

Mathematics!



A Story of Units Parent Handbook

GRADE K MODULE 3

Grade K • Module 3

Comparison of Length, Weight, Capacity, and Numbers to 10

OVERVIEW

Having observed, analyzed, and classified objects by shape into pre-determined categories in Module 2, students now compare and analyze length, weight, volume, and, finally, number in Module 3: longer *than*, shorter *than*, as long as; heavier *than*, lighter *than*, as heavy as; and more *than*, less *than*, the same as. “8 is *more than* 5. 5 is *less than* 8.” “5 is *the same as* 5.” “2 and 3 is also *the same as* 5.”

Topics A and B focus on comparison of length, Topic C on comparison of weight, and Topic D on comparison of volume. Each of these topics opens with an identification of the attribute being compared within the natural context of the lesson. For example, in Topic A, before exploring length, students realize they could have chosen to compare by a different attribute: weight, length, volume, or number.

- T: Students, when you compare and say it is bigger, let’s think about what we mean. (After each question, allow students to have a lively, brief discussion.)
- T: Do you mean that it is bigger like this book is *heavier than* this ribbon? (Dramatize the weight of the book and ribbon.)
- T: Do you mean that it is longer like this ribbon is *longer than* this book? (Dramatize the length of the ribbon.)
- T: Do you mean it takes up more space like this book *takes up more space* than the ribbon when it is all squished together? (Dramatize.)
- T: Do you mean to compare the number of things like *the number* of books and ribbons? (Dramatize a count.)
- T: So, we can compare things in different ways! Today, let’s compare by thinking about longer than, taller than, or shorter than. (Dramatize.)

After the Mid-Module Assessment, Topic E begins with an analysis using the question, “Is there enough?” This leads naturally from exploring when and if there is enough space to seeing whether there are enough chairs for a small set of students. “There are fewer chairs than students!” This bridges into Topics F and G, which present a sequence building towards the comparison of numerals, Topic F beginning with counting and matching sets to compare. The module culminates in a three-day exploration, one day devoted to each attribute: length, weight, and volume. The module closes with a culminating task devoted to distinguishing between the measurable attributes of a set of objects: a water bottle, cup, dropper, and juice box.

The module supports students’ understanding of amounts and their developing number sense. For example, counting how many small cups of rice are contained within a larger quantity provides a foundational concept of place value: Within a larger amount are smaller equal units, which together make up the whole. “4 cups of rice is the same as 1 mug of rice.” Compare that statement to “10 ones is the same as 1 ten”. As students become confident directly comparing the length of a pencil and a crayon with statements like, “The pencil is

longer than the crayon”, they will be ready in later grades to indirectly compare using length units with statements like, “The pencil is longer than the crayon because 7 cubes is more than 4 cubes” (**1. MD.2**).

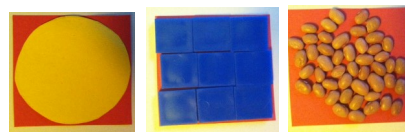
Additional foundational work for later grades:

Foundational work with equivalence. The length of a stick with 5 linking cubes is the same as the length of my cell phone. A pencil weighs the same as a stick with 5 linking cubes. Each module component on measurement closes with a focus on *the same as*.

Foundational work for the precise use and understanding of rulers and number lines. The module opens with lessons pointing out the importance of aligning endpoints in order to measure (as pictured below).



Foundational understanding of area. At the opening of the second half of the module, students informally explore area as they see whether a yellow circle fits inside a red square. They then see how many small blue squares will fit inside the red square and finally see that many beans cover the same area (also pictured to the right).



Foundation understanding for comparison. As students count to compare the length of linking cube sticks, they are laying the foundation for answering *how many more...than/less...than* questions in Grade 1.

Terminology

New or Recently Introduced Terms

- Balance scale (tool for weight measurement)
- Capacity (with reference to volume)
- Compare (specifically using direct comparison)
- Endpoint (with reference to alignment for direct comparison)
- Enough/not enough (comparative term)
- Heavier than/lighter than (weight comparison)
- Height (vertical distance measurement from bottom to top)
- Length (distance measurement from end to end; in a rectangular shape, length can be used to describe any of the four sides)
- Longer than/shorter than (length comparison)
- More than/fewer than (discrete quantity comparison)
- More than/less than (volume, area, and number comparisons)
- Taller than/shorter than (height comparison)
- The same as (comparative term)
- Weight (heaviness measurement)

Familiar Terms and Symbols

- Match (group items that are the same or that have the same given attribute)
- Numbers 1-10

