greater cleveland aquarium

NEMO

TEACHER PLANNING GUIDE

2022 - 2023

OH! LOTTERY

CLEVELAND METROPOLITAN SCHOOL DISTRICT

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SPONSORED BY

OH! LOTTERY

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Welcome to NEMO 2022 - 2023

The NEMO program is a sponsored 4th grade trip to the Greater Cleveland Aquarium. This trip is free to 4th grade students and includes transportation. This visit supports the 4th grade science curriculum and can be reinforced by the pre and post visit lessons found in this guide.

Typical NEMO Timeline

- **9:30** • Bus pick up at your school
- **10:00** • Arrive at the Aquarium
  - Classroom introduction
  - Guided Aquarium Tour
  - Lunch - If brought from school
  - Revisit the Aquarium in small chaperone led groups
- **12:30** • Depart the Aquarium
- **1:00** • Bus drops off at your school

BOOKING YOUR TRIP & BEFORE YOU VISIT

Book your trip:

Aquarium education programs are limited to 45 people. If your school has a larger group, we can work with you to split the trip over multiple days. 1 chaperone is required for every 10 students. The Aquarium team will schedule the bus.

Email **education@greaterclevelandaquarium.com** or call **216.862.8803 x7715**.

Have these details ready:

- Preferred date & alternate date
- Estimated number of students
- Estimated number of chaperones
- Any changes needed to the timeline of the day
- Any interest in gift shop options
- Any accommodations needed for bussing

Before you visit:

- Request lunches from your school
- Assign students and chaperones to tour groups
  - Up to 15 people per tour group. Groups of 15-30 will be split into 2 tour groups, groups of 30-45 will be split into 3 tour groups
- Go over student and chaperone expectations
- Optional pre-visit lessons

Day of visit:

- Review student and chaperones expectations
- Designate one person to check in with the education team member upon arrival. Please have an accurate head count of students and chaperones
- Bring the following items
  - Student permission slips and/or emergency contact information
  - Tour Group Roster
  - Lunches

NEMO

TOUR GROUP ROSTER

Group 1
Teacher/Chaperone(s)

_____

_____

Students

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____

Group 2
Teacher/Chaperone(s)

_____

_____

Students

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____

Group 3
Teacher/Chaperone(s)

_____

_____

Students

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____

STUDENT EXPECTATIONS

Be safe:

- Stay with your chaperone
- Please walk while inside
- Please view exhibits safely, without climbing or swinging on exhibit ropes and structures.
- Follow all instructions given by teachers and Aquarium team members.

Respect other guests:

- Please be patient and kind; take turns to view exhibits and use step stools.
- Remember to use your indoor voice.
- Keep your hands to yourself.

Respect the animals:

- Respect animal habitats. Do not push, tap or pound on exhibits.
- Please turn off the flash when taking photos.
- When permitted, please touch animals safely.
  - Only touch animals if instructed by the Aquarium team.
  - Please use two fingers
  - Touch gently, and only where instructed.
  - When at the stingray touch pool, only submerge your hand wrist deep.

Have fun!

CHAPERONE EXPECTATIONS

A ratio of 1 chaperone for every 10 students is required.

- Know which students are in your group and take frequent headcounts.
- Stay with your students.
- Understand the Student Expectations. You are responsible for the behavior of students in your group.
- You are responsible for student safety. In case of emergency (missing student, injured student, etc.), it is your responsibility to notify an Aquarium team member immediately.
- Take an active role in the students' learning experience.
  - Help focus students on tour guide and Aquarium activities.
  - Be engaged in programming; students will follow your lead.
  - Encourage students to slow down and observe.
  - Ask questions to provoke thought and positive learning.
- If you are unable to answer a question, or are unsure of Aquarium policy, please ask our Aquarium team. We are happy to assist.

Thank you! We appreciate your help!

CONNECTION TO STANDARDS

Connection to Ohio Learning Standards

These activities extend the Aquarium field experience and enhance the following Ohio Standards in Science:

Fourth Grade Life Science
Topic: Earth's Living History

4.LS.1: Changes in an organism's environment are sometimes beneficial to its survival and sometimes harmful.

Content Concepts:

- An animal's patterns of behavior are related to the environment. This includes the kinds and numbers of other organisms present, the availability of food and resources, and the physical attributes of the environment.
- Ecosystems are based on interrelationships among and between biotic and abiotic factors.

The NEMO lessons incorporate these content concepts and build on the study of habitats, and adaptations.

Fourth Grade Earth and Space Science
Topic: Earth's Surface

4.ESS.1: Earth's surface has specific characteristics and landforms that can be identified.

Current Topics

- About 70 percent of Earth's surface is covered with water and most of that is the ocean.
- Only a small portion of Earth's water is freshwater, which is found in rivers, lakes and groundwater.

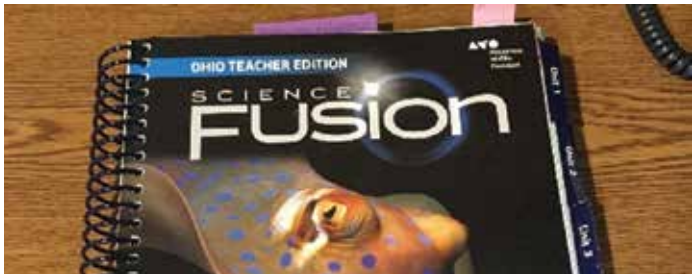
Fourth Grade: Science Inquiry and Application

- Observe and ask questions about the natural environment
- Plan and conduct simple investigations
- Employ simple equipment and tools to gather data and extend the senses
- Communicate about observations, investigations, and explanations
- Review and ask questions about the observations and explanations of others

Science inquiry and investigation skills are utilized throughout the NEMO experience. All lessons and activities are designed with these skills in mind.

