

## Rationale

In order to engage with math and condor population statistics, students will use graphing techniques to illustrate population data.

## Objectives

1. Students identify the chronology of condor population numbers
2. Students understand the sense of urgency in the recovery program
3. Students practice math and data skills

## Aligned Standards

NGSS: Analyzing Data and Using Mathematics; Scale and Stability, Change  
ESS3.B: Hazards to condors include micro-trash, lead, hunting, etc. (3-ESS3-1)  
LS2.C: When food and habitat resources decline, the population declines. The question of condor resilience is proposed. The Condor Recovery Program's efforts are a partner in resilience but also a layer of the dynamic in the ecosystem.  
3.NBT.A.1 Place Value

## Time

One-day lesson  
Teaching time: 45 minutes (approximately)

## Vocabulary

endangered  
extinct  
population  
recovery

## Materials

M&M's, population charts, data chart organizer

## Tech Integration

Population charts photo library

## PROCEDURE – DAY 1

### IMAGES (10 minutes)

Look through different ways of charting population change. (Digital chart images)

### DATA (15 minutes)

The teacher should pass out m&m's and data chart worksheet while framing the lesson as conservationists in charge of communicating data.

### GRAPH (30 minutes)

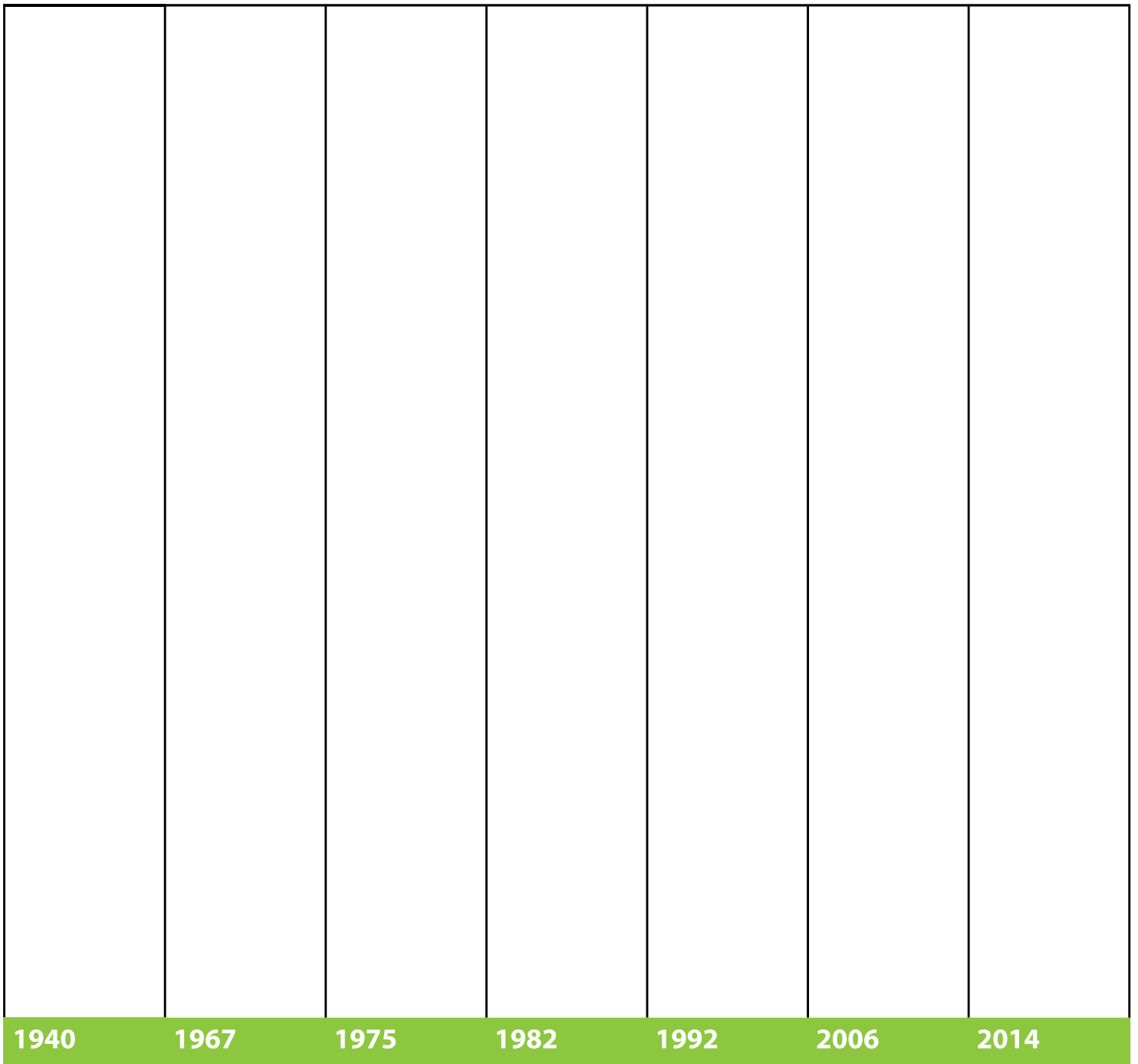
The students should create a key on their chart and select colors of M&M's to represent 1s, 5s, 10s, and 100s. Using M&M's the students should graphically represent the population info given in the various population charts. (i.e. For a population of 61 where blue is 10 and red is 1, the student should add 6 blue and 1 red M&M's.)