Suggested Tools and Representations

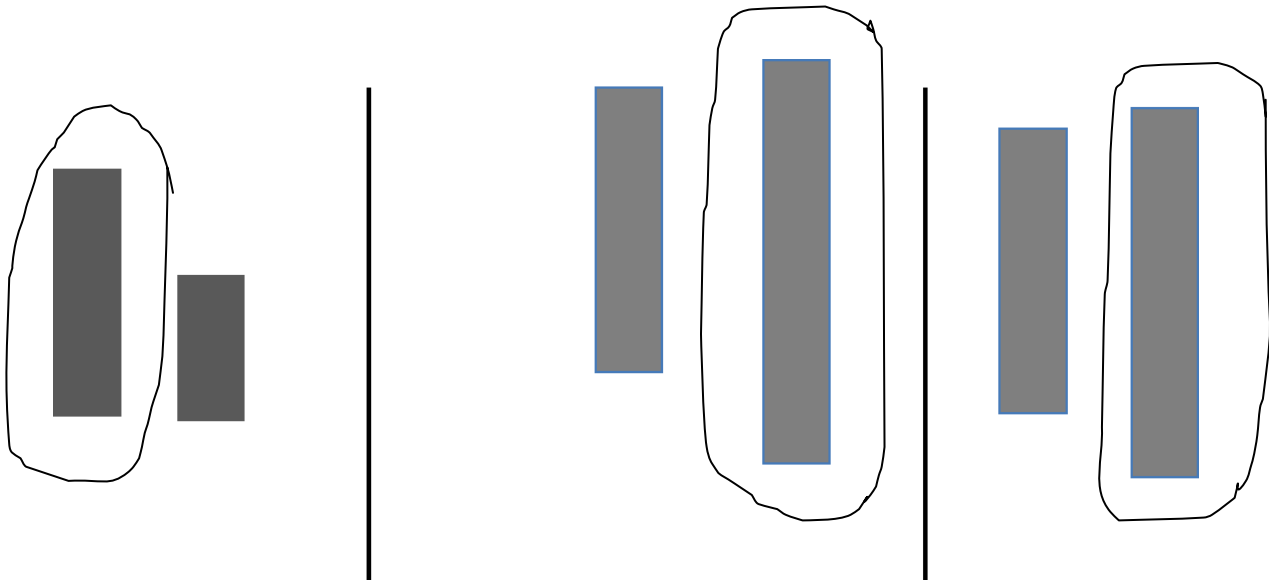
- Balance scales (as pictured to the right)
- Centimeter cubes
- Clay
- Linking cubes in sticks with a color change at the five
- Plastic cups and containers for measuring volume



Lesson 1

Objective: Compare lengths using *taller than* and *shorter than* with aligned and non-aligned endpoints.

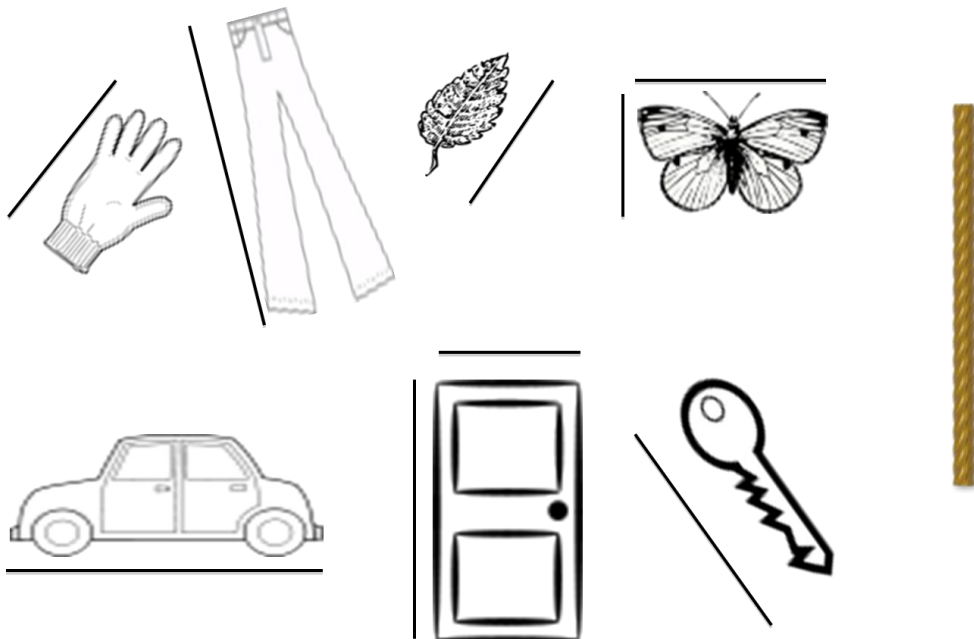
Directions: In each pair, circle the taller one. Imagine the paper strips are lying flat on a table.



Lesson 2

Objective: Compare length measurements with string.

Directions: Cut out the picture of the string on the right side of the page. Compare the string with each object to see which is longer. Use the line next to each object to help you compare.



Lesson 3

Objective: Make series of *longer than* and *shorter than* comparisons.

Directions: Take out a red and a blue crayon. Circle objects with lengths shorter than the crayon blue. Circle objects with lengths longer than the crayon on red.

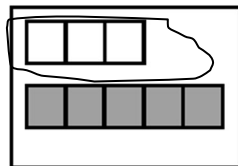


Pictures are distorted and not to scale so the directions were not followed.

