



Something Fishy

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Lesson Overview [Edit](#)

Title: Something Fishy
Author: Paula Jewell
Subject: Science
Grade Level(s): 6–8
Duration: three weeks

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Unit Description [Edit](#)

As part of their life science study, students in grade 7 focus on systems and cycles using their understanding of biological functions and connections and relationships in natural systems. Specifically, in this unit, students explore the structures and processes in organism systems that support and propagate life, as well as the impact of scarcity and abundance in ecosystem dynamics. Activities include Something Fishy which explores the impact of temperature on respiration rate and color of a community of fish housed in a freshwater aquarium, as well as a population fluctuation simulation (Gizmo), animal "overpopulation" debate, Survival Tricks adaptations project, the Refugee PBL project, and owl pellet dissection lab.

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State Standards [Edit](#)

7.MS-LS1-4. Construct an explanation based on evidence for how characteristic animal behaviors and specialized plant structures increase the probability of successful reproduction of animals and plants.

7.MS-LS2-1. Analyze and interpret data to provide evidence for the effects of periods of abundant and scarce resources on the growth of organisms and the size of populations in an ecosystem.

MA-ELA-RCA-SC 10. Independently and proficiently read and comprehend science/technical texts exhibiting complexity appropriate for 7th grade science.

MA-ELA-WCA 10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

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Goals

Unit Goals: [Edit](#)

Students will understand that all living and nonliving parts of ecosystems are related and interdependent.

Students will understand that changes within ecosystems cause periods of scarcity and abundance and that certain behaviors and structures support and propagate life.

Students will understand how to describe changes in ecosystems and impacts on organisms using the claims, evidence, and reasoning model both verbally and in writing.



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Lesson Goals: [Edit](#)

Students will:

- be participatory, collaborative partners;
- accurately identify fish species and their basic biological description and needs;
- use scientific thinking to generate testable questions, design experiments, gather data, analyze results, make conclusions, and generate lab reports;
- will describe changes observed in the aquarium using specific qualitative and quantitative evidence;
- connect conclusions reached to probability of survival and successful reproduction of animals.
- include, in conclusions, a discussion about global changes in water temperature due to global warming with potential impacts to ecosystems.
- relate their findings to the effects of periods of abundant and scarce resources on the growth of organisms and the size of populations in an ecosystem.

Lesson Description for Day [Edit](#)

This series of lessons will occur over the course of three weeks. The first week will emphasize general knowledge of freshwater fish, scientific method, and initial data gathering. The second two weeks will include continued data gathering while other aspects of this unit progress.

During Something Fishy, individual students will:

- use written and digital information to learn about several species of freshwater aquarium fish, such as Catfish, Corys, Danios, Gouramis, Guppies, Loaches, Mollies, and Platies, including identification, distribution, habits, etc.

Working together with a partner, students will:

- create a testable question about the impact of temperature on color and respiration rate on particular species of freshwater fish.
- design an experiment to generate evidence to support or disprove their hypotheses;
- gather data by counting respiration rate per minute and using quantitative description of color of individual fish; and,
- create a data keeping system to gather baseline data as well as data changes during study.

Over the course of their study, student partners will gather qualitative and quantitative data related to changes they observe when tank temperatures are increased by 5 degrees using a tank heater. Each temperature change will go into effect for one week to give enough time to create observable changes. There will likely be two increases of 5 degrees included in the study. This data gathering will occur while other aspects of the ecosystem unit progress.

At the end of this study, student partners will generate a lab report, as well as class data to be shared in public formats such as a podcast, web-site, etc.

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Methods

Anticipatory Set: [Edit](#)

Students will complete the Create-A-Fish Activity (in approximately 50 minutes), in which they use dice to randomly select characteristics such as biome, defenses, body style, sensory systems, and feeding types to create a fish.

To be successful, students need to think about how each adaptation allows their new creation to live in its habitat and fit into a food chain. They will, as a group, create a mini-poster that includes a drawing of the biome, the fish (may be a sculpture), and description of the new fish based on its biome, adaptations, and characteristics.

This kick-off activity will both serve as a hook for the series of lessons, that connects previous concepts, as well as a pre-assessment about student knowledge of fish adaptations, and fish, as a class.

Introduce and Model New Knowledge: [Edit](#)

Previously taught material includes claims, evidence, and reasoning model (CER), the scientific method including developing testable questions and hypotheses, qualitative and quantitative data collection, interpreting results and writing conclusions and basic needs of organisms and how adaptations help meet those needs. Those concepts will be retaught through bellringer warm-up activities, mini-lessons and other similar methods as needed.

