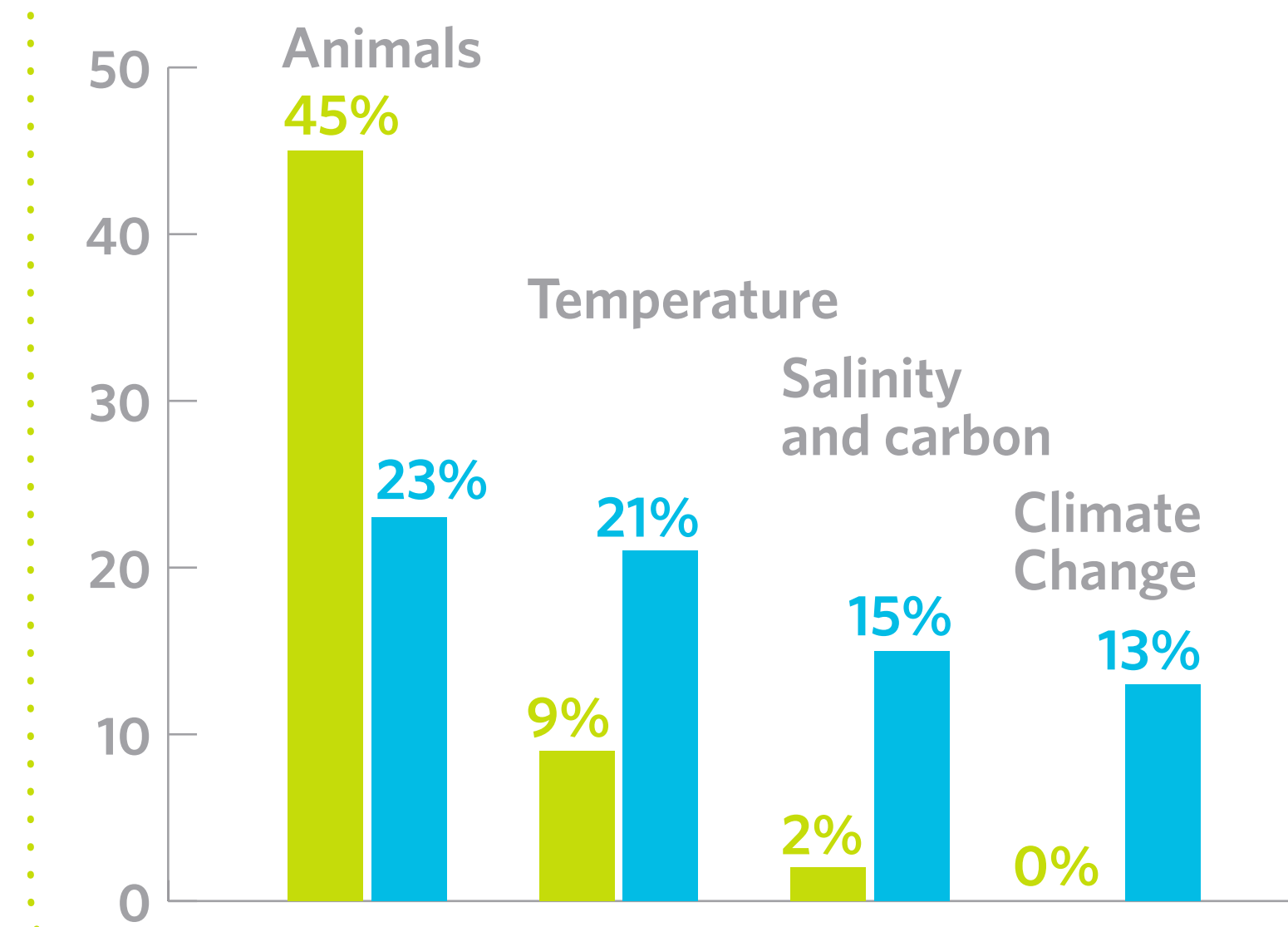
"They think it's important to study the ocean because it affects our temperature, our water system, our food, and for recreational purposes."

