Unit 3: Expressions and Equations

SBAC alignment for *Unit 3: Expressions and Equations Activity 1*

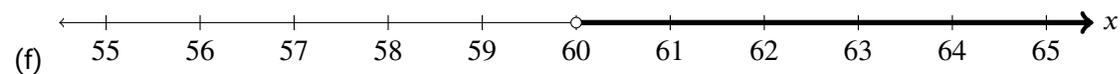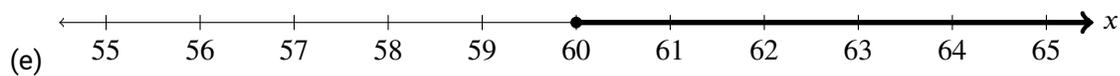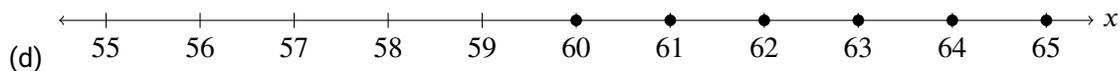| Claim(s)	**Claim 1: Concepts and Procedures** Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 F: Reason about and solve one-variable equations and inequalities.
Content Domain:	Expressions and Equations
Standard(s):	**6.EE.8** Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
DOK:	1

Unit 3: Expressions and Equations *Activity 1*

An inequality is shown.

$$x > 60$$

Select the statement(s) and number line(s) that can be represented by the inequality. Check all that apply.

(a) The temperature in Wai'anae, O'ahu is greater than 60°F.

(b) The value of a number substituted for x is greater than 60.

(c) The number of rainy days in Kaua'i increased by 60 this year.

(d)

(e)

(f)

SBAC alignment for *Unit 3: Expressions and Equations Activity 2*

Claim(s)	**Claim 1: Concepts and Procedures** Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 B: Apply and extend previous understandings of multiplication and division to divide fractions by fractions. 1 F: Reason about and solve one-variable equations and inequalities.
Content Domain:	The Number System
Standard(s):	**6.NS.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.). How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?* **6.EE.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
DOK:	1

Unit 3: Expressions and Equations *Activity 2*

A high priest is walking up Mauna Kea to make an offering to the gods. He has 3 and $1/2$ miles left to walk to reach the heiau (temple), but due to the high altitude and low oxygen, he can only walk $3/4$ miles at a time before he needs to stop and catch his breath.

1. Which equation can be used to find w, the total number of $3/4$ mile stretches of walking before the priest reaches the heiau?

   (a) $3\frac{1}{2} \times \frac{3}{4} = w$

   (b) $3\frac{1}{2} \div \frac{3}{4} = w$

   (c) $3\frac{1}{2} + w = \frac{3}{4}$

   (d) $3\frac{1}{2} - w = \frac{3}{4}$

2. Use the equation in part 1 to find w. Give your answer as a mixed fraction.

SBAC alignment for *Unit 3: Expressions and Equations Activity 3*

Claim(s)	**Claim 1: Concepts and Procedures** Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	1 F: Reason about and solve one-variable equations and inequalities.
Content Domain:	Expressions and Equations
Standard(s):	**6.EE.7** Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.
DOK:	1

Unit 3: Expressions and Equations *Activity 3*

Read each of the following problems. Match each situation with the equation that could be used to solve the problem. If neither equation works, select "Neither." The labels may be used more than one time.

During a storm, there were 25 hours of heavy rain, followed by many hours of flooding until the weather finally cleared up. Overall, there were 325 hours of rain and flooding. How many hours of flooding were there after the rain?

To prepare for a storm, your family bought cases of water containing 25 bottles each. In all, your family bought 325 bottles of water. How many cases did your family buy?

$25 + x = 325$

'Iniki had 25 cans of Vienna sausage in his cupboard. To help a large family in his neighborhood prepare for a storm, 'Iniki gave away some extra cans. The neighbors now have 325 cans. How many cans of Vienna sausage did 'Iniki give away?

$25x = 325$

Neither

During a long storm, 25 millimeters of rain fell per day. By the end of the storm, a total of 325 millimeters of rain had fallen. How many days of rain were there during this storm?

A tropical storm came and poured rain on Kaua'i and O'ahu. Kaua'i received 325 millimeters of rain while O'ahu received 25 millimeters of rain. How much more rain, x, did Kaua'i receive?

SBAC alignment for *Unit 3: Expressions and Equations Activity 4*

Claim(s)	**Claim 2: Problem Solving** (primary claim) Students can solve a range of complex, well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies. **Claim 1: Concepts and Procedures** (secondary claim) Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	2 A: Apply mathematics to solve well-posed problems arising in everyday life, society, and the workplace. 1 A: Understand ratio concepts and use ratio reasoning to solve problems. 1 C: Compute fluently with multi-digit numbers and find common factors and multiples.
Content Domain:	Ratios and Proportional Relationships (primary domain) The Number System (secondary domain)
Standard(s):	**6.RP.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. **6.NS.3** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
DOK:	3

Unit 3: Expressions and Equations *Activity 4*

A huge rainstorm is coming, and you plan to collect the rainwater in water barrels and use it to water the trees that survive the storm.

Water barrel

- You expect that 40 to 50 of the trees in your garden will survive the storm.

- One (1) water barrel can hold enough water for 3 to 4 trees for the rest of the year.

- Each water barrel costs $\$40.50$.

1. If you wanted to collect enough rain water to take care of all of your surviving trees for the rest of the year, how many water barrels would you buy? Show your work and justify your answer.

2. If you buy the number of water barrels you determined in Part 1, how much money would you spend on water barrels?

SBAC alignment for *Unit 3: Expressions and Equations Activity 5*

Claim(s)	**Claim 2: Problem Solving** (primary claim) Students can solve a range of well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies. **Claim 1: Concepts and Procedures** (secondary claim) Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Assessment Target(s):	2 C: Interpret results in the context of a situation. 2 A: Apply mathematics to solve well-posed problems arising from everyday life, society, and the workplace. 1 F: Reason about and solve one-variable equations and inequalities.
Content Domain:	Expressions and Equations
Standard(s):	**6.EE.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
DOK:	3

Unit 3: Expressions and Equations *Activity 5*

Aunty Lehua wants to grow some mountain naupaka. However, her home garden is too sunny for the naupaka to thrive so Aunty Lehua decides to build a shade house. A shade house is a house that is made of a material that lets some sunlight in, but not too much.

Naupaka flower
(not to scale)
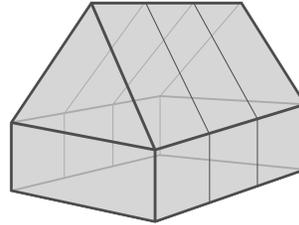
Shade house

1. Aunty Lehua's shade house requires 135 square feet of shade material. She only has 98 square feet and needs to go to the local hardware store to get more.

   The store only sells shade material in the following packs:

   - 37 square feet

   - 98 square feet

   - 135 square feet

   - 233 square feet

   What is the smallest pack that Aunty Lehua should buy to complete the shade house? Explain what your answer means in the context of the story.

2. Later, Aunty Lehua changed the design of her shade house. Instead of 135 square feet of shade material, her new design asks for at least 150 square feet. This can be modeled by the inequality $98 + x \geq 150$, where x is the amount of shade material she needs to buy (in square feet).

   The store started selling rolls of shade material that you can cut yourself and buy by the square foot. What is the least amount of shade material that Aunty Lehua needs to buy to satisfy our inequality?