# POPULATION POINTERS CONSERVATION D

Year	Population
1940's	About 150
1967	61
1975	31
1982	22
1992	93
2006	284
2014	432

**Key:**

Color	Number



## Before you begin

Obtain M&M's or another small snack for counting.

## What to do

The condor population has experienced drastic changes over the past 55 years. It is amazing to see how the conservation efforts have affected the success of these birds.

Conservationists use many different tools to determine steps toward successful recovery. One of these tools is statistics. Statistics are numbers that can be used to show growth or decline over time. In this unit, we have looked at condor population in many different ways. Here are a few more ways to think of the numbers.

### Images

Project digital chart images of condor population change. Explain the different kinds of charts that represent numbers visually. Pass out the bar graph chart and make sure the class understands that they will be charting population by year (x-axis). Demonstrate the use of M&M's in this activity. Red ones will represent groups of 100, blue ones will represent groups of 10, and yellow ones are ones. Ask the class, "What colors do we want to see in each column?" "What does it mean when we don't have any reds?" Possible responses will be, "Then there aren't very many birds" or "birds have died."

### Data and Graph

For the year 1940, each student should place one red M&M and 5 blue M&M's in a straight line from the bottom to the top. Be sure that the class understands the importance of the COLORS, not the number of M&M's total. This is a skill in number sense that will be good to reinforce. Also remind them that population means ALL of the birds in the world. Ask them if they think 150 is a big number. Speculate, when this number was counted, do you think it was declining from a higher number?

- For the year 1967, notice there will be no red M&M's, 6 blue ones, and one yellow one. Ask the class what they think is happening. Is that a big change? Can they do the math? How many died?
- For 1975, once again, no red M&M's and now only 3 blue ones and one yellow one. Ask the class to do the subtraction.
- For 1982, use 2 blue M&M's and 2 yellow. Indicate that this was the year that people became very concerned. 22 birds... that is likely less than the number of students in your class!
- In 1992, something must've changed because now we need 9 blue M&M's and 3 yellow ones! What do they think happened? (This was when they captured all of the wild condors and bred them in captivity.)
- In 2006, there was an even more drastic change; we need 2 red M&M's, 8 blue ones, and 4 yellow!
- Finally, 2014, where we see the biggest growth, 4 red M&M's, 3 blue ones, and 2 yellow ones. What is contributing to this success?

Have students draw colored circles to represent M&M's onto their charts and put actual M&M's in a baggie to take home.

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(approximately)



OPTIONAL EXTENSION:  
Write "Red=100, Blue=10, and  
Yellow=1" on the board for reference.