Lesson 4

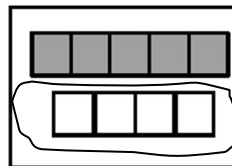
Objective: Compare the length of linking cube sticks to a 5-stick.

Circle the shorter stick.



How many linking cubes are in the shorter stick? Write the number in the box.

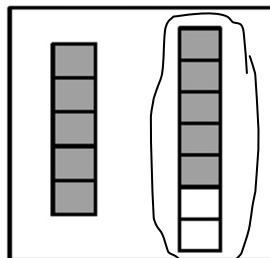
3



How many linking cubes are in the shorter stick? Write the number in the box.

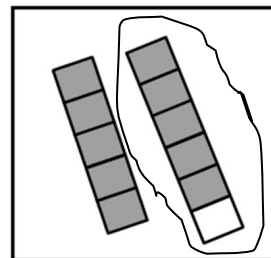
4

Circle the longer stick.



How many linking cubes are in the longer stick? Write the number in the box.

7



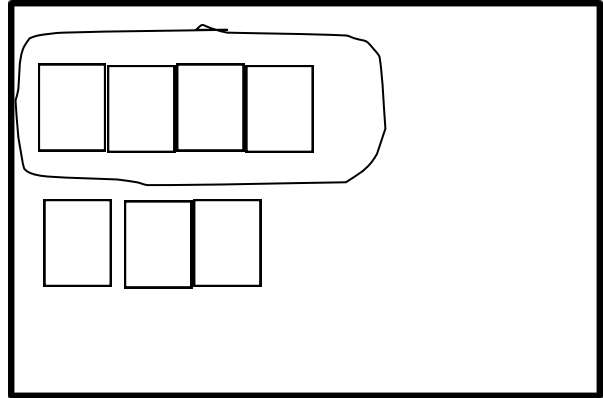
How many linking cubes are in the longer stick? Write the number in the box.

6

Lesson 5

Objective: Determine which linking cube stick is taller than or shorter than the other.

Directions: Circle the stick that is longer than the other.



The 4 stick is longer than the 3 stick. The 3 stick is shorter than the 4 stick.

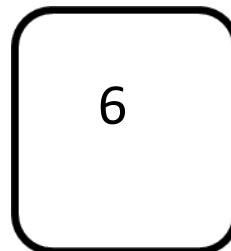
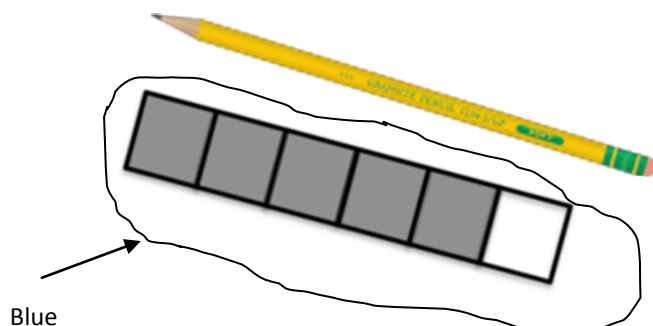
Lesson 6

Objective: Compare the length of linking cube sticks to various objects.

In the box, write the number of cubes there are in the pictured stick.

Draw a green circle around the stick if it is longer than the object.

Draw a blue circle around the stick if it is shorter than the object.



Lesson 7

Objective:
the same as.

Compare objects using



Color 2 cubes red. Color 3 cubes green.



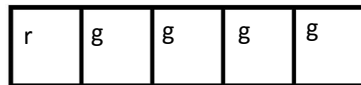
How many cubes did you color?

5

Is this stick the same length as the gray stick? YES NO

Together 2 cubes and 3 cubes are the same length as 5.

Color 1 cube red and the rest green.



How many cubes did you color?

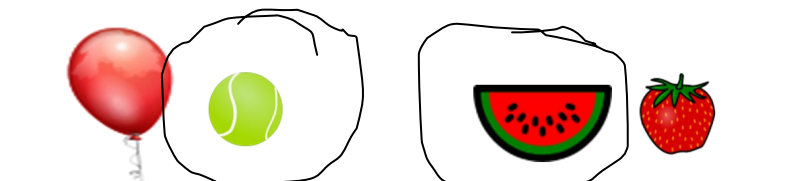
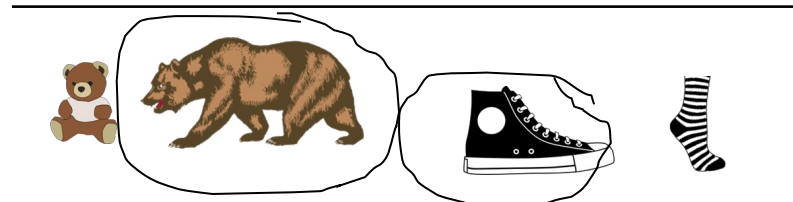
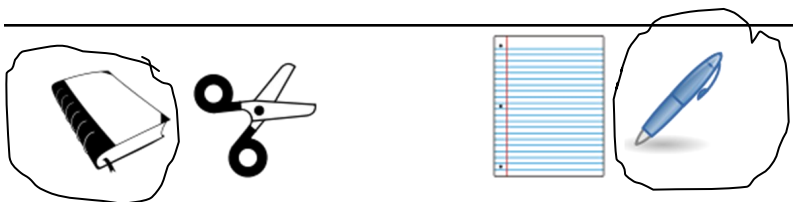
5

Is this stick the same length as the gray stick? YES NO

Together 1 cube and 4 cubes are the same length as 5.