3 Results

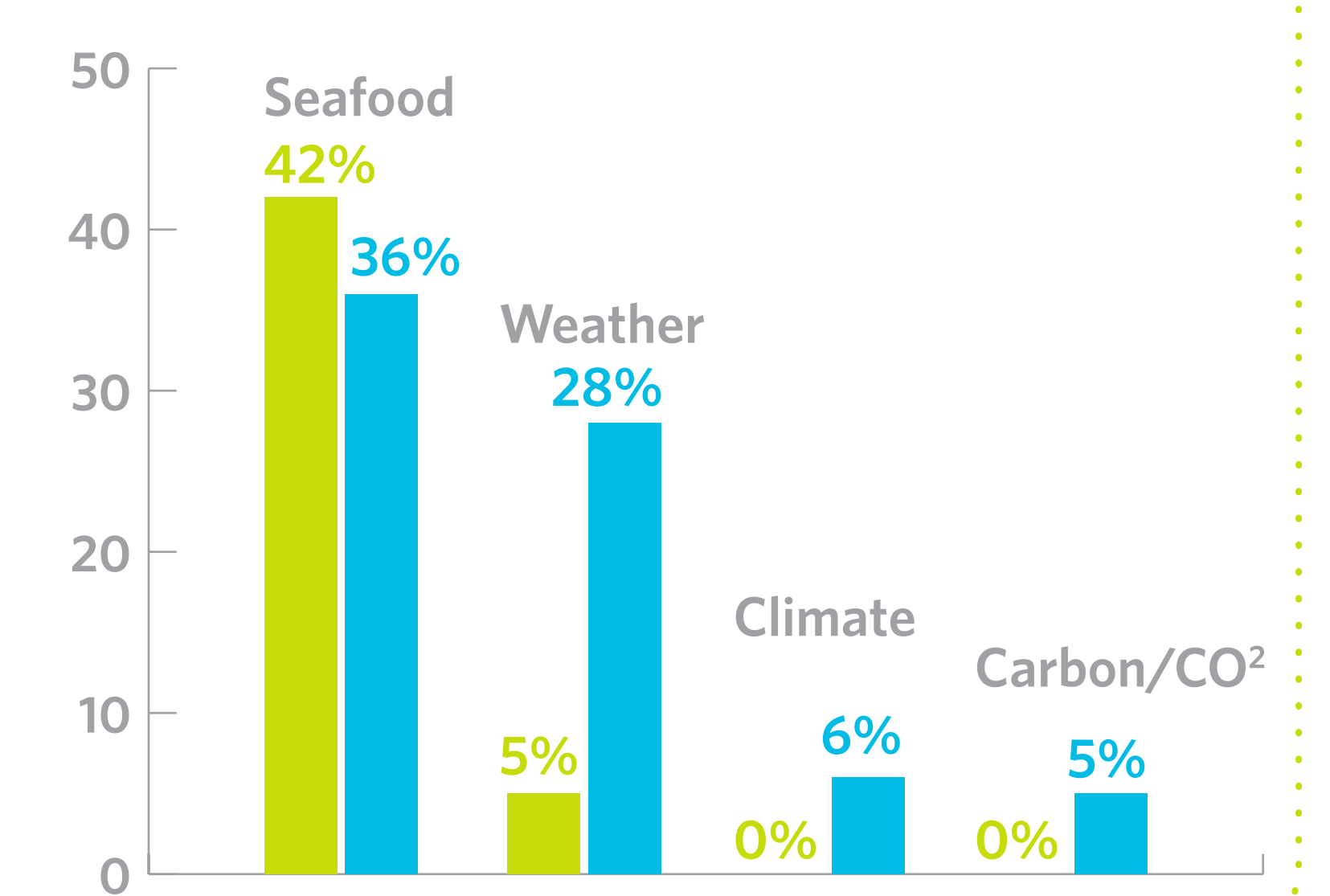
Students' knowledge increases were statistically significant. Their pre-program focus on ocean animals shifted to a post-program focus on the chemical and physical properties of the ocean.

