

LESSON 1 Hawai'i's Shoreline Habitats

Lesson at a Glance

Students use music to move about the room and share with other children what they know about Hawaiian shoreline habitats. They record their ideas about these habitats and learn new science vocabulary words to express their ideas. A K-W-L chart may be used instead of milling around the room with music.

Lesson Duration

Two 45-minute periods

Essential Question(s)

What are the different Hawaiian shoreline habitats?
How are Hawaiian shoreline organisms adapted to survive in their harsh environments?

Key Concepts

- Plants and animals of the various shoreline environments found in Hawai'i have developed special traits that allow them to survive in the harsh shoreline environments.
- Animals depend on the plants along the shoreline and near shoreline areas, such as seaweeds and marsh grasses, for oxygen and protection.

Instructional Objectives

- I can describe the structures of organisms in the Hawaiian shoreline environments and how they help the organisms survive.
- I can explain how the shoreline organisms have developed special features so that they can live in the harsh shoreline environments.
- I can ask questions, share ideas, and thoughts before, during, and after the slide show presentation.

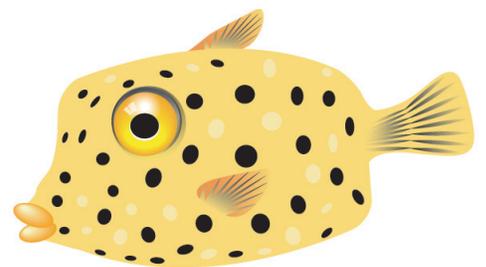
Related HCPSIII Benchmark(s):

Science SC.3.4.1
Compare distinct structures of living things that help them to survive.

Science SC.3.5.1
Describe the relationship between structure and function in organisms.

Language Arts LA.3.1.3
Use new grade-appropriate vocabulary, including homophones and homographs, introduced in stories, informational texts, word study, and reading.

Language Arts LA.3.6.1
Use oral language to obtain information, complete a task, and share ideas and personal opinions with others.



Assessment Tools

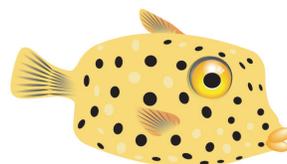
Benchmark Rubric:

Topic	Cells, Tissues, Organs, and Organ Systems		
Benchmark SC.3.4.1	Compare distinct structures of living things that help them to survive		
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Group living things by the distinct structures that help them to survive and provide justification for the grouping	Compare distinct structures of living things that help them to survive	Describe a few ways in which distinct structures of living things help them to survive	Name distinct structures of living things that help them to survive

Topic	Unity and Diversity		
Benchmark SC.3.5.1	Describe the relationship between structure and function in organisms		
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Classify the structures of organisms according to their function	Describe the relationship between structure and function in organisms	Identify the relationship between structure and function in an organism	Recall that structures in organisms are related to the functions they perform

Topic	Vocabulary and Concept Development		
Benchmark LA.3.1.3	Use new grade-appropriate vocabulary, including homophones and homographs, introduced in stories, informational texts, word study, and reading		
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Use new grade-appropriate vocabulary, including homophones and homographs, with precision, fluency, and accuracy	Use new grade-appropriate vocabulary, including homophones and homographs, with no significant errors	Use new grade-appropriate vocabulary, including homophones and homographs, with difficulty and a few significant and/or many minor errors	Use new grade-appropriate vocabulary, including homophones and homographs, with great difficulty and/or many significant errors

Topic	Discussion and Presentation		
Benchmark LA.3.6.1	Use oral language to obtain information, complete a task, and share ideas and personal opinions with others		
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Use creative oral language to obtain information, complete a task, and share ideas and personal opinions with others, in a highly effective way	Use oral language to obtain information, complete a task, and share ideas and personal opinions with others	Use typical oral language that sometimes aids in obtaining information, completing a task, or sharing ideas and personal opinions with others	Use inappropriate oral language that does not aid in obtaining information, completing a task, or sharing ideas and personal opinions with others



Assessment/Evidence Pieces

This lesson serves as an introduction and is not for assessment. Some formative assessments may be made using the following:

