

## Rationale

To understand the complexities of condor nesting and captive rearing, students will illustrate the roles of condor families and conservationists.

## Time

Day 2 of three-day lesson  
Teaching time: one hour (approximately)

## Objectives

1. Students understand the roles of the condors and conservationists in breeding and nesting in captivity and the wild.
2. Students identify the typical dynamics of a condor family: incubating, mated pairs, brooding, etc.
3. Students chart nest success.

## Aligned Standards

NGSS: Communicating Information; Patterns  
LS4.D: Condor populations throughout California live in different areas of similar habitats as well as distinctly different habitats that support the same biological needs (i.e. Coastal coniferous forests vs. chaparral vs. high desert). Changes in the habitat from predators, humans, weather, trash, etc. will affect nest success.  
3.MD.B.3: Draw graphs to represent data sets.

## Vocabulary

nest technician  
fledge  
captive rearing

## Materials

Data table, charting or graphing materials, including paper and pencils

## Tech Integration

Nest Tech photo library  
Nest Cam use

## PROCEDURE – DAY 2

### IMAGES (10 minutes)

Teacher reviews photos or video illustrating conservationists and condor relationships and connections to Nest Activity from previous lessons.

### GRAPH (30 minutes)

Given data on nest success, students chart nest success using images, bar charts, or dot graphs. The teacher should frame this activity as if the students were conservationists, monitoring nest success. (Are the nests successful? What might they need to observe to gain more data?)

### EXPLORE (20 minutes)

Examine event cards that have been previously placed by the teacher. Students should respond with an event that describes their actions and place it in their nest. Once more, in preparation for the next lesson, the teacher “responds” with a second event placed in each nest.

## NEST TECH TRAINING II BIOLOGY I-2

The data collected on the number of eggs hatched in southern California does not include eggs in the captive population; this data reflects trends in wild eggs only.

Breeding began in the wild in 2001 in southern California with limited success. In contrast, the flock in Arizona after reintroduction was initially more successful. Some of the problems identified in the SoCal nests were: trash in the nests and in the crops and stomachs of condor, eggs not hatching, predation, and illness. Nest monitoring began. Nest success has since improved, probably due to conservation efforts such as nest monitoring, replacing eggs, and trash clean ups.

Data collected by Mee, Hamber, and Sinclair. From “Low Nest Success in a Reintroduced Population of California Condors” from *California Condors in the 21st Century* ed. Mee and Hall, p. 167.

Create a visual representation of:

YEAR	NO. OF BREEDING PAIRS	NO. EGGS LAID	NO. EGGS HATCHED	NO. CHICKS FLEDGED
2001	2	3	0	0
2002	3	3	3	0
2003	1	1	1	0
2004	3	3	3	1
2005	3	3	1	0

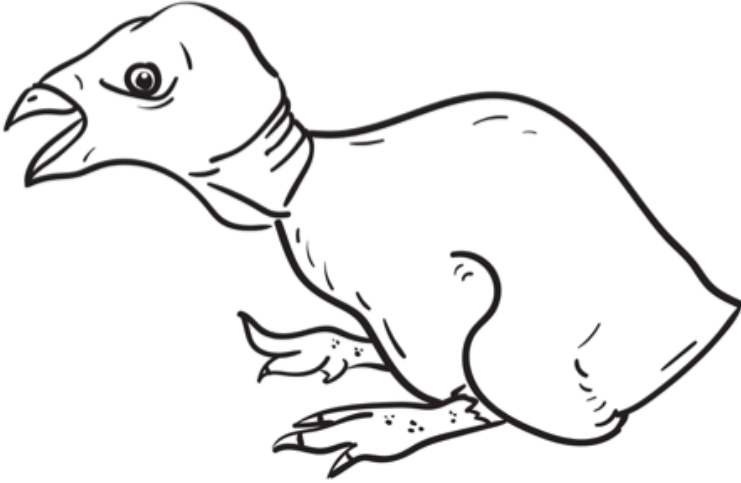
### VARIATION:

Compare the following in a line plot graph: year, number of eggs hatched, and number of eggs laid.