Data Columns ■ Pre-program responses ■ Post-program responses

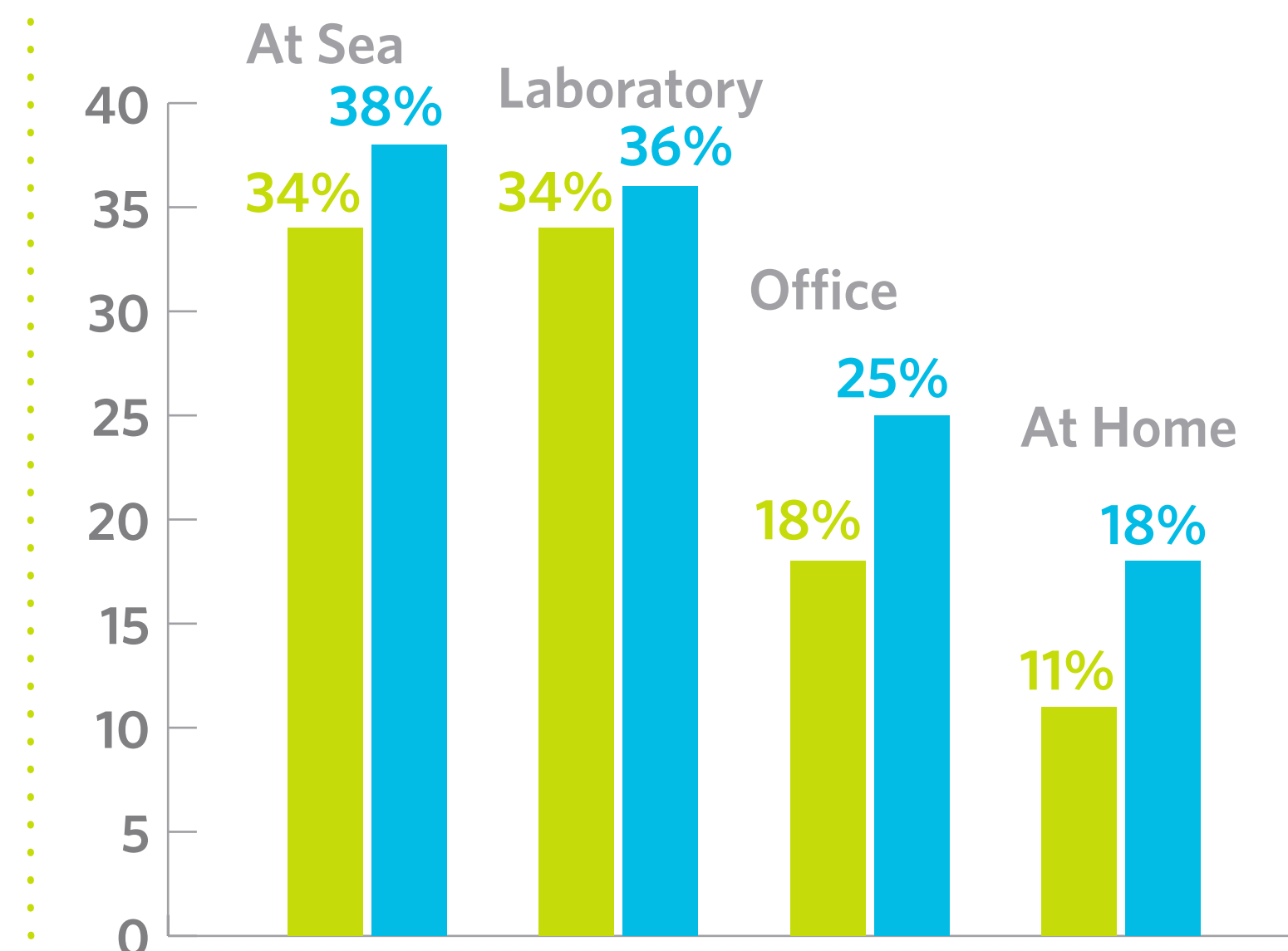
Why do scientists study the ocean? To learn about:



