

## L9 Earth Art: Creating Patterns in Nature

▶ SEASONS: 🍁 ❄️ 🌸

▶ SUBJECTS: 🎨

▶ EXT. SUBJECT: 📐

▶ PREP TIME: 🕒

▶ LESSON TIME: 🕒 → 🕒



### MATERIALS

*For the class:* computer with Internet access, camera (optional), outdoor space with a variety of natural objects

### Description

Students explore patterns, color, and contrast as they create earth-friendly sculptures outside. Preparation for this lesson involves identifying an appropriate outdoor space, gathering photographs of Andy Goldsworthy's artwork either through the provided Internet links in the Online Connections or from the books or videos listed in the Resources section, and reviewing the Earth Art Rubric and Earth Art Guidelines.

Students first examine photographs of Goldsworthy's art and discuss his use of natural objects. After a discussion of the guidelines for creating earth art, students spend time outside gathering and arranging natural materials. Upon completing their art, students can share their creations while exploring each other's use of color, contrast, and patterns. To emphasize the importance of avoiding negative environmental impacts, students replace their found materials.

The process of collecting and arranging materials in a way that doesn't harm their surroundings should help students develop a respect for natural living and nonliving things. In addition, they should begin to develop an appreciation for how versatile art can be while exploring their own creative process.

To further explore patterns in nature, students can learn about Fibonacci numbers and investigate spiral patterns.

### Objectives

- Look for patterns in nature.
- Identify, reproduce, describe, extend, and create simple color, number, and shape repeating patterns.
- Distinguish between living and nonliving objects.
- Create two-dimensional and three-dimensional artwork using only natural materials.



### Background Information

In the late 1960s and early 1970s, earth art emerged as a form of art focused on and made up of the natural environment. Sticks, rocks, soil, plants, and other found objects from nature are assembled to make the works of art, which are often created out in the open and allowed to change according to natural conditions. Robert Smithson and Walter De Maria are two such artists who have made monumental earth works. You can explore samples of earth art by going to the Online Connections.

Andy Goldsworthy, a British artist and photographer, creates art made up of natural and found objects that explores the relationship of humans within nature. As a teenager, Goldsworthy began exploring patterns of nature by arranging natural objects in unexpected ways. Goldsworthy works with form and color to create a striking contrast between his art and its surroundings. Using such media as twigs, mud, snow, rocks, thorns, icicles, leaves, and flowers, Goldsworthy's art is often ephemeral. He documents his creations through photographs.



## Procedure ☹️→😊

1. Introduce the works of Goldsworthy by showing photos of his sculptures (see Online Connections for photographs). Ask students what they notice about the sculptures.
2. Explain that Goldsworthy uses only what is available to him in the environment. He doesn't add anything extra (e.g., glue, string, or tape to hold things together).
3. Ask students why they think Goldsworthy only uses natural objects in his sculptures. What patterns do they see? How does Goldsworthy use color? What happens to the objects when he is done? Do they think they could create art only using what they can find outside right now?
4. Provide students with the Earth Art Guidelines and review the Earth Art Rubric. They can work individually, with a partner, or in small groups.
5. Spend a few minutes brainstorming what natural objects they might find outside that could be used in their earth art.
6. Take the class outside (see Tips for Teaching Outdoors, p. 1) to collect their objects for about 10 minutes and then create their earth art arrangements (approximately 20 to 30 minutes). When they finish their artwork, the students should check with a peer to make sure it follows the Earth Art Guidelines.
7. If cameras are available, document the students' art with photographs.
8. Students can explain their artwork to the rest of the class. Discuss observable patterns and symmetry, how they created a contrast between the background and the art, and the difference between living and nonliving items.
9. Upon completion of the project, all objects should be returned to where they were found.

**! TIPS AND TRICKS**

Younger students can concentrate on color, simple patterns, and/or geometric shapes.

**SERVICE LEARNING**

**EARTH ART: ART SHOW**

Before replacing your natural materials, invite the community in to see your work or take pictures of your work to the community. Display them at local libraries, hospitals, or restaurants. Educate the public about art and nature. Have materials available so others can add to the exhibit.