Lesson 8

Objective: Compare using *heavier than* and *lighter than* with classroom objects.



Which is heavier?
Circle the object that
is heavier than the
other in each set of
two pictures.

Lesson 9

Objective: Compare objects using *heavier than*, *lighter than*, and *the same as* with balance scales.



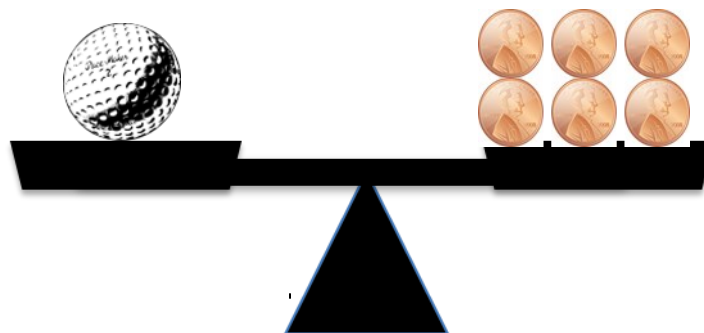
Lighter

Heavier

For homework, children will draw something that is heavier than another item shown on the balance scale, and something lighter than another item shown on the balance scale.

Lesson 10

Objective: Compare the weight of an object to a set of unit weights on a balance scale.

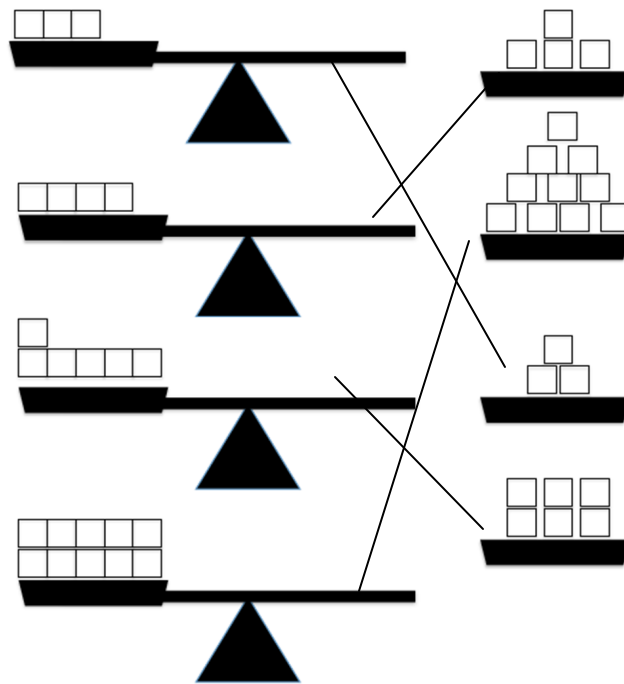


The golf ball is as heavy as
___6___ pennies.

Lesson 11

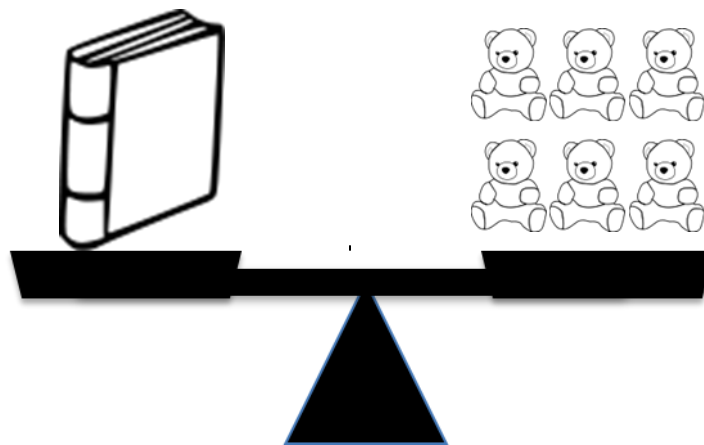
Objective: Observe conservation of weight on the balance scale.

Draw a line from the balance to the linking cubes that weigh the same.



Lesson 12

Objective: Compare the weight of an object with sets of different objects on a balance scale.

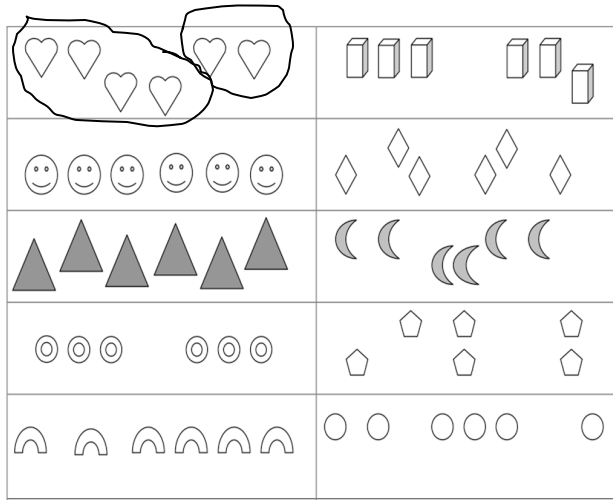


The book is as heavy as 6 counting bears.

