

SITE FOR SORI

This guide offers suggestions for how to implement the “Site for Sori” activity. This activity was developed by the [GoFlag](#) project. A key goal of the project is to improve public awareness about plants in general and provide specific information about a special group of plants called flagellate plants.

Flagellate plants have existed on our planet for a long time and they offer some important clues on how plants evolve and adapt. There are several ways to classify flagellate plants based on their genetic and morphological traits but one of their most unique features is the absence of flowers.

The “[Site for Sori](#)” a 50-minute web-based activity that portrays ferns – a group of flagellate plants found worldwide. Some of the environments where you can find ferns include: tropical forests, deserts, and even underwater! As other flagellate plants, ferns do not have flowers, however, they do have a vascular tissue that conducts water and nutrients. The Site for Sori activity is a great way to familiarize the next generation of scientists with this incredible plant. The activity can be further customized based on the needs of your learners and on their learning context.

GRADE LEVEL

- Middle school
- High school
- Introductory Biology courses in undergraduate programs

*You can find additional activities for this and other age-groups at the project’s website: [GoFlag Voyager](#).

LEARNING OBJECTIVES

- Describe the different parts of a fern.
- Measure the width and length of ferns’ leaves (fronds).
- Contribute to the scientific community by participating in the Site for Sori project as a volunteer in a community of science project.
- Increase awareness of the connections between the morphological and genetic features in ferns.

CURRICULAR CONNECTIONS

- Visual-spatial abilities
- Natural history
- Citizen science
- Reproduction
- Genetics

MATERIALS AND RESOURCES

- Link to online activity: [Site for Sori](#)
- Computers (laptop, Chromebook, tablet, smartphone)
- Internet connection
- Projector (if used as a whole class activity)

IMPLEMENTATION SUGGESTIONS

- Face-to-face classroom
- Enrichment
- Informal learning (e.g. community garden projects)

PRE-ACTIVITY IDEAS (ANCHORING)

- Invite a botanist to introduce the concept of flagellate plants and discuss their importance.
- Ask students to bring a fern plant to class to discuss their morphological features (small group activity of up to three students).
- Show the students a slideshow of plant photos and ask them to describe how ferns are different from other flowerless plants.

PROCEDURE

As a face-to-face, online, or blended activity, the material can be used to prompt discussion on and reflections about ferns, their morphological features, and reproduction strategies. Additionally, the learning material can be used to promote community of science initiatives that support learners' involvement in the culture of science and scientific inquiry:

Instructor

- Divide the class into groups of three.
- Ask each group to complete the tutorial and 5 tasks at the Site for Sori website as a homework.
- Request an artifact from each group (e.g., poster, hand-made model) featuring three elements from the tutorial and tasks (e.g., classification of ferns based on their leaves).

Students

- Present their artifacts.
- Provide a rationale for selecting some specific concepts and for creating the artifacts presented.
- Create individual concept maps to summarize their prior knowledge and the information they learned by participating in the Site for Sori project.

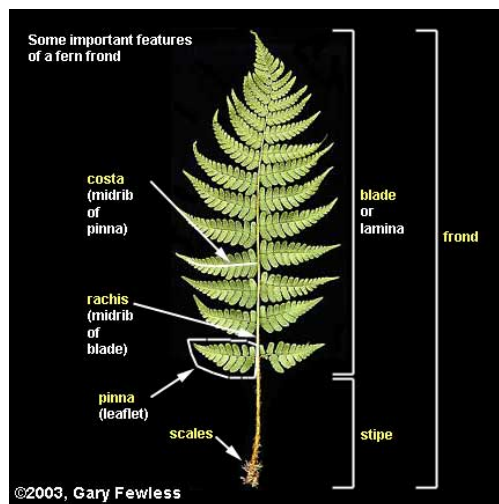
Instructor-Class

- Evaluate how each artifact represents one or multiple concepts from the tutorial and tasks.
- Expand the discussion by asking follow-up questions.
- Provide and receive feedback.
- Analyze the advantages and challenges related to the experience of participating in a community of science project

Example

- Students can describe whether this was their first experience participating in a community of science initiative?
- Instructor can emphasize the repetitive nature of scientific procedures (e.g., measure plants, sample soil) and parallel these actions to the tasks students conducted at the Site for Sori website. This discussion will provide an opportunity for students to evaluate the importance of intrinsic motivation and curiosity that support the work scientists do.
- Expand activity with individual reflective journals where each student will:
 - Identify another topic in the natural sciences (e.g., rock formation, peatland areas, flowering plants) and look for existing community of science initiatives that address these topics” [possible answers: [The Big Moss Mat](#), [budburst](#), [myFOSSIL](#)]
 - Write a reflective journal about the project selected and the rationale for selecting the project

PREREQUISITE KNOWLEDGE AND VOCABULARY



Fern Leaf Terminology

- *frond* – the leaf of a fern
- *blade* or *lamina* – the green portion of the leaf
- *stipe* or *petiole* – the stem-like portion of the leaf below the blade

- *pinna* – a large section or division of the leaf, if it is divided. Plural is *pinnae*.
- *pinnule* – a smaller leaf division, if the pinna itself is divided.
- *rachis* and *costa* – these both refer to major veins, or midribs, in different parts of the frond

*Additional vocabulary can be found at the [Site for Sori](#) tutorial

EXTENSION IDEAS

- Provide more information about the life cycle of ferns: [Ferns Pteridophyte life cycle](#), [Operation: Emerald Leaf](#)
- Further discussion about the characteristics of ferns: [All About Ferns](#)
- Illustrate differences between non-flowering and flowering plants: [Plants species](#)
- Identify concepts of life sciences: [Disciplinary Core Ideas](#)
- Provide insights on the work of scientists: [Scientific and Engineering Practices](#)

ALIGNMENT WITH NEXT GENERATION SCIENCE STANDARDS

High School: HS-LS3-1: Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring
<http://www.nextgenscience.org/pe/hs-ls3-1-heredity-inheritance-and-variation-traits>

ALIGNMENT WITH COMMON CORE STATE STANDARDS

RST.11-12.9: Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. (HS-LS3-1)
<http://www.corestandards.org/ELA-Literacy/RST/11-12/>