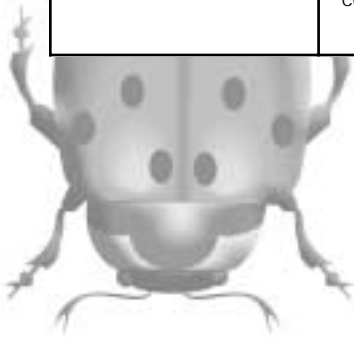
## Assessment

EARTH ART RUBRIC	4	3	2	1
Materials	Collects only natural objects and doesn't cause any harm to living things. Returns all objects when lesson complete. Follows guidelines completely.	Collects mostly natural objects and doesn't cause harm to any living things. Returns most objects when lesson complete. Mostly follows guidelines.	Collects some natural objects and tries not to cause harm to any living things. Returns some objects when lesson complete. Follows some guidelines.	Collects few if any natural objects. May or may not cause harm to any living things. Does not return objects when lesson complete. Fails to follow guidelines.
Patterns	Identifies, reproduces, describes, extends, and creates simple to complex color, number, and shape repeating patterns.	Is able to do at least three of the following: identify, reproduce, describe, extend, or create color, number, and/or shape repeating patterns.	Is able to do at least two of the following: identify, reproduce, describe, extend, or create simple color, number, or shape repeating patterns.	Is able to do at least one or at least tries one of the following: identify, reproduce, describe, extend, or create simple color, number, and/or shape repeating patterns.
Contrast/ Colors	Uses a variety of colors of natural objects. Artwork contrasts with background.	Uses some variety of colors of natural objects. Artwork has some contrast with background.	Uses only a little variety of colors of natural objects. Artwork has only a little contrast with background.	Uses little to no variety of colors of natural objects. Artwork blends in with background.
Behavior	Shows care and good use of time. Respectfully consults with a peer after completing artwork.	Shows some care and mostly good use of time. Consults with a peer after completing artwork.	Shows only a little care and some good use of time. May or may not consult with a peer after completing artwork.	Shows little to no care and little to no good use of time. Does not consult with peer after completing artwork.

### Math Extension: Fibonacci Numbers and Patterns in Nature

Although the natural world often appears to be random and chaotic, there are many examples of mathematical order. The Fibonacci number pattern, for example, occurs so frequently in nature (in flowers, shells, plants, leaves, etc.), that many refer to it as a basic “law of nature.” The Fibonacci series is a series of numbers in which each number is the sum of the preceding two numbers (e.g., 0, 1, 1, 2, 3, 5, 8, 13, . . .). Try it:  $0+1=1$ ;  $1+1=2$ ;  $1+2=3$ ;  $2+3=5$ ; etc.). The resulting numbers are called Fibonacci numbers.

Fibonacci numbers can be found in flowers. If you count the spiral pattern you often see in flower petals, you'll find the number of spirals is usually a Fibonacci number. The same thing can also be found in seed arrangements on flower heads. This may be because this arrangement allows the plant to package its seeds most effectively. No matter what the size of the seed head, the seeds are packed together uniformly.



Collect pine cones, soak them in water so they close up, and count the spirals in both directions. Look at a pineapple. Can you find the same spiral pattern? How many spirals are there in each direction? See the Online Connections for interactive examples of how to count the pine cone and pineapple spirals, as well as extensive background information on Fibonacci numbers.

For an added challenge, students can try creating their own Fibonacci-Goldsworthy inspired artwork, incorporating Fibonacci spirals and found materials!

### Resources

Goldsworthy, Andy. Andy Goldsworthy: A Collaboration with Nature. New York: Harry N. Abrams, 1990.

*Goldsworthy records his works in the 120 full-color photographs that are the subject of this book. His introduction explains his working methods and philosophy. (Note: Other collections of Andy Goldsworthy's work are also available through local libraries.)*

Kohl, MaryAnn F., and Gainer, Cindy. Good Earth Art: Environmental Art for Kids. Bellingham: Bright Ring Publishing, 1991.

*Over 200 projects for painting and drawing, sculpture and mobiles, collage and printing, weaving and crafts, and handmade art supplies emphasize recycling and natural materials.*

Rivers and Tides: Andy Goldsworthy Working with Time. Dir. Annedore V. Donop. DVD. 2001. New Video Group, 2004.