Lesson 13

Objective: Compare volume using *more than*, *less than*, and *the same* as by pouring.

Since we are working on volume and capacity in class, have your child explore by pouring liquid from one container to another. Homework for the next few days will be a review of fluency from Mod 1.

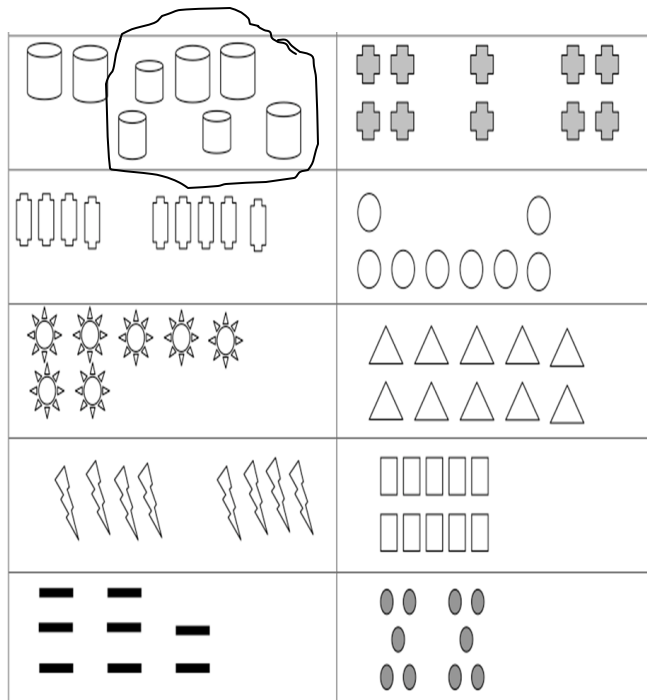


Each rectangle shows 6 objects. Circle 2 different sets within each. The first one is done for you.

Lesson 14

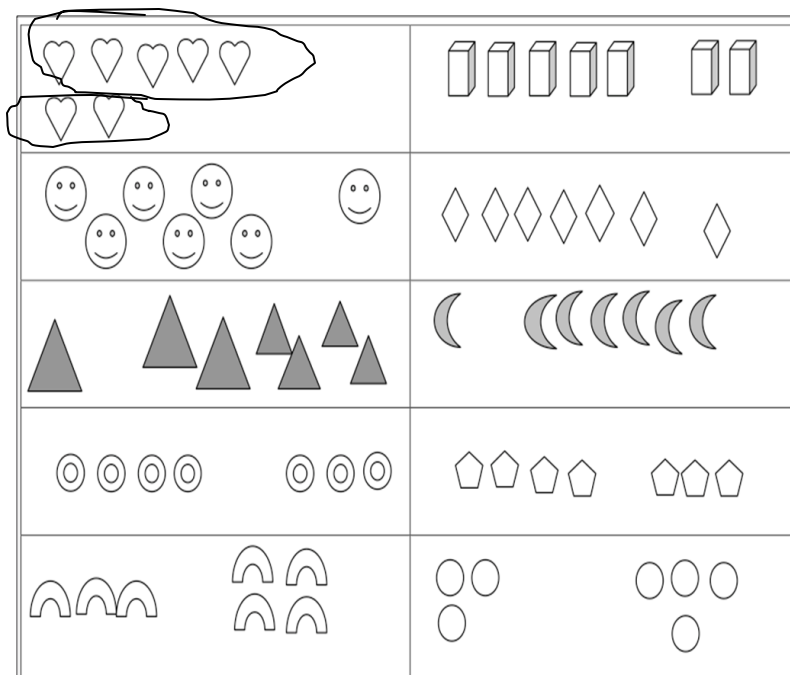
Objective: Explore conservation of volume by pouring.

Within each rectangle, make one set of 6 objects. The first one is done for you.



Lesson 15

Objective: Compare using *the same as* with units.

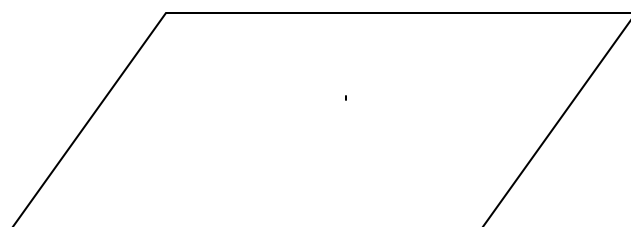


Circle 2 sets within each set of 7. The first one is done for you.

Lesson 16

Objective: Make informal comparison of area.

Cover the shape with pennies. Count how many pennies fit inside the shape and write that number in the box.