Lesson

- Class discussion on Milling to Music activity and 2 charts
- Class discussion of PowerPoint
- Class drawings of a shoreline habitat

Materials Needed

Teacher	Class	Group	Student
<ul style="list-style-type: none"> • CD player • CD music (e.g. Little Mermaid © Disney Music, <i>Under the Sea</i> or other children's music) • 3 pieces – Chart paper • 4 markers (different colors, if possible) • Method to present PowerPoint 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Optional: sticky notes or scratch pieces of paper • Optional: Tape

Instructional Resources

PowerPoint Presentation: *Shoreline Habitats*

Teacher Reading: *Milling to Music Chart Discussion Guide*

Student Worksheet: *Hawaiian Shoreline Habitats Puzzle*

Teacher Answer Key: *Hawaiian Shoreline Habitats Puzzle*

Assessment Tool: *Teacher Resource Checklist*

Student Vocabulary Words

adaptation: a feature of an organism that develops over time and allows it to survive in its environment.

brackish water: water that is partly fresh and partly salty.

community: all the plants and animals that live in the same area and interact with one another.

ecosystem: a community of different living organisms and the physical environment in which they are found and interact with.

endemic species: a naturally occurring species that lives in a particular area and is found no where else in the world.



estuary: a partly enclosed bay where salty ocean water is mixed with freshwater from rivers or streams.

habitat: the environment in which an organism naturally lives and grows.

intertidal zone the area between low- and high-tide marks and alternately covered by water and exposed to air during each tidal cycle.

infauna: organisms that live within the sand.

marine: related to the ocean or sea as opposed to the land.

native species: species that occur naturally in an area.

organism: an individual living system, for example, an animal, plant, bacteria or fungus.

salinity: the amount of salts dissolved in a liquid, such as water in a lake, river, bay or ocean.

species: a group of related organisms having some common characteristics or qualities, distinct from other organisms.

terrestrial: related to the land or earth, as opposed to a fresh water, or marine habitat.

Lesson Plan

Lesson Preparation

- Review the Science Background provided in the Unit Overview and the Teacher Reading *Milling to Music Chart Discussion Guide*.
- Preview PowerPoint Presentation *Shoreline Habitats* and make arrangements to project it.
- Make copies of Student Worksheet *Hawaiian Shoreline Habitats Puzzle*, one per student.
- Choose and obtain a soundtrack to use for the *Milling to Music*.
- Plan where to set up CD player, and how to make space in the classroom for students to move about.
- Prepare two pieces of chart paper, labeled as follows:
(Leave room on each chart to record student responses)
 - Chart 1: What are some plants and animals we may see at a beach or shoreline area?
 - Chart 2: How do they protect themselves from the elements and how do they protect themselves from other animals?"
- OPTIONAL: Teacher Resource Checklist may be used to monitor students

I. Shoreline Habitats of Hawai'i: Presentation and Discussion

- Present the *Shoreline Habitats* PowerPoint, and engage students in describing and interpreting the images. Help students identify, and if possible, name plants and animals, and distinguish wetlands from beach environments.
- Explain that “*exposure to the elements*” is often used to describe collectively such natural conditions as the sun, heat (or cold), wind, and salt. Then ask students to describe how the plants and animals in the images are affected by the elements that they are exposed to, and what they do to protect themselves from these elements.



- C. Anticipate that students are more familiar with shoreline habitats than with the wetland habitats. Explain how the wetlands function to hold water, both run-off from rainfall on the mountains, as well as seawater moved in and out by the tides. Identify the kinds of plants and animals that live there, some permanently, others seeking temporary refuge, and yet others that live there only as juveniles. Introduce terms to describe the habitat by putting up a word wall. As an optional activity, students can make flash cards using their own definitions and adding a picture, if appropriate.
- D. Similarly, review the types of shoreline habitats typically found in Hawai‘i.
- E. If students are already familiar with the Hawaiian *Abupua‘a* system as a way of managing the resources from the mountaintop to the ocean, connect discussions of habitats with their understanding of traditional practices. (The *Abupua‘a* system is discussed in Unit 4, so you may choose to wait until then to make these connections.)

