

Comparing decimals and fractions through pet adoption

Grade: 4th & 5th

Materials Needed:

- Curriculum resources
- Printed handouts of activities and performance task
- Food scales (if doing weigh stations)
- Book(s) from Introduction
- Computers with Scratch or the Scratch app

Concepts:

- Adding and subtracting decimals and/or fractions
- Multiplying and dividing decimals and/or fractions

Learning Objectives:

Students will be able to...

- Compare two decimals and/or fractions
- Add, subtract, multiply, and divide decimals and/or fractions to the hundredths place
- Build knowledge of block coding through Scratch programming and how it connects to the word problem

What do students need to know prior to this lesson...

- Students should have had a formal introduction to decimals (to hundredths place) and fraction including comparing decimals and fractions using comparison symbols ($<$, $>$, $=$)
- Students should understand how to multiply decimals with whole numbers and how to multiply fractions with whole numbers

This lesson provides students with the opportunity to practice all of those skills while thinking about how much pets need to eat per day.

*This project has been funded by the **National Science Foundation (Award Number 2031364)**. For questions regarding this work, please contact the Silicon Valley Research Practice Partnership at nsf-svrpp@sccoe.org.*



Introduction:

The objective of the introduction is to make the learning in this lesson relevant to your students and it allows them familiarize and contextualize the content.

- Review students' prior learning connected and supporting the CCSSs
- Discuss with students if they have any pets and if they are aware of animal shelters like the Humane Society Silicon Valley.
- Read books related to adopting a pet.

Please note these are some suggested books to elicit students' prior knowledge.

You may choose to select other books or articles for your students.

You can find additional books about pets [here](#).



Click [here](#) for a read aloud version of this book.



Click [here](#) for a read aloud version of this book.



- You can also contact [Humane Society Silicon Valley \(HSSV\)](#) and invite a representative or volunteer to your classroom to talk about their experience at HSSV and the responsibilities it entails to adopt and care for an animal.
 - Note: If inviting someone to speak at your classroom is not feasible, then you may want to show some videos like [this one](#) to share what HSSV does.
 - Continue the discussion on the importance and benefits of animal shelters for the community.
- In order for students to understand how much dogs and cats need to be fed, you might consider having them read some articles on the needs that different animals need. The performance task quantities are based on these resources:

- [Dogs](#)
- [Cats](#)



This project has been funded by the **National Science Foundation (Award Number 2031364)**. For questions regarding this work, please contact the Silicon Valley Research Practice Partnership at nsf-svrpp@sccoe.org.

Engagement Activity:

There are a variety of hands-on activities that you can engage your students to compare decimals and/or fractions. Some of those activities might include:

- Decimal Dice
 - Students cut and build a dice with decimals (or create their own decimals) and roll the dice to compare decimals.
 - Note: You can modify this to fractions too!
- Have a weigh stations – select an area in the room where you will have several weight scales (food scales work great for this!) along with different materials for students to weigh and record.
 - In pairs or groups, students go to one of the stations and select different items to weigh and compare based on what they record.
 - Some suggested materials to weigh are:
 - Bite size candy such as M&Ms, nerds, Recess cups, etc.
 - Paper clips
 - Uncooked beans or pasta
 - Different coins
 - Erasers



Relevant Background Activities:

Math

- Review relevant content including adding, subtracting, multiplying decimals and/or fractions
- Review any relevant vocabulary

Computer Science



Explore CS First to acquaint students with Scratch. Try these lessons:



- Welcome to CS First (familiarize yourself with the platform)
- Storytelling – Lesson 6: Interactive Storytelling (conditionals)
- Game Design – Lesson 6: Launcher Game (variables to keep score)

This project has been funded by the **National Science Foundation (Award Number 2031364)**. For questions regarding this work, please contact the Silicon Valley Research Practice Partnership at nsf-svrpp@sccoe.org.

Performance Task:

- The performance task is based on a 5th grade SBAC task, however, instead of using clay (original task) students will help siblings convince their parents to adopt a dog (decimal comparison) or cat (fraction comparison). Students will help answer several questions regarding the amount of food needed to care for the dogs or cats. Some examples include:
 - How much do you feed a cat?
 - María and Gerardo are trying to convince their parents to adopt a cat or kitten from the Humane Society of Silicon Valley. To prove that they have done their research they present to their parents a chart on how much food a cat may need depending on their size.
- Students will have several questions where they need to use math to understand the feeding needs of the different kinds of cats and dogs.

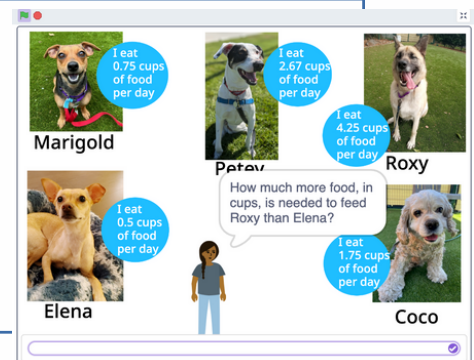
Dog	
Dog	Cups of food needed per day
Meet Petyr:  Weight: 55.2 lbs	2.75
Meet Coco:  Weight: 30 lbs	1.75

Cat/Kitten	
Cat/Kitten	Cups of food needed per day
Meet Lulu:  Weight: 8.56 lbs Age: 8 yrs	$\frac{3}{4}$
Meet Nutmeg:  Weight: 2.67 lbs Age: 3 months	$\frac{1}{3}$