New knowledge includes 1) identifying and describing the needs of the specific freshwater fish species in the aquarium, 2) counting respiration rate in fish, and 3) relating survival and propagation with environmental pressures such as increasing temperature.

To unpack the new knowledge about fish species, students will complete a station activity where each fish species is featured at each station. Each partnership will, with another partnership, visit each station for approximately 5 minutes to complete a graphic organizer in their science notebooks about each fish species. The teacher will model how to create the science notebook entry using a Think Aloud. To differentiate and provide student choice, sentence starters for the organizer will be provided, and each station will include materials of two reading levels, as well as a video.

To learn how to count respiration rate, the teacher will show this video: https://www.youtube.com/watch?v=XEIRlw5rCUk&disable_polymer=true stopping to reiterate certain aspects. The teacher will then hand out specific directions for counting respiration, and use the document camera on the mini-aquarium in the classroom housing the Betta fish, and using the Think Aloud strategy will demonstrate counting respiration rate.

To discuss environmental pressures, students will complete a web-quest including sites such as the climate hot map <https://www.climatehotmap.org/global-warming-effects/lakes-and-rivers.html>, climate central <https://www.climatecentral.org/news/in-hot-water-warming-waters-are-stressing-fish-and-the-fishing-industry-2019>, and ClimeFish's case studies: <https://climefish.eu/climate-change-and-impacts-on-lakes-and-ponds/>



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Provide Guided Practice: [Edit](#)

There are several areas during this series of lessons that the teacher will provide facilitation and "guide from the side" while students work independently with their partners including when they develop their testable question and hypothesis, choose their fish species and plan, develop their data keeping strategy, gather data, interpret their results, and begin their conclusions. In addition, students will complete peer editing with their classmates using PeerGrade (free online platform).

Provide Independent Practice: [Edit](#)

There are several areas during this series of lessons that students work independently with their partners. For example, students draft their own testable question and hypotheses, choose their fish species and plan, develop their data keeping strategy, gather data, interpret their results, and write their conclusions. Students will also work independently publishing their results in a pod-cast, web-site, or other digital tool of their choosing.

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Wrap-Up [Edit](#)

This series of lessons will conclude with sharing published results (such as podcasts, web-sites, etc.) through a Gallery Walk or similar strategy. Students will also have a broad in-class discussion of their thinking about increasing temperatures of freshwater systems and the impact on fish species and broader ecosystems, as well as provide feedback to the teacher about the lesson series.

Assessment

Formative/Ongoing Assessment: [Edit](#)

Students will be informally assessed using:

- partnership and collaboration using the attached collaboration rubric
- Create-a-Fish kick-off activity
- science notebooks (Something Fishy station activity, testable question, hypothesis, data keeping, analysis, draft conclusion)
- warm up activities (Bellringers, Plickers, Quick Writes)
- on time and complete homework (preparation for day's activities)
- lab protocol (safety, respect, etc.)
- use of class time/need for redirection
- web-quest (completion and accuracy)

Summative/End Of Lesson Assessment: [Edit](#)

- Lab report including conclusions (see rubric)
- Published product (pod-cast, web-site, etc.) (see rubric)
- Gallery Walk or other sharing strategy (see rubric)



Materials

ADD A NEW RESOURCE

Web Sites

- Create a podcast rubric

[Edit](#) | [Delete](#)

http://rubistar.4teachers.org/index.php?screen=ShowRubric&rubric_id=2467322&

Video & Audio Resources

- Climate Central

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<https://www.climatecentral.org/news/in-hot-water-warming-waters-are-stressing-fish-and-the-fishing-industry-2019>

- Climate Hot Map

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<https://www.climatehotmap.org/global-warming-effects/lakes-and-rivers.html>

- ClimeFish

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<https://climefish.eu/climate-change-and-impacts-on-lakes-and-ponds/>

- Counting Fish Respiration

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<https://www.youtube.com/watch?v=XEIRlw5rCUk>

Other Resources

- Collaboration Rubric

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http://www.readwritethink.org/files/resources/30860_rubric.pdf

- Create a Fish

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<https://1drv.ms/w/s!Altn6qEkEFGDjXPsPnov0N6evxLe>

- Lab Report Rubric

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<https://1drv.ms/w/s!Altn6qEkEFGDjXXJCGlfrGMtDfwn>

- Website Rubric

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http://rubistar.4teachers.org/index.php?screen=PrintRubricDownloadFile&rubric_id=2804823&