Connection to Science Fusion

NEMO lessons correlate to Unit 4 of Ohio Science Fusion textbook: Living Things and their Environments (available in Science Fusion Grade 4 Ohio Teacher Edition on pages 165 to 210).



Specific connections to the Science Fusion textbook appear through the NEMO curriculum guide using the following format:

Science Fusion Connection: page 170-179

**Page numbers refer to Teacher Edition.*

Lesson 1: Habitat Investigation

In the habitat investigation, students explore several aquatic habitats and discover the biotic and abiotic factors that make each unique.

Review the term habitat and have students brainstorm habitats with which they are familiar. Did they include any aquatic habitats? If not, prompt them to extend the list. What makes one habitat different from another? Different habitats contain different living and non-living factors.

Use the NEMO Pre-visit Lessons PowerPoint (available on the Aquarium website).

This PowerPoint provides an overview of rivers & lakes, coral reefs and the open ocean. Using pictures, maps and brief descriptions, the PowerPoint introduces the habitats and summarizes a few characteristics of the fish that live in each.

After viewing the PowerPoint, review the difference between living factors and non-living factors. For each of the three habitats listed on the Habitat Investigation sheet (available on page A3), ask students to circle the living factors, box the non-living factors and cross out factors not found. (Answer key available on page A4).

Which habitats contain freshwater? Which habitats contain saltwater? Is there a factor unique to a coral reef? Students can work in small groups to discuss similarities and differences of each habitat.

Science Fusion Connection: page 168

Lesson 2: Aquatic Animal Adaptations

The body shapes, tail shapes, behavioral adaptations and camouflage listed on the Aquatic Animal Adaptations sheets (pages A1 & A2) will be referenced heavily during the program.

Use the NEMO Pre-visit lesson power point to practice identifying these adaptations. It will walk you through a body shape, tail shape, behavioral adaptation, and camouflage.

Do fish living in the same habitat have similar adaptations? Could a fish from the open ocean survive in a coral reef? Could a fish from rivers and lakes survive in the open ocean? Have students revisit the list of living and non-living factors in the habitats to explain why or why not.

Science Fusion Connection: page 170 - 179 & page 182A

NEMO

AQUATIC ANIMAL ADAPTATIONS

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Body Shapes

Flat
sandy bottom

Torpedo
open water

Boxy
around coral, rocks or other shelter

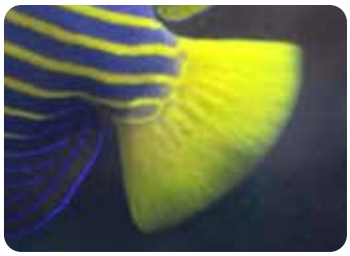
Noodle
hides

Tall and Skinny
tight places

Tail Shapes

Forked
fast

Wedge
sprints



Rounded
slow

Uneven
energy saving

Other Physical Adaptations

Webbed Feet
swimming

Suction Cups
grabbing

Barbels
whiskers

Teeth
biting

Behavioral Adaptations

Schooling
safety in numbers

Ambush Predator
sit and wait

Using Shelter
hiding

Camouflage

Stripes
blend in

Disguise
mimic items in environment

Countershading
darker on top, lighter on bottom

Spots
blend in

Defense Mechanisms

Poison
you eat it

Venom
it stings you

Spikes
sharp

Spines
sharp

HABITAT INVESTIGATION

For each habitat listed below:

- Draw a **circle** around the **living factors** found in that habitat.
- Draw a **box** around the **non-living** factors found in that habitat.
- **Cross out** the factors that are **not found** in that habitat.

Rivers & Lakes

Freshwater	Temperature	Logs
Saltwater	Rocks	Sand
Fish	Frogs	Sunlight
Plants	Pollution	Eels
Sharks	Sea Stars	Algae
Turtles	Plankton	Mud

Coral Reefs

Freshwater	Temperature	Logs
Saltwater	Rocks	Sand
Fish	Frogs	Sunlight
Plants	Pollution	Eels
Sharks	Sea Stars	Algae
Turtles	Plankton	Mud

Open Ocean

Freshwater	Temperature	Logs
Saltwater	Rocks	Sand
Fish	Frogs	Sunlight
Plants	Pollution	Eels
Sharks	Sea Stars	Algae
Turtles	Plankton	Mud

HABITAT INVESTIGATION ANSWER KEY

For each habitat listed below:

- Draw a **circle** around the **living factors** found in that habitat.
- Draw a **box** around the **non-living** factors found in that habitat.
- **Cross out** the factors that are **not found** in that habitat.

Rivers & Lakes

Freshwater	Temperature	Logs
~~Saltwater~~	Rocks	Sand
Fish	Frogs	Sunlight
Plants	Pollution	~~Eels~~
~~Sharks~~	~~Sea Stars~~	Algae
Turtles	Plankton	Mud

Coral Reefs

~~Freshwater~~	Temperature	~~Logs~~
Saltwater	Rocks	Sand
Fish	~~Frogs~~	Sunlight
Plants	Pollution	Eels
Sharks	Sea Stars	Algae
Turtles	Plankton	~~Mud~~

Open Ocean

~~Freshwater~~	Temperature	~~Logs~~
Saltwater	~~Rocks~~	~~Sand~~
Fish	~~Frogs~~	Sunlight
~~Plants~~	Pollution	~~Eels~~
Sharks	~~Sea Stars~~	Algae
Turtles	Plankton	~~Mud~~