Scratch Activity:

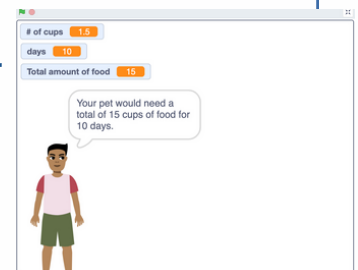
Complete a similar task with one of the Scratch Programs

- Decimals with Dogs
- Fractions with Cats



Extension:

- Students can create a pet food calculator. This calculator uses variables to determine how much food is needed for the pet. Students can modify the program to include additional pets or you can start with only one variable and have students add variables.
 - Students will need to figure out that they need to create an equation multiplying days and number of cups to determine the total amount of food needed for the days in question.*
- Students can create a game with different types of animals and how much food they need to eat per day and then have the player answer. This is an example program that students can use to build their game.
 - Students get a point for every correct answer and lose 0.5 points for every wrong answer.



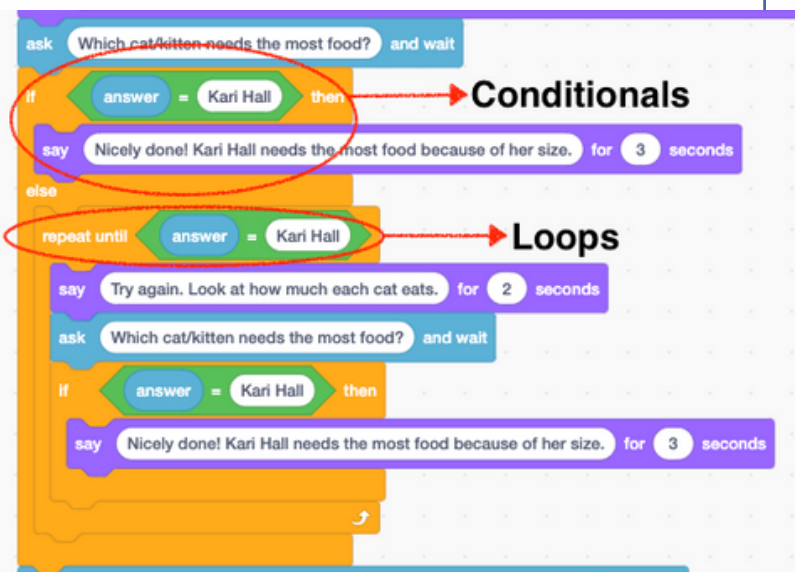
This project has been funded by the **National Science Foundation (Award Number 2031364)**. For questions regarding this work, please contact the Silicon Valley Research Practice Partnership at nsf-svrpp@sccoe.org.

Computer Science Concepts:

An explicit call out of a few select computer science concepts is important for students to realize that they are engaging in CS. In this lesson you can explicitly call out:

- Conditionals
- Loops

It's recommended that only 1-2 concepts are introduced at a time. This allows students to grasp the concepts in a manageable way.



Assessment:

- Teacher observation of student work (formative assessment of conceptual understanding – got it/didn't get it).
- Students create a presentation or write a paper trying to convince their parents that they would like to adopt a pet from the Humane Society of Silicon Valley.
 - Depending on how much time you have you may even invite parents and have them assess students' presentations.
- Formative assessment from your own curriculum.

Career Connections:

Did you know...

That there are many careers that require an understanding of decimals and fractions in their everyday work?

- The medical field is filled with different careers such as **doctors, nurses, or technicians** that need to be able to compare decimals. They might need to compare prescription dosage or how much of an intravenous (IV) saline drip needs to be administered based on the patient's weight and needs.
- **Veterinarians and vet technicians** are other careers where understanding fractions and decimals play a pivotal role in their careers. They need to know how much medicine to administer based on the animal's weight and condition.



This project has been funded by the **National Science Foundation (Award Number 2031364)**. For questions regarding this work, please contact the Silicon Valley Research Practice Partnership at nsf-svrpp@sccoe.org.

Common Core Math Standards

4.NF.2.

Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

5.NBT.3.b.

Compare two decimals to thousandths based on meanings of the digits in each place

5.NBT.7.

Add, subtract, multiply, and divide decimals to hundredths

Computer Science Student Standards

**CA CS
3-5.AP.11.**

Create programs that use variables to store and modify data.

**CA CS
3-5.AP.12.**

Create programs that include events, loops, and conditionals.

**CA CS
3-5.AP.14.**

Create programs by incorporating smaller portions of existing programs, to develop something new or add more advanced features.

**CSTA
1B.AP.09.**

Create programs that use variables to store and modify data.

**CSTA
1B.AP.10.**

Create programs that include sequences, events, loops, and conditionals.

**CSTA
1B.AP.12.**

Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.

*This project has been funded by the **National Science Foundation (Award Number 2031364)**. For questions regarding this work, please contact the Silicon Valley Research Practice Partnership at nsf-svrpp@sccoe.org.*

CSTA Teacher Standards

1a.

Apply CS practices

2c.

Represent diverse perspectives

2e.

Use accessible instructional materials

4c.

Design inclusive learning experiences

All images represented in this lesson were obtained through Canva and/or are part of the fair use law.

*This project has been funded by the **National Science Foundation (Award Number 2031364)**. For questions regarding this work, please contact the Silicon Valley Research Practice Partnership at nsf-svrpp@sccoe.org.*