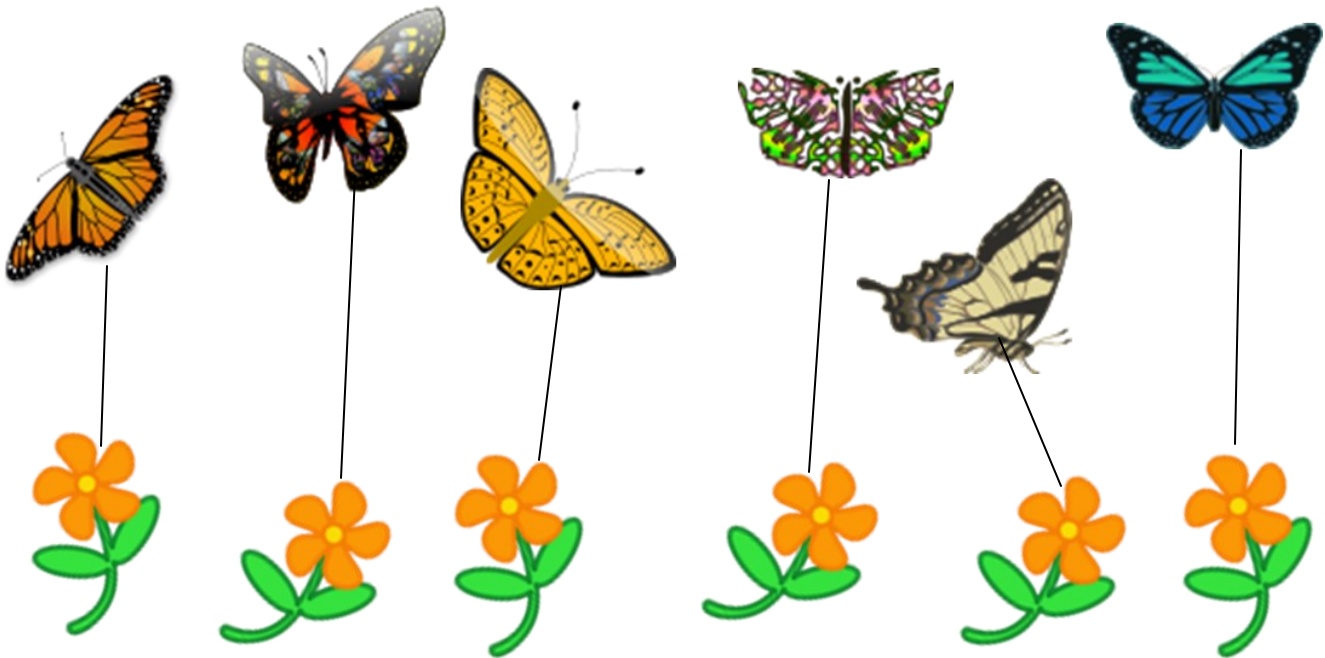


Pennies

Lesson 17

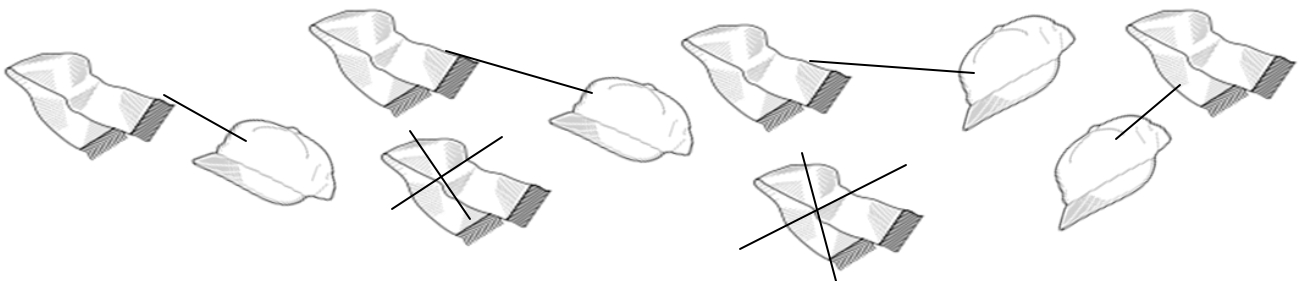
Objective: Compare to find if there is enough.

Draw a straight line with your ruler to see if there are enough flowers for the butterflies.



Lesson 18

Objective: Compare using *more than* and *the same as*.



Draw a straight line with your ruler to see if there are enough hats for the scarves.