*Documentary about Goldsworthy that shows his work in action and some of the pieces he has created.*

### Online Connections

Visit the Berkshire Museum's Living Landscapes website at [www.berkshireremuseum.org/programs/educators.html](http://www.berkshireremuseum.org/programs/educators.html) for the following online activities or resources:

- Further information on Andy Goldsworthy
- Examples of earth art
- Background on and examples of Fibonacci numbers in nature

**MASSACHUSETTS FRAMEWORKS**

Science: Life Science: Characteristics of Living Things	Pre K-2	2. Differentiate between living and nonliving things. Group both living and nonliving things according to the characteristics they share.
Science: Life Science: Living Things and Their Environment	Pre K-2	6. Recognize that people and other animals interact with the environment through their senses of sight, hearing, touch, smell, and taste.
Science: Technology/Engineering: Materials and Tools	Pre K-2	1.1 Identify and describe characteristics of natural materials and human-made materials. 1.2 Identify and explain some possible uses for natural materials and human-made materials.
Mathematics: Patterns, Relations, and Algebra	Grades 1-2 * For Extension	2.P.3 Describe and create addition and subtraction number patterns, e.g., 1, 4, 7, 10 . . . ; or 25, 23, 21 . . . . :
Visual Arts: Standard 1: Materials, Methods, and Techniques	Pre K-4	1. Use a variety of materials and media, and understand how to use them to produce different visual effects. 2. Create artwork in a variety of two-dimensional (2D) and three-dimensional (3D) media.
	Grades 5-8	5. Expand the repertoire of 2D and 3D art processes, techniques, and materials with a focus on the range of effects possible within each medium.
Visual Arts: Standard 2: Elements and Principles of Design	Pre K-4	1. For color, explore and experiment with the use of color in dry and wet media, explore how color can convey mood and emotion. 2. For line, explore the use of line in 2D and 3D works. Identify a wide variety of types of lines in the environment and in artwork. 3. For texture, explore the use of textures in 2D and 3D works. Identify a wide variety of types of textures, for example, smooth, rough, and bumpy, in the environment and in artwork. 4. For shape and form, explore the use of shapes and forms in 2D and 3D works. Identify simple shapes of different sizes, for example, circles, squares, triangles, and forms, for example, spheres, cones, cubes, in the environment and in artwork. 5. For pattern and symmetry, explore the use of patterns and symmetrical shapes in 2D and 3D works. Identify patterns and symmetrical forms and shapes in the environment and artwork.
	Grades 5-8	10. For shape, form, and pattern, use and be able to identify an expanding and increasingly sophisticated array of shapes and forms, such as organic, geometric, positive and negative, or varieties of symmetry. 11. For space and composition, create unified 2D and 3D compositions that demonstrate an understanding of balance, repetition, rhythm, scale, proportion, unity, harmony, and emphasis. Create 2D compositions that give the illusion of 3D space and volume.
Visual Arts: Standard 3: Observation, Abstraction, Invention, and Expression	Pre K-4	1. Create 2D and 3D artwork from direct observation. 2. Create 2D and 3D expressive artwork that explores abstraction. 3. Create 2D and 3D artwork from memory or imagination to tell a story or embody an idea or fantasy.
	Grades 5-8	4. Create 2D and 3D representational artwork from direct observation in order to develop skills of perception, discrimination, physical coordination, and memory of detail. 6. Create artwork that employs the use of free form symbolic imagery that demonstrates personal invention, and/or conveys ideas and emotions.

The lesson also addresses the Massachusetts Science and Technology Curriculum Framework's Science Skills of Inquiry.



## Earth Art Guidelines

- 1.** Only natural (no human-made) materials can be used in the construction process. The sculptures should be entirely natural (no tin cans, glass, wire, brick, etc.).
- 2.** Gather many colors of leaves, flowers, rocks, and sticks, but please do not pull any plants up from the roots, break off branches from living plants, or use any animal life. If you see only one or two examples of a given type of plant, choose other more abundant plants to collect from.
- 3.** Sticks should be no longer than your arm.
- 4.** Rocks should be no bigger than what you can carry.
- 5.** Be sure to make a contrast between the background and the art arrangement. If you are using green leaves, would you put them on green grass or brown dirt? Using different colors and values (dark to light) will allow you to create good contrast so the art doesn't blend into the background.
- 6.** You must stay in the designated outdoor area and in sight of the teacher.