II. Milling to Music

[Suggestion: a K-W-L chart may be used instead of the Milling to Music activity.]

- A. Begin the lesson by engaging students in moving to music, and sharing prior knowledge about the Hawaiian shoreline organisms and habitats.
- B. Explain to students that when the music starts they will move SAFELY around the room, and when the music stops they will find the person closest to them and share what they know about the question provided. After 1 minute of sharing, begin the music again, and have children mingle until the music stops and they find another partner. *NOTE: Students may share in partners or triads. Provide a “lost & found” with you for students who are shy and cannot find a partner.*
- C. Stop the music, and post Chart 1. Read Question 1 aloud: “*What are some plants and animals we may see at a beach or shoreline area?*” Allow students approximately 1 minute to discuss their answers with their new partner. Then restart the music and continue the *Milling to Music* activity.
[Optional: Teacher may want to have students jot their ideas down on a sticky note or scratch piece of paper. Students can hold onto these papers until the class discussion and then attach them to the proper chart.]
- D. Stop the music a second time, and post Chart 2. Read Question 2 aloud: “*How do they protect themselves from the elements and how do they protect themselves from other animals?*” Allow approximately 1 minute for students to discuss their answers with their new partner.
[Optional: Teacher may want to have students jot their ideas down on a sticky note or scratch piece of paper. Students can hold onto these papers until the class discussion and then attach them to the proper chart.]
- E. After the *Milling to Music* activity, gather the students together. Elicit responses from students on the ideas and experiences they shared. Use the charts to record student responses. (Refer to the Teacher Reading *Milling to Music Chart Discussion Guide*.)
[Optional: Students may use the papers from the activities above to aid in remembering ideas to share in the class discussion. Students may then attach their “notes” to the proper chart.]

III. Drawing a Shoreline Habitat

- A. An image from the following website may help students visualize Hawai‘i’s shoreline habitat.
<http://www.intertidalHawai‘i.org/>
- B. Discuss as a class what a shoreline habitat looks like. Where does it start? Where does it end?



- C. As a class, create a large sketch of the shoreline habitat. This class mural will be used in subsequent lessons. This introductory sketch may be added to as the students learn more about the shoreline habitat via PowerPoint presentations, subsequent lessons, etc. It will be a “work in progress” throughout the unit.
[Suggestion: You may also do this activity individually using white paper and have each student draw their own or have each student draw one part and connect all of the student papers to create a larger mural.]
- D. You may want to have students include plants and animals that they know live in the shoreline habitat. (Students may not know of any shoreline organisms, or they may not know what section of the habitat to put them in. This is okay as they will be learning more about this habitat as the unit progresses.)
- E. Have students think about shoreline habitats.
[NOTE: Students will need to understand what the parts and conditions of the shoreline habitat are in order to understand why adaptations are important in subsequent lessons.]

IV. Hawaiian Shoreline Vocabulary Crossword Puzzle.

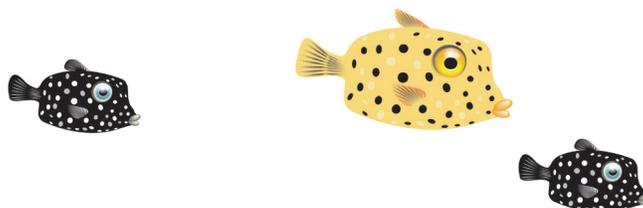
Review introduced shoreline vocabulary for this lesson. Provide a copy of the puzzle to each student. Use crossword puzzle as class work, or as homework to reinforce vocabulary.
[Suggestion: this may also be given as homework if all vocabulary words have been covered in the lesson.]