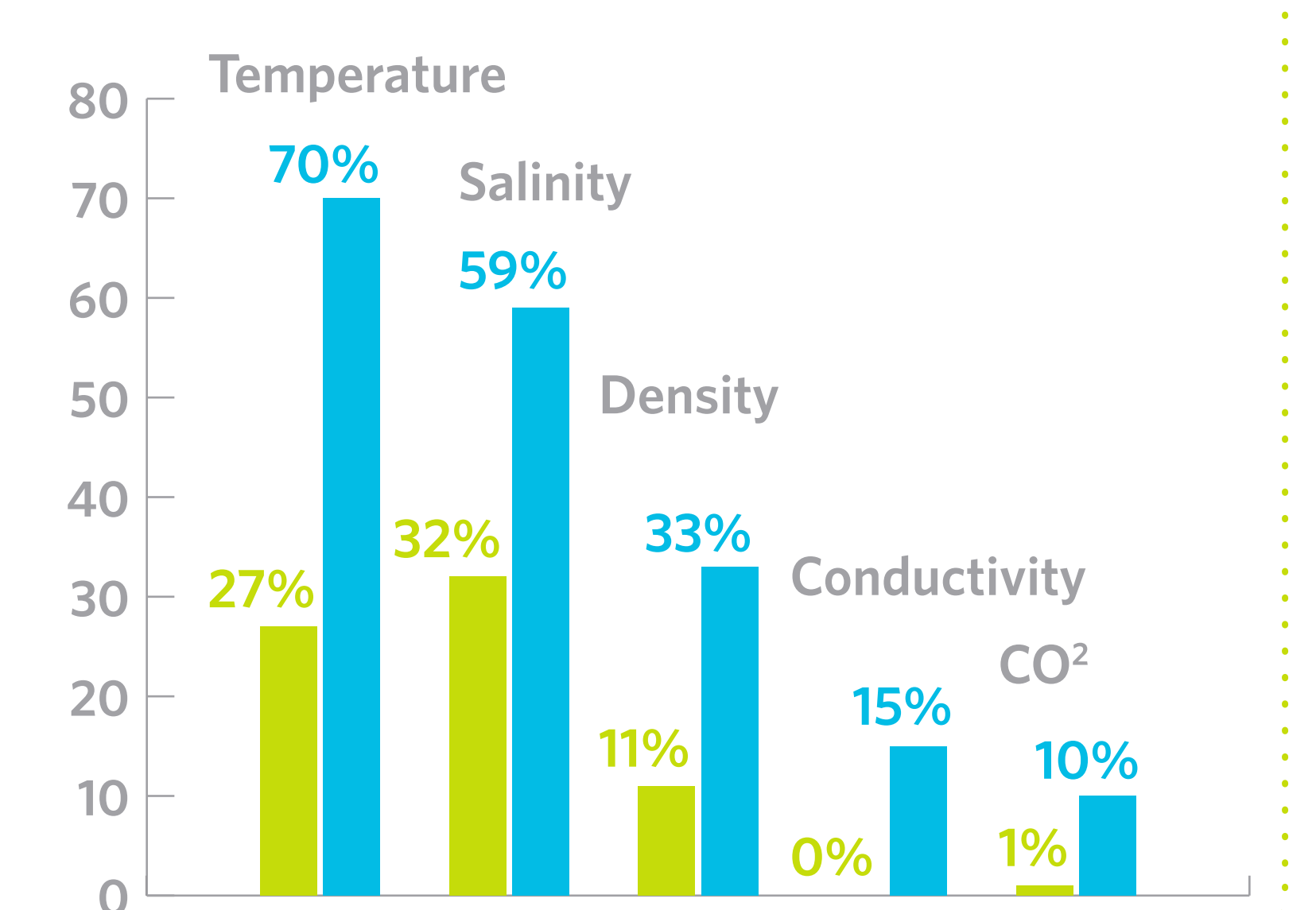
How does the ocean affect your life?



