GRADE 7

COAST TO CACTUS
IN SOUTHERN CALIFORNIA

Curriculum and Lesson Plan Resource Guide

theNAT
SAN DIEGO NATURAL HISTORY MUSEUM

Donald C. & Elizabeth M. Dickinson Foundation • The Carol and Henry F. Hunte Fund at The San Diego Foundation

Grade 7

Wildfire Frequency

Essential Question

How many wildfires does San Diego County have each year?

Green chaparral scrub covers more than 20,000 square miles of California's hillsides. It's a habitat shaped by drought, made up of plants that can withstand months without water. Months without water can mean fire. Natural fires that happen every 30 years or so can help keep chaparral habitat healthy. Fires enrich the soil and open the ground to sunlight. There are even plants and insects in the chaparral that can reproduce only after a fire. As the climate warms, fires aren't happening every 30 years. They are happening in the same place every 15 years, or 10 years, or four years.

Activity: Wildfire Rope Timeline

In this activity students use San Diego historical wildfire data to identify periods of increased wildfire occurrence and make long-term predictions based on their findings.

Materials

- Printed wildfire historical data sheets
- Printed flame cutout
- 6 pieces of rope or yarn 11 feet long
- Red and orange yarn
- Ruler or measuring tape
- Masking tape
- Scissors
- Notebook
- Writing tools

Wildfire Rope Timeline

This activity is best done by students working in groups before or after a visit to the *Coast to Cactus in Southern California* exhibition. *(See page 2 for activity instructions.)*

Advance Preparation

- Read through the activity instructions.
- Print data sheets.
- Cut rope or yarn into 6 pieces that are 11 feet long.

Activity

1. Begin by giving your students an introduction to the southern California climate and its relationship to wildfires. The climate type in much of southern California is described as Mediterranean climate, with winter rains and dry, hot summers. Months without water can mean fire. Natural fires that happen every 30 years or so can help keep chaparral habitat healthy. Fires enrich the soil and open the ground to sunlight. There are even plants and insects in the chaparral that can reproduce only after a fire. As the climate warms, fires aren't happening every 30 years. They are happening in the same place every 15 years, or 10 years, or four years.
2. Separate your class into six groups. Each group should be assigned a decade represented in the data set. These include 1960–1969, 1970–1979, 1980–1989, 1990–1999, 2000–2009, 2010–2014 (partial decade data).
3. Pass out the corresponding data sheets assigned to the groups. Let your students know that the information presented shows fire records for each year during that decade.

NGSS Alignment for Grade 7

Performance expectation: MS-ESS3-2

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking Questions and Defining Problems Analyzing and Interpreting Data Constructing Explanations and Designing Solutions Engaging in Argument from Evidence	**ESS3.B:** Natural Hazards **ESS3.D:** Global Climate Change	Patterns Cause and Effect Stability and Change

Interdisciplinary Common Core Connections: RST.6-8.1, RST.6-8.7, MP.2, 7.EE.B.4

4. Have your students start by calculating the average number of fires that occurred during their assigned decade.
5. Ask your students to share their findings: ***Which decade had the highest average number of fires? Which decade had the lowest?*** Have your students add up all of their decade averages and divide by the number of decades to find the average number of wildfires for the entire data set.
6. Pass out the cut rope pieces, red or orange yarn, masking tape, scissors, and a ruler or measuring tape to each group.
7. Let your students know that they will be graphing their data sets using the rope pieces. Each foot of rope represents a year. Have your students mark each one-foot increment of the rope with masking tape and label it with the year.
8. Have your students graph the number of wildfires from each year on this piece of rope. Students should attach the flame cutout on each year and label it with the number of fires.
9. After the graphing is finished, have your students attach all of the long pieces of rope together into correct decade order. It helps if you have a large space or can go outdoors to stretch out the long piece of rope. Have students identify periods of increased wildfire activity. They should look for series of consecutive years when the total number of wildfires was above the average for the total data set. Have them record the periods of high frequency in their notebooks.

Key words

Average
A number that is calculated by adding quantities together and then dividing the total by the number of quantities.

Drought
A long period of time during which there is very little or no rain.

Decade
A period of 10 years.

Semiarid
A climate or place that is partially arid, or semi-dry, having less than 20 inches of rain each year.

10. Have a discussion with your students about their findings. ***Did any year stand out for having a high number of wildfires? Has the frequency of wildfires increased or decreased within the years presented in the data set?***
11. Have your students write down their predictions for future wildfire patterns.

Extension

- Have your students research other historical data sets. ***Can they find information about rainfall in San Diego County?*** Students can research the relationship between rainfall and wildfires. Use the historical data sets for wildfires, and compare them side-by-side with the rainfall data.
- Have your students research the seasonality of fires. Students can research a more detailed data set for a specific year. Have them identify outlier fires that may fall outside of the typical season.

Key words

Frequency

The fact or condition of happening often; common occurrence of a particular event.

Wildfire

A fire in a natural area (such as a forest) that is not controlled and that can burn a large area very quickly.

Data

Facts or information used usually to calculate, analyze, or plan something.

What will they learn?

During this activity students learn that southern California wildfires vary from year to year. San Diego County's semiarid climate means that truly wet years are few and far between, and dry years are very common. Natural fires that happen every 30 years or so can help keep chaparral habitat healthy. As the climate warms, fires aren't happening every 30 years. They are happening in the same place every 15 years, or 10 years, or four years. Students calculate average number of wildfires for each decade using historical data and identify periods of frequent wildfires using a graph.

Additional Resources

- Visit the *Explore the Region from Coast to Cactus* website to learn more about the different habitats in the southern California region. You can find more information at **coasttocactus.sdnhm.org.**
- Check out a specimen from our Nature to You Loan Library. For more information visit **sdnat.org/specimensearch** or contact the Loan Library at **loanprogram@sdnhm.org** or 619.255.0236.
- Visit the San Diego Natural History Museum and explore our *Coast to Cactus in Southern California* exhibition. San Diego is known for its incredibly diverse terrain, ranging from the beaches and chaparral near the coast, to the mountains and the desert farther afield. Using specimens from the Museum's scientific collections, alongside immersive environments, hands-on exhibits, live animals, and innovative media, *Coast to Cactus in Southern California* illustrates that richness by taking visitors on a journey through these habitats to explore the plants and animals that live in them.

Year	Number of Wildfires in San Diego County Reported by CA Dept. of Forestry and Fire Protection
1960	124
1961	481
1962	158
1963	117
1964	138
1965	135
1966	175
1967	242
1968	314
1969	268

Year	Number of Wildfires in San Diego County Reported by CA Dept. of Forestry and Fire Protection
1970	317
1971	413
1972	321
1973	398
1974	606
1975	699
1976	527
1977	777
1978	552
1979	980

Year	Number of Wildfires in San Diego County Reported by CA Dept. of Forestry and Fire Protection
1980	767
1981	669
1982	550
1983	475
1984	541
1985	560
1986	648
1987	621
1988	654
1989	610

Year	Number of Wildfires in San Diego County Reported by CA Dept. of Forestry and Fire Protection
1990	637
1991	472
1992	756
1993	843
1994	774
1995	872
1996	1135
1997	916
1998	537
1999	599

Year	Number of Wildfires in San Diego County Reported by CA Dept. of Forestry and Fire Protection
2000	485
2001	517
2002	693
2003	569
2004	396
2005	466
2006	379
2007	169
2008	178
2009	148

Year	Number of Wildfires in San Diego County Reported by CA Dept. of Forestry and Fire Protection
2010	136
2011	196
2012	162
2013	197
2014	146