Extended Activities

1. Make an artificial tide pool community using various materials:
 - a. A low flat box (a plastic sweater box is great) for a dry artificial display.
 - b. Newspaper cut in 2-inch strips for paper maché. (Add water to white glue to make mixture for paper maché.) Use paper maché to make “live rocks” and to create uneven “rocky” surface in bottom of box.
 - c. Tempera paints, black, white, red, brown, green, pink, and orange.
 - d. 2- to 3-in. Styrofoam balls cut in half, package of barbecue sticks, and toothpicks. These will be used to make long-spined sea urchins and rock boring sea urchins.
 - e. Black pipe cleaners for making a Brittle star.
 - f. Old black/brown socks for making Sea Cucumber. Stuff socks with paper, put dots of white glue for “feet” on one side, sprinkle sand over glue, etc.
 - g. Modeling clay or play dough to make coral. (If you have dead coral specimens you can imprint them into the clay.)
 - h. Green and brown cellophane paper cut into strips for seaweed.
2. Integrate the following reading into this lesson, or add these books to your classroom library for the duration of the unit:

Orr, Katherine. (1994). *Discover Hawai‘i’s Sandy Beaches and Tide pools*. Island Heritage Press, Honolulu, HI.

Obi‘a Project grade K-3 Spotlight on the Marsh-A Play Script. (1991). Bishop Museum and Moanalua Gardens Foundation.