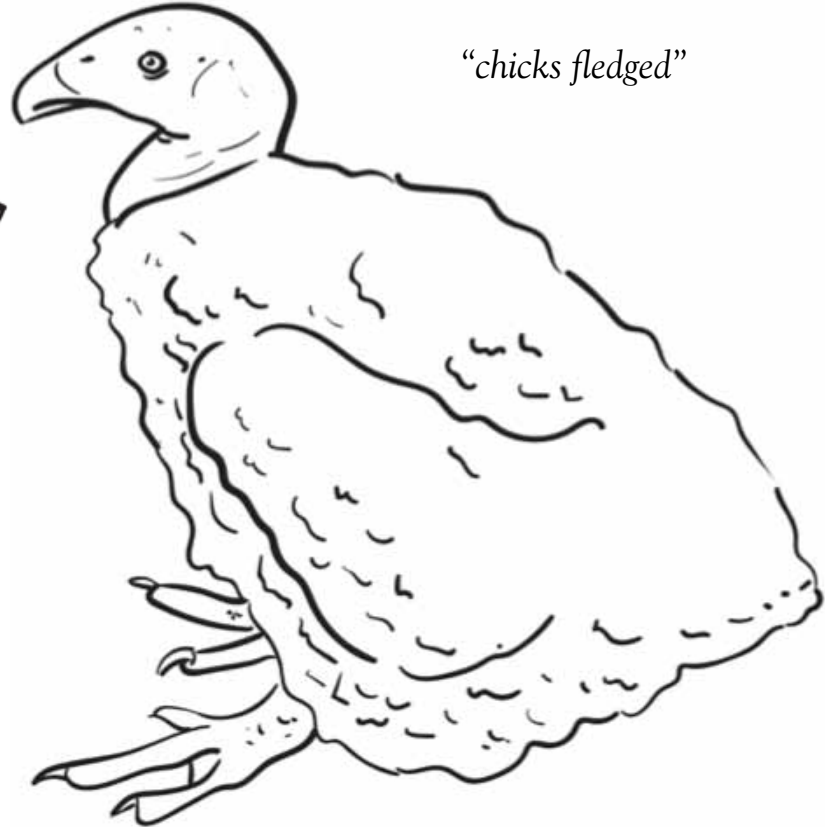
Compare in bar charts: number of chicks fledged.

Use these images in a poster-sized visual chart for the number of breeding pairs, number of eggs hatched, and number of chicks fledged.

*“chicks hatched”*



*“chicks fledged”*



*“breeding pairs”*

## Before you begin

Prep poster graph materials. Enlarge the illustrations for use in a large poster chart.

## What to do

As the class returns on the second day, inform them that nest activity has occurred overnight. They may choose to look at the event cards in their nests; however, they will not be referring to it directly until the end of the day's lesson.

The class will be accessing the nest cams to observe actual nests in real time.

Show the list of possible scenarios (event cards) to the class. Discuss what a nest technician might be looking for when (s)he inspects a nest. Do any of the nest cam nests seem to reflect any of these scenarios?

Inform the class that we will be examining how successful nesting has been over the past few years. Give them some statistics and ask them to infer... How many condors were there in the wild 100 years ago? 50? 20? Now? In the past 50 years, how many condor eggs do you think successfully hatched in the wild? Write their inferences on the board.

Taking on the role of Nest Technicians, ask the students to imagine going to check on these nests over long periods of time, monitoring every detail, and trying to determine how to help. Project the data table or draw a large version of one on the board. Divide the class into pairs. Then pass out the table of information on nest success and materials for charting/graphing. This includes larger images for students to place on a poster size graph they create or graph paper and pencils. For the poster-sized visual chart, have the students cut out the number of images necessary for their chart according to the data. In the column for number of eggs laid, have the students draw one egg or three eggs, depending on the data given. The poster should look like the table paired with this lesson. Students should glue the corresponding images onto the correct square as an illustration of the data. Fill in the visual chart one year at a time, emphasizing that the reintroduced condors had little success when released to the wild during the years in the nest success table of data.

Use variations to manipulate the data in graph form. Instruct the students to graph the data from the nest success table with the year as the x-axis and the number of chicks hatched as the y-axis. Discuss the trend.

Discuss the practice of captive-rearing and replacement-clutching. Wildlife biologists have raised chicks in a captive-environment, using puppets to cover their hands when feeding the chicks. This is part of captive-rearing. When necessary, nest techs will take an unfertilized egg from a wild nest, replace the condor's egg with a dummy egg, and replace the dummy egg with an egg from a breeding facility that is ready to hatch. Sometimes a fertilized egg can be removed from a captive or wild nest for captive-rearing, and the condors will produce another egg as a replacement. This is what is known as replacement-clutching. Not all bird species are capable of replacement-clutching.

Have the class infer why the statistics are so grim. Why would a nest be unsuccessful? What types of actions do you think the nest observers wanted to try?

Now have the students check on the status of their nests. With the information they have learned today, ask them to discuss as a group how to proceed in caring for their nest. Have them fill out an event card of their own to communicate the action they are taking as nest technicians. After placing it in their nest, have them individually journal their thoughts.

(After the class has left for the day, place an event card in each nest indicating activity that has taken place in response to their chosen action.)

### ELL MODIFICATION:

By using images in our graphing, ELL students are able to have visual access to the content or label them in Spanish.

Year	Number of Breeding Pairs	Number of Eggs Laid	Number of Eggs Hatched	Number of Chicks Fledged