


 The logo for Science 3D features the word "SCIENCE" in a bold, black, sans-serif font. To the right of "SCIENCE" is a stylized "3D" where the "3" and "D" are in a larger, bold, black font. Three small blue dots are arranged vertically to the left of the "3", and two small blue dots are arranged horizontally between the "3" and the "D".
 

# SCIENCE 3D

## CALIFORNIA WHITE SHARK

### SCIENCE PERFORMANCE EXPECTATIONS AND DISCIPLINARY CORE IDEAS

In this Elementary School Mission (NGSS Grade 3), students will address the general topics below. For a complete list of NGSS standards covered in each segment of the mission, continue reading after the general standards. *Note: Be sure to complete the **Mission Reader** and **Mission Research** before viewing the full **Mission Video**. Explore [How to Use Science 3D](#) to get suggestions on how to pace the mission and options for the order of activities. Math and Language Arts standards will be added shortly.*

- In the **Mission Reader**, *California White Shark*, students will learn about fossils and what they tell us about ancient organisms and environments. They will investigate life cycles, structure and function, and how living in groups can benefit animals. They will also explore renewable and non-renewable resources and how people can both hurt and help the environment. Finally, they will learn about how scientists study white sharks.
- During **Mission Research**, students will explore life cycles and fossils. They will interpret fossils to determine if the organisms they see were terrestrial or aquatic. Then, students will decide if fossil evidence supports claims that paleontologists have found a Megalodon nursery. For the life cycle activity, students will draw life cycles of several California animals using evidence from their **Mission Reader**.
- In the **Science Mission**, students will explore how white shark populations might change and how humans can affect animal populations. They will develop hypothesis and use data to test them. Then, they will explore shark motion and distances traveled over time. Finally, they will explore how white sharks respond to different factors in their environment by generating and testing hypotheses about what might influence numbers of baby white sharks in different habitats.
- In the **STEM Project**, students will investigate technology in their own lives and how technology is used in the Shark Lab's research. Then, they will design solutions to proposed technological challenges. Finally, they will use their graphing and math skills to plan how to find the Shark Lab's autonomous submarine, *Ecomapper*, if it gets lost.
- The **Explore Your Backyard** activity has students investigate the plants and animals in a local environment. They will record whether they are common or rare and explore how human and natural changes influence the environment and the types and numbers of organisms.

#### SCIENCE/ENGINEERING AND DESIGN DISCIPLINARY CORE IDEAS AND PERFORMANCE EXPECTATIONS

##### MISSION READER

3-LS1-1	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth reproduction, and death.
LS1.B	Growth and development of organisms.
3-LS1-2	Construct an argument that some animals form groups that help members survive.
3-LS4-1	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
LS4.A	Evidence of common ancestry and diversity.
3-LS4-3	Construct an argument with evidence in a particular habitat some organism can survive well, some can survive less well, and some cannot survive at all.
LS4.C	Adaptation.
3-LS4-4	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there might change.
LS4.D	Biodiversity and humans.
PS4.C	Information technologies and Instrumentation.

##### MISSION RESEARCH

3-LS1-1	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth reproduction, and death.
LS1.B	Growth and development of organisms.
3-LS4-1	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
LS4.A	Evidence of common ancestry and diversity.
LS4.C	Adaptation.

## SCIENCE MISSION

- 3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there might change.
- LS4.D Biodiversity and humans.
- 3-PS2-2 Make observations +/- measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
- PS2.A Forces and motion: patterns can be observed and measured.

## STEM PROJECT

- 3-PS2-2 Make observations +/- measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
- PS2.A Forces and motion: patterns can be observed and measured.
- 3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- ETS1.A Defining and delimiting engineering problems.
- 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- ETS1.B Developing possible solutions: communicating with peers about proposed solutions is important and can improve design.

## EXPLORE YOUR BACKYARD

- 3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there might change.
- LS4.D Biodiversity and humans.

## CROSS CUTTING CONCEPTS

- Patterns: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Cause and effect - mechanisms and predictions: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Scale, proportion and quantity: [Mission Research](#), [Science Mission](#)
- System and system models: [Mission Research](#), [STEM Project](#)
- Energy and matter: [Reader](#)
- Structure and function: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Stability and change: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

## CONNECTION TO ENGINEERING, TECHNOLOGY AND APPLICATIONS OF SCIENCE

- Interdependence of science, engineering and technology: [Reader](#), [Science Mission](#), [STEM Project](#)
- Influence of science, engineering and technology on society and the natural world: [Reader](#), [STEM Project](#), [Explore Your Backyard](#)

## CONNECTION TO NATURE OF SCIENCE

- Scientific investigations use a variety of methods: [Reader](#), [Science Mission](#), [STEM Project](#)
- Scientific knowledge is based on empirical evidence: [Mission Research](#), [Science Mission](#)
- Scientific knowledge is open to revision in light of new evidence: [Mission Research](#), [Science Mission](#), [Explore Your Backyard](#)
- Science models, laws, mechanisms and theories explain natural phenomena: [Mission Research](#), [Science Mission](#), [Explore Your Backyard](#)
- Science is a way of knowing: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Scientific knowledge assumes an order and consistency in natural systems: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Science is a human endeavor: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Science addresses questions about the natural and material world: [Reader](#), [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)

## SCIENCE AND ENGINEERING PRACTICES

- Asking questions and defining: [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Developing and using models: [STEM Project](#)
- Planning and carrying out investigations: [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Analyzing and interpreting data: [Mission Research](#), [Science Mission](#), [STEM Project](#)
- Using mathematics and computational thinking: [Science Mission](#), [STEM Project](#)
- Constructing explanations and designing solutions: [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Engaging in argument from evidence: [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)
- Obtaining, evaluating and communicating information: [Mission Research](#), [Science Mission](#), [STEM Project](#), [Explore Your Backyard](#)