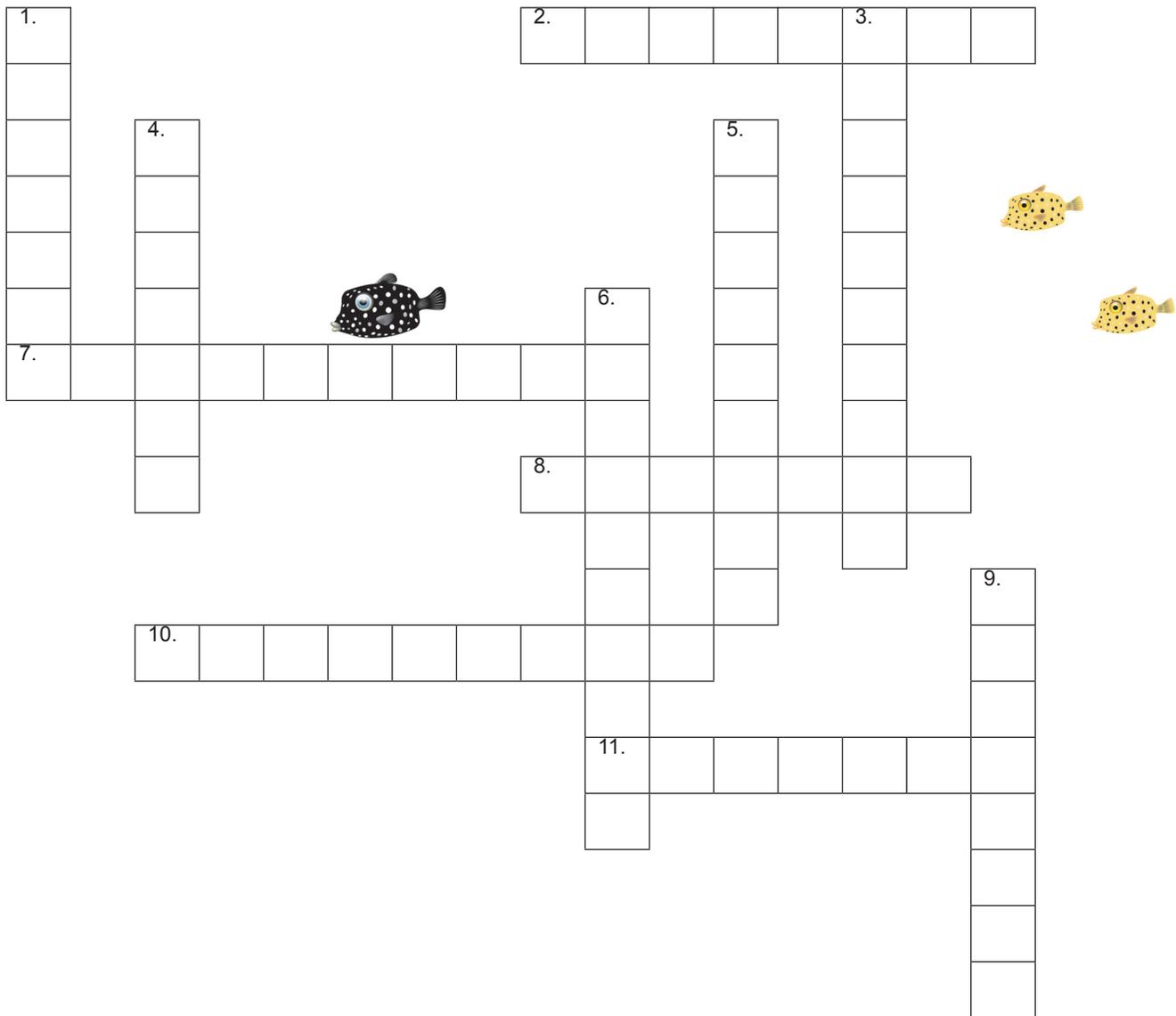
LESSON 1 Teacher Reading

Milling to Music Chart Discussion Guide

In facilitating discussions, prepare for the following possible student responses to the questions on Charts 1, 2, and 3:

Question	Possible Responses
<p>Chart 1: What are the different intertidal zones and what are their characteristics? What are some plants and animals that live in each zone?</p>	<ul style="list-style-type: none"> • Littoral Fringe <ul style="list-style-type: none"> ○ Birds ○ Trees/ plants • High intertidal <ul style="list-style-type: none"> ○ Crabs • Middle Intertidal <ul style="list-style-type: none"> ○ Shells (snails) • Low intertidal <ul style="list-style-type: none"> ○ Small fish ○ Urchins
<p>Chart 2: How do they protect themselves from the elements and how do they protect themselves from other animals?</p>	<ul style="list-style-type: none"> • Crabs—shell. • Birds. (If possible, have students elaborate, and list specific species.)—fly away, coloring • Small fish— hide, quick. • Urchins—spiny and prickly. • Shells (snails)—hard covering to hide in, and to keep the water in, and air out. • Trees/plants. (Again, have students elaborate and list specific species.)—thick waxy leaves, strong roots, doesn't need a lot of freshwater. • Organisms with the ability to relocate to wetter areas, and/or to contract to keep water in during low tides. • Pigments on the surface of the plant or animal to help it deal with the sun's rays. • Strong foot muscles or attachments to hold onto the rocks as waves sweep over them.