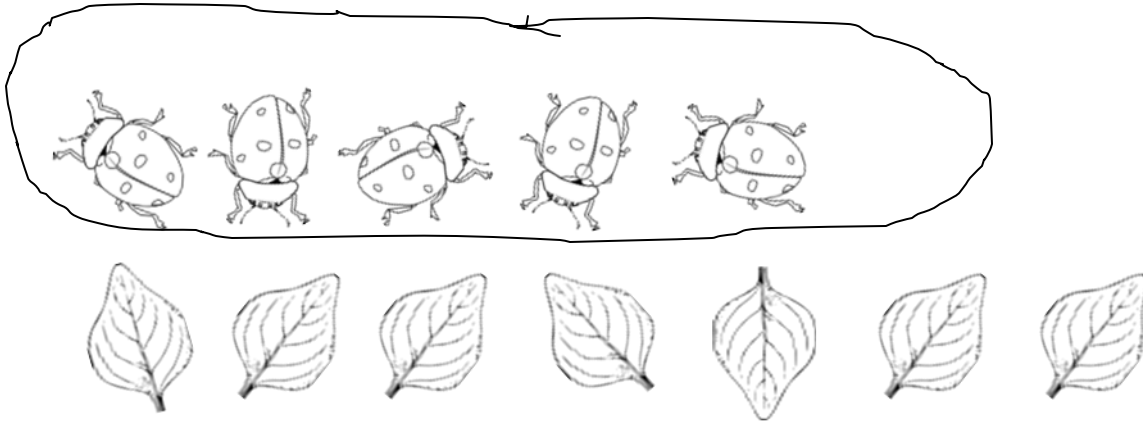
Are there more hats or scarves ? There are more scarves.

Put an X on 2 scarves. Talk to your partner about what you notice now.

Lesson 19

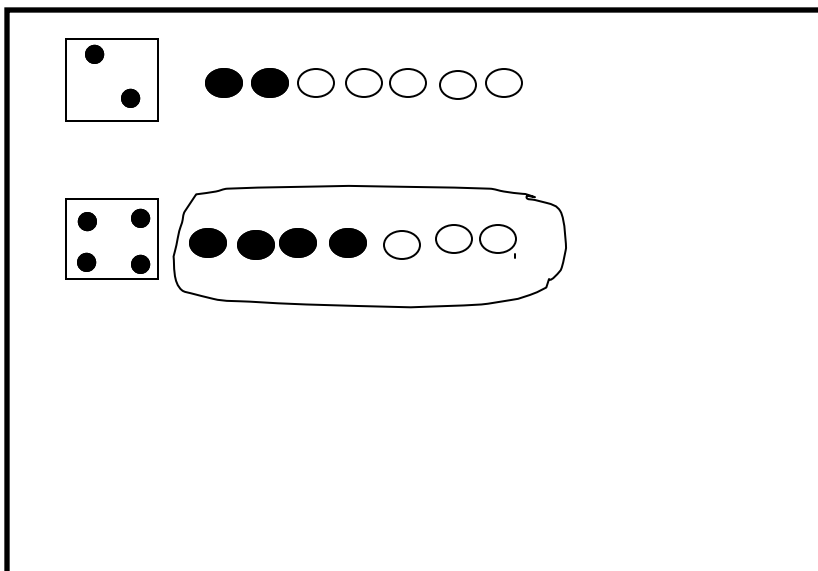
Objective: Compare using *fewer than* and *the same as*.

Count the objects. Circle the set that has fewer.



Lesson 20

Objective: Relate *more* and *less* to length.

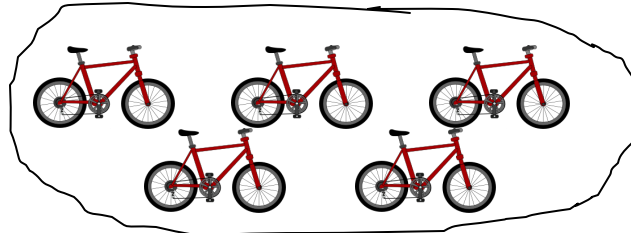
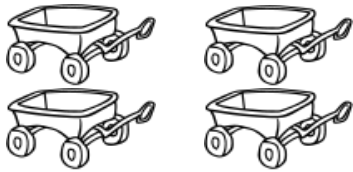




Count the dots on the die.
Color as many beads as
the dots on the die. Circle
the longer chain of beads
that are colored in.

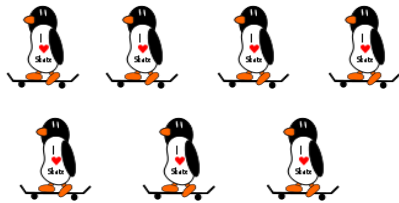
Lesson 21

Objective: Compare sets informally using *more*, *less*, and *fewer*.

Which has more?  or  ?



Which has fewer?  or  ?



Lesson 22

Objective: Identify and create a set that has the same number of objects.

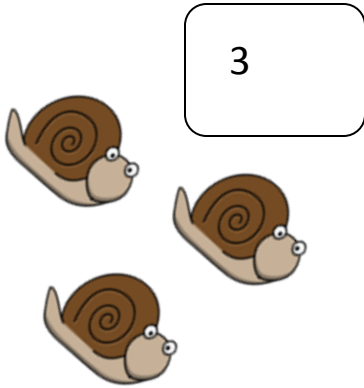
Count the objects in the box. Then, draw the same number of circles in the empty box.



