

DATA Science

Classroom Mathematics California provides opportunities for students to build data literacy and develop data science skills in every strategy lesson and unit throughout the school year. Working with authentic real-world data, relevant, engaging topics, and a variety of data presentations, students strengthen their ability to work with and understand data.

Data Talks

Data Talks are Lesson Starts that represent an easy-to-implement, engaging approach to Data Science. Once per lesson, these 5–10 minute activities provide students with opportunities to explore data, develop data literacy, and apply grade-level mathematics.

Data Talks reflect the variety of data displays that students may see in school and in the world around them, including:

- familiar graphs in grade appropriate formats
- novel or innovative graphs

Students explore, make observations, interpret, and critique data displays.

LESSON 20 | SESSION 3 ■ ■ ■ ■

Develop

Purpose

- **Develop** strategies for finding the area of rectangles with fractional side lengths when the fractions are not unit fractions.
- **Recognize** that tiling a rectangle with fractional side lengths with “unit-fraction rectangles” gives the same result as using the area formula.

START DEVELOP DATA LITERACY

People Per Square Mile

DATA TALK
Ask students what they notice and wonder.
See Slide Notes.

Background
The U.S. has more than 3,000 counties. Fifty-eight of those counties are in California. Counties have different shapes, sizes, and populations. People study how population changes in counties, and they also analyze the population per square mile.

WHY? Support students in using their understanding of area to interpret a display.

DEVELOP ACADEMIC LANGUAGE

WHY? Develop students’ understanding of the different units used to measure area.

HOW? Make an anchor chart that lists different units that can be used to measure area, including square inch, square centimeter, and square foot. Accompany each term with an actual-size drawing. Read the units chorally while gesturing to show the sizes. Then have students practice stating which units they would use to measure the area of classroom items:

- I would measure _____ using _____.

TRY IT

Make Sense of the Problem
Before students work on Try It, use **Say It Another Way** to help them make sense of the problem. Ask a student to paraphrase the problem and describe the stamp in their own words. Use a show of thumbs from the class to evaluate the description.

425 Lesson 20 Multiply Fractions to Find Area

LESSON 20

Develop Tiling a Rectangle to Find Area

Read and try to solve the problem below.

A rectangular postage stamp has a length of $\frac{3}{4}$ inches and a width of $\frac{2}{3}$ inch. What is the area of the stamp in square inches?

TRY IT

Possible student work:

Sample A

$$\frac{3}{4} \times \frac{2}{3} = \frac{3}{4} \times \frac{2}{3} \times \frac{1}{1} = \frac{3}{4} \times \frac{2}{3} = \frac{2}{4} = \frac{1}{2}$$

The area of the stamp is $\frac{1}{2}$ square inches.

Sample B

Multiply the length and width:

$$\frac{3}{4} \times \frac{2}{3} = \frac{3 \times 2}{4 \times 3} = \frac{6}{12} = \frac{1}{2}$$

The area of the stamp is $\frac{1}{2}$ square inches, or $1 \frac{1}{2}$ square inches.

DISCUSS IT
Ask your partner: Can you explain that again?
Tell your partner: I started by...

Math Toolkit

- fraction models
- multiplication models
- half-inch grid paper
- index cards
- rulers

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DISCUSS IT

Support Partner Discussion
Encourage students to think about finding the area through tiling as well as to think about using the area formula, $\text{area} = \text{length} \times \text{width}$. Support as needed with questions such as:

- Did you and your partner use similar strategies or different strategies?
- Did either of you show how to tile the rectangle?

Common Misconception Look for students who add the numerators and add the denominators and get an area of $\frac{5}{6}$ in.², or 1 in.². As students present their solutions, have them explain the fractions and operations they used and why.

Select and Sequence Student Strategies
One possible order for whole class discussion:

- physical parts used to show tiling
- drawings to represent the problem
- equations that show adding the shaded parts of two wholes
- equations that show using the area formula

SMP 3, 6, 7, 8

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Start Data Talk

What do you notice?
What do you wonder?

Look at the data display on the next slide.

Data Source: U.S. Census Bureau

Start Data Talk

People Per Square Mile

What do you notice?
What do you wonder?

Look at the data display on the next slide.