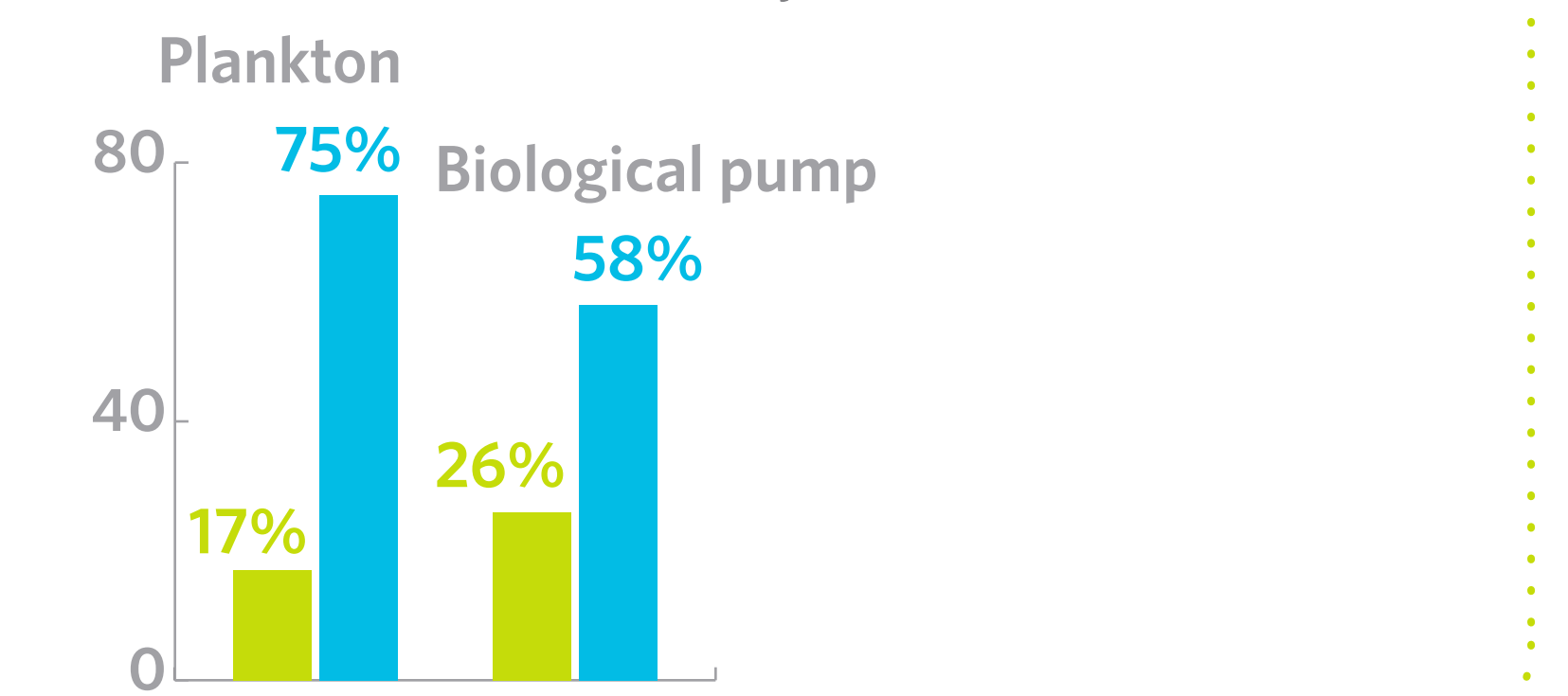
Where do scientists do data collection work?



What are some properties of ocean water that scientists measure?



Multiple Choice definitions Students who correctly defined:



4 Conclusions

Survey results indicate that this program successfully increased students' awareness of and knowledge about the physical and chemical characteristics of the ocean, the ocean's impact on their daily lives, and scientists' ability to do their research remotely. For the 2011-12 school year, the Newark Public School District requested a 400% increase in the number of programs offered to allow more of their students to participate. Based on evaluation results, we restructured the program to include an overarching inquiry-based project, and have trained additional staff to teach this program.