CUTTING EDGE PEER-REVIEWED SCIENCE RESEARCH ADAPTED FOR STUDENTS AND THEIR TEACHERS

# An easy way to introduce students to scientific research concepts:
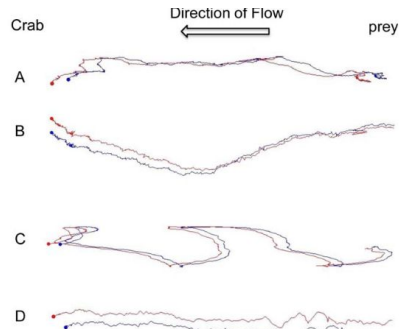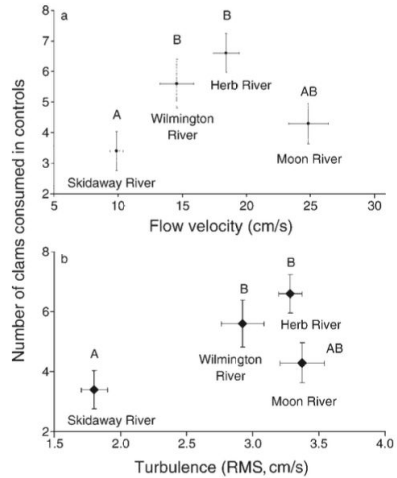# Science Journal for Kids

Dr. Miranda Wilson
Senior Content Managing Editor

# Issues with scientific research - A student perspective



TI = \frac{\sqrt{(u_{rms})^2 + (v_{rms})^2 + (w_{rms})^2}}{\sqrt{u^2 + v^2 + w^2}} \quad (1)

# One solution - a gentle introduction

- Adapted literature
  - Correct reading level
  - Understandable vocabulary
- Real and recent research
- Interesting topics
- Easy for teachers
- Improved understanding of scientific method

**Results:**

We measured a 40% improvement in the sections where teachers used SJK's resources. The results were statistically significant to above 99% confidence interval. (I.e. if there were no difference between control and intervention groups, there would be a less than 1% chance of observing the results we found.)

| | Averaged score (out of 4 possible points) |
|---|---|
| "Intervention" sections | 2.47 |
| "Control" sections | 1.77 |

## IMPACT ASSESSMENT STUDY

### Executive Summary

By Alana Siegner and Tanya Dimitrova,
Energy and Resources Group, University of California Berkeley

# SJK - Our main resource

- **<u>Adapted peer-reviewed primary scientific research papers</u>**
  - Elementary, middle, and high school
  - Arranged like a scientific research paper
- Papers are:
  - Recently published
  - Suggested by student volunteers
  - Generally from high impact journals
- Adaptations are approved by researchers
  - Accurate representation of research

# Adaptations also have:

- Adapted methods and results figures
- Glossary of key terms
- Check Your Understanding questions
- Additional reference suggestions
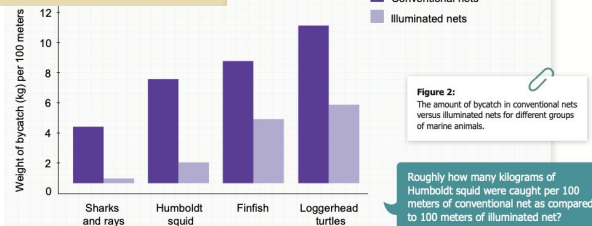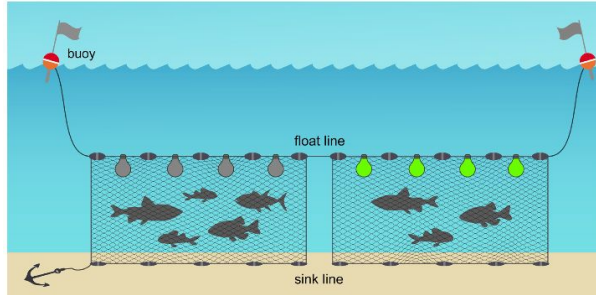
## Glossary of Key Terms

**Bycatch** – marine animals that are caught accidentally in fishing nets. This includes dolphins, sea turtles, sharks, rays, and seabirds. Often these species are already threatened or endangered, with fishing usually being the biggest threat they face.

**Commercial fishing** – catching fish for profit. This can be small scale (like gillnet fishing) or large scale.

**Fishers** – traditionally people that work in fishing have been called fishermen. But it's not always men that fish! So, "fishers" is now the best way to talk about people who work in fishing.

**Gillnet** – a wall of netting that hangs in the water. The net is usually made of nylon. It's designed so that the fish get their gills stuck in the net and cannot escape. Gillnets usually target fish like salmon, halibut, grouper, cod, haddock, herring, and seabass.

**Selective** – limiting how much is taken or chosen. In fishing, it describes how much bycatch a type of fishing tends to have. Gillnets are not selective because they have high bycatch. Pole-and-line fishing is more selective because they usually catch only target fish.

**Sustainable** – able to be maintained long-term. Generally, the more selective a type of fishing is, the more sustainable it is. At the moment, most fishing is not sustainable – we are catching too many target fish, as well as bycatch.

**Target species, target catch** – the type of fish that the fishers are trying to catch so they can sell it (for example, at a fish market).