Hawaiian Shoreline Habitats Puzzle



Across

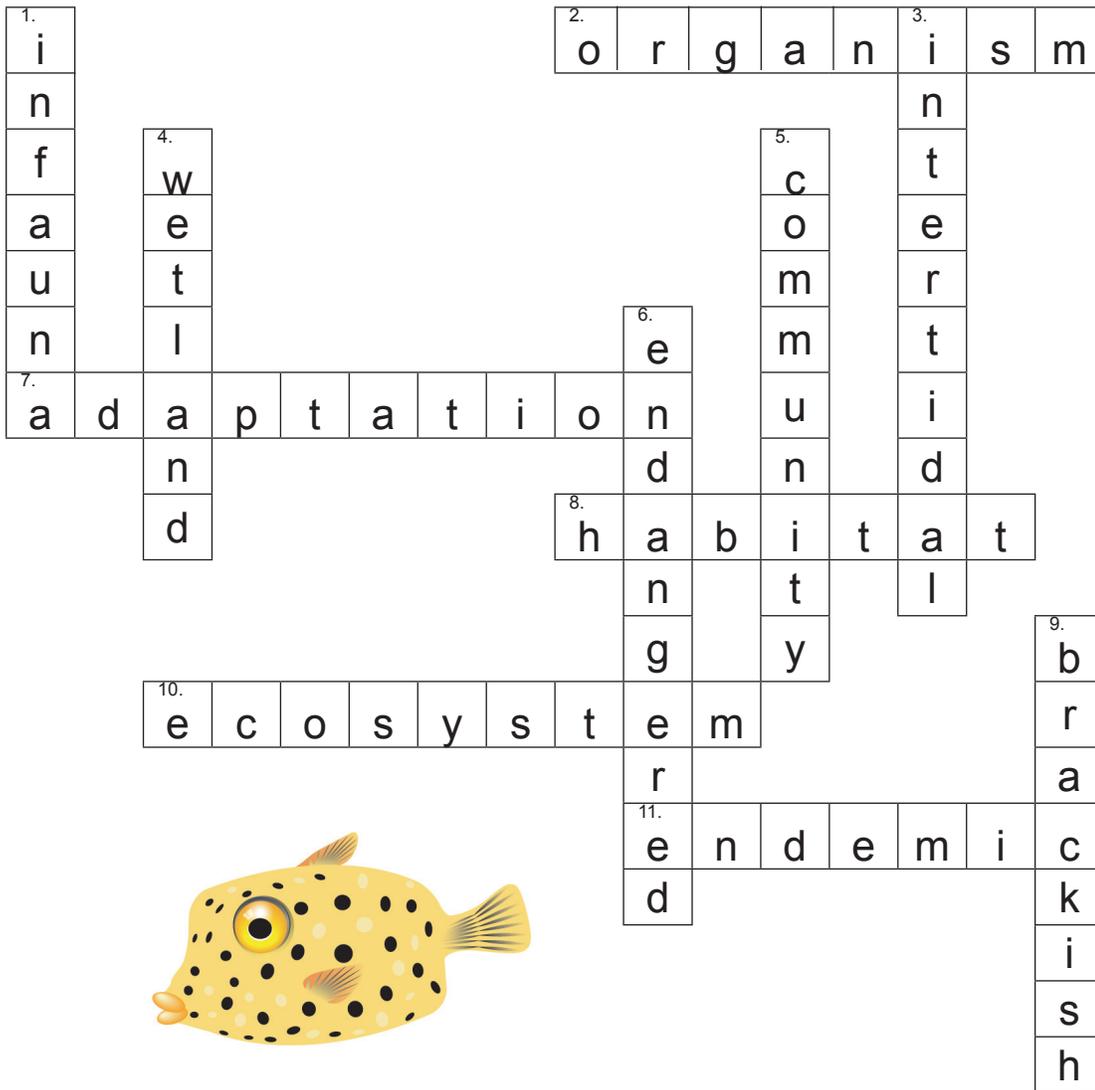
2. An individual living system.
7. A change in a plant or animal that enables it to survive in its environment.
8. A place where a plant or animal naturally lives and grows.
10. A community of living organisms, and the surroundings in which they are found.
11. A native species that evolved to become unique to a certain area.

Down

1. Organisms that live within the sand.
3. A shore zone between the high-tide and low-tide marks.
4. An area that is regularly wet or flooded.
5. A naturally occurring grouping of plant and animal species living within a defined area or habitat.
6. A species in immediate danger of extinction.
9. Water that is part salt and part fresh.

Hawaiian Shoreline Habitats Puzzle

Teacher Answer Key



Across

Answer

2. An individual living system.	organism
7. A change in a plant or animal that enables it to survive in its environment.	adaption
8. A place where a plant, or animal naturally lives and grows.	habitat
10. A community of living organisms, and the surroundings in which they are found.	ecosystem
11. A native species that evolved to become unique to a certain area.	endemic

Down

1. Organisms that live within the sand.	infauna
3. A shore zone between the high-tide and low-tide marks.	intertidal
4. An area that is regularly wet or flooded.	wetland
5. A naturally occurring grouping of plant and animal species living within a defined area or habitat.	community
6. A species in immediate danger of extinction.	endangered
9. Water that is part salt and part fresh.	brackish

LESSON 1 Teacher Resource Checklist

Hawai'i's Shoreline Habitats

Name	<i>SC 3.4.1</i> Compare distinct structures of living things that help them to survive (class discussion: chart 2)	<i>SC 3.5.1</i> Describe the relationship between structure and function in organisms (class discussion: chart 2)	<i>LA 3.6.1</i> Use oral language to obtain information, complete a task, and share ideas and personal opinions with others (class discussion: Milling/charts)
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