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Start Data Talk

People Per Square Mile

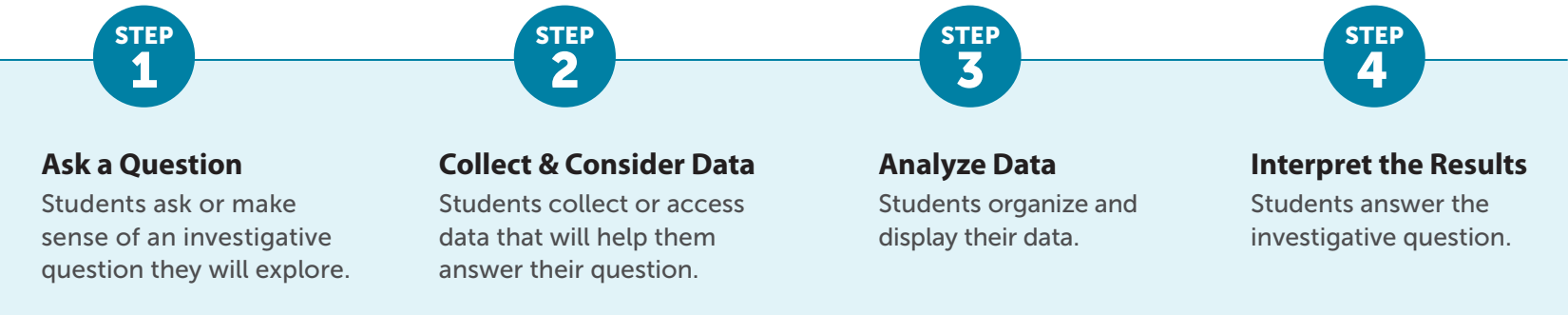
	San Benito County	Mono County	Trinity County	Imperial County	Fresno County
1980	18.0	2.8	3.7	22.1	86.1
2000	38.3	4.2	4.1	34.1	134.1

Data Source: U.S. Census Bureau

Data Talk displays are available in Appendix X in the Student Worktext, and the series of Data Talk slides are available on the Teacher Toolbox as part of the lesson presentation slides.

Data Investigations

Once per unit, Data Investigations offer students in-depth experience with a four-step Statistical Problem Solving Process (shown below).



What is a Data Investigation?

- Two-day end-of-unit option
- Develops **Data Literacy**
- Explores relevant, real-world topics
- Opportunity for students to apply and strengthen grade-level mathematics and SMPs

Available on the Teacher Toolbox 🖱️

Presentation slides, implementation support, and options to “simplify” or “extend” at various points in the Investigations allow teachers to adapt and present Data Investigations that fit the needs of their students, yearly pacing, and classroom.

DATA INVESTIGATION
UNIT 4

Name: _____

Sizing Up Butterflies

There are thousands of types of butterflies in the world! You can tell different kinds of butterflies apart by looking at the colors and the patterns on their wings. You can also look at their size.
In this investigation, you will explore the sizes of some butterflies found in California.

12 in.



The world's largest butterfly has a wingspan of 12 inches!

STEP 1

Ask a Question

You will use data to answer this investigative question:
What is the typical size of the butterflies on the Butterfly Cards?

STEP 2

Collect and Consider Data

Measure the wingspan of each butterfly.
You can measure to the nearest $\frac{1}{2}$ inch or to the nearest $\frac{1}{4}$ inch.
Use the Data Collection Sheet to record the measurements.

CHECKLIST

☐ Did you line up your ruler correctly?
☐ Did you measure all the butterflies the same way?

REFLECT AND REVISE

- Will your data help you answer the investigative question?
- Do you want to make changes to the investigative question?

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GRADE 5 • UNIT 4

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DATA INVESTIGATION
UNIT 4

Name: _____

STEP 3

Analyze Data

Make a line plot of your butterfly data on the Data Analysis Sheet.
Use your line plot to describe the wingspans.
Shortest wingspan:

Longest wingspan:

Most common wingspan:

CHECKLIST

☐ Did you label your number line?
☐ Did you give your line plot a title?
☐ Did you make an X for each measurement?

REFLECT AND REVISE

- Are you ready to answer the investigative question?
- Do you need to change the question, your measurements, or your line plot?

STEP 4

Interpret the Results

Answer the investigative question. Use your work from Step 3 to support your answer.

REFLECT AND REVISE

- How confident are you in your answer to the investigative question?
- Would you do anything differently if you did this investigation again?

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GRADE 5 • UNIT 4

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Go to Success Central for implementation support for Data Investigations.