## Check your understanding

1. Why is telling people to stop eating fish not a solution? What about telling fishers to stop using gillnets?

2. How did we design our experiment to make sure that it was controlled?

3. How many target fish and bycatch species were caught in total during our experiment?

4. Why is reducing bycatch a win not just for marine life but also for fishers?

5. What are the most sustainable species of fish to eat in your country?

## REFERENCES

Jesse F. Senko, S. Hoyt Peckham, Daniel Aguilar-Ramirez, and John H. Wang (2022) *Net illumination reduces fisheries bycatch, maintains catch value, and increases operational efficiency.* Current Biology.
https://www.sciencedirect.com/science/article/abs/pii/S0960982221017371

Marine Stewardship Council: Fishing methods and gear types
https://www.msc.org/en-us/what-we-are-doing/our-approach/fishing-methods-gear-types

National Oceanic and Atmospheric Administration: Fisheries and seafood
https://www.noaa.gov/education/resource-collections/marine-life/fisheries-and-seafood

# Example

[Fisheries Adaptation](Fisheries Adaptation)

# SJK - Additional Resources

- Audio versions of articles (video and podcast forms available)
- Blackboard versions of articles (SJK Academy)
- Videos to introduce paper topics
- Additional activity/lab suggestions
    - Created by SJK educators
    - Curated from reputable educational partners



SCIENCE JOURNAL for KIDS PODCAST
AUDIO EDITION

SJK Academy

SCIENCE JOURNAL for KIDS and TEENS

**Teaching Activity: Analyzing and Interpreting Data**
Based on:
**How can we make sure to catch only the fish we want to eat?**

**Introduction:**
Fishing provides nourishment for a large number of people around the world and fisheries can get depleted if we don't take care of them. This article and this activity explore data investigating more sustainable fishing techniques to make sure that we don't run out of fish to eat!

About   Worksheets   Pretrained   Stories   Book   Help   Log In
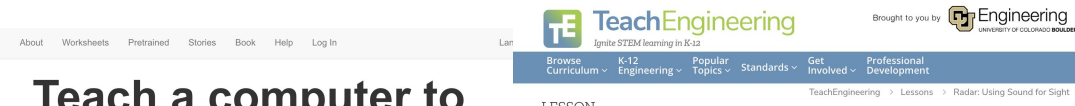
**Teach a computer to play a game**

Get started    Learn more

1    Collect examples of things you want to be able to recognise

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LESSON
**Radar: Using Sound for Sight**

**Quick Look**

Waves

GRADE LEVEL:    6 (4 – 6)

LESSONS IN THIS UNIT:    1  2

TIME REQUIRED:    1 hour

# More additional resources

- Lesson idea videos
- Ask a Scientist videos (questions from students)
- Podcasts
  - Lesson ideas - geared toward middle school
  - Ask-a-Scientist (long form interviews with researchers)
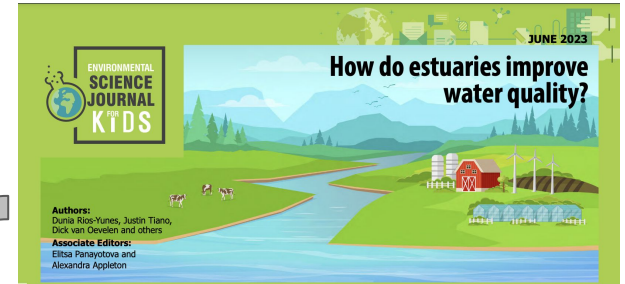- Translations of adaptations (19 languages)
- Collections

# Website Tour

https://www.sciencejournalforkids.org/

# Suggestions on how to use SJK resources
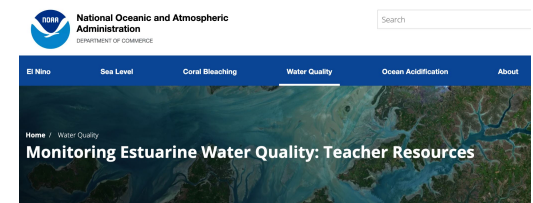
- Younger Students:
  - Pair adaptations with activities
    - In or outside the classroom
  - Create their own glossary to learn scientific vocab
  - Create their own results graph based on the text

- Older Students:
  - Pair adaptations with activities
  - Pair adaptations with original articles
  - Have students write their own adaptations
  - Have students replicate methodologies
    - Use both adaptations and original articles for reference



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ENVIRONMENTAL SCIENCE JOURNAL FOR KIDS

How do estuaries improve water quality?

Authors:
Dunia Rios-Yunes, Justin Tiano, Dick van Oevelen and others

Associate Editors:
Elitsa Panayotova and Alexandra Appleton



Pexels.com
Ben Libby



National Oceanic and Atmospheric Administration
DEPARTMENT OF COMMERCE

El Nino    Sea Level    Coral Bleaching    Water Quality    Ocean Acidification    About

Home / Water Quality

Monitoring Estuarine Water Quality: Teacher Resources

Interested in engaging your students with real-time NOAA data? In this module, designed for grades 6-8, students engage with an interactive graphing tool to explore parameters such as nutrients, temperature, salinity, pH, dissolved oxygen, and in some cases, contaminants. Students are guided through the use of these data to

# Questions

My contact information:

Dr. Miranda Wilson - miranda@sciencejournalforkids.org