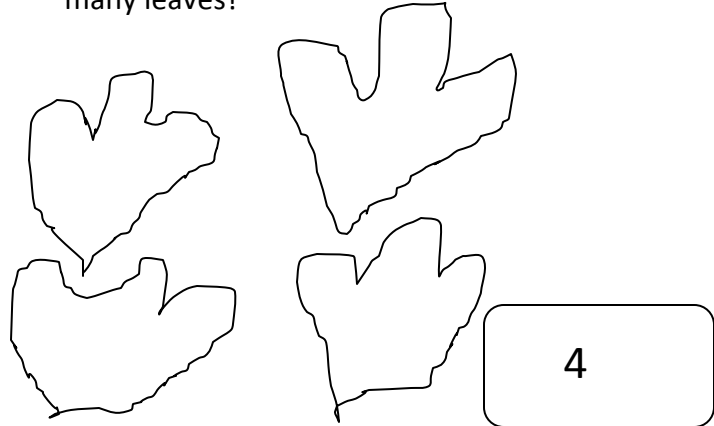
Lesson 23

Objective: Reason to identify and make a set that has 1 more.

How many snails?



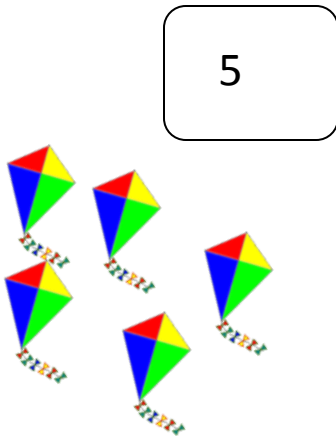
Draw 1 leaf for every snail and 1 more. How many leaves?



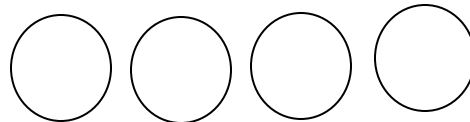
Lesson 24

Objective: Reason to identify and make a set that has 1 less.

How many kites?



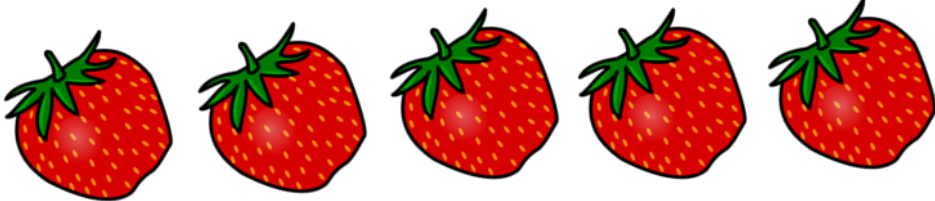

Draw a set of suns that has 1 less. How many suns?



Lesson 25

Objective: Match and count to compare a number of objects. State which quantity is more.

Count the objects in each line. Write how many in the box. Then, fill in the blanks below. Use your words *more than* to compare the numbers.



3

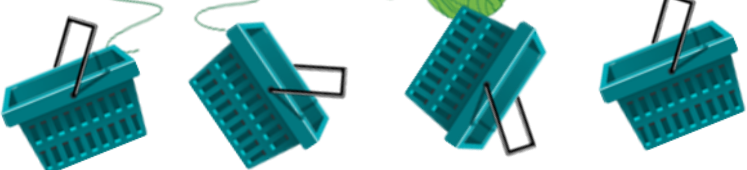

5

_____ 5 _____ is more than _____ 3 _____.

Lesson 26

Objective: Match and count compare two sets of objects. State which quantity is less.

Count the objects in each line. Write how many in the box. Then, fill in the blanks below. Use your words *less than* out loud as you work.



6

4

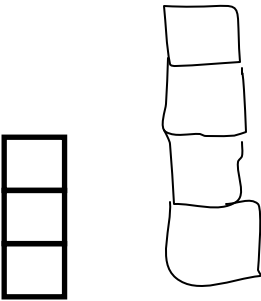
_____ 4 _____ is less than _____ 6 _____.

Lesson 27

Objective: Strategize to compare two sets.

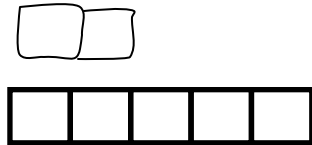
Draw a tower with more cubes.

___4___ is more than
___3___.



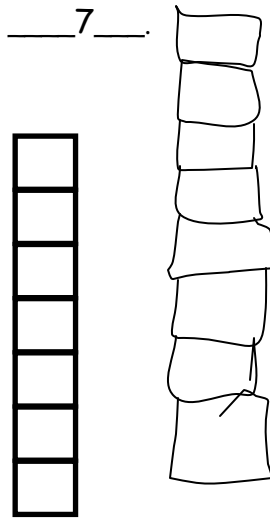
Draw a train with fewer cubes.

___2___ is less than
___5___.



Draw a tower with more cubes.

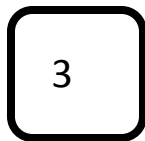
___8___ is more than
___7___.



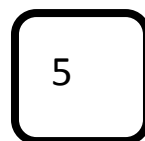
Lesson 28

Objective: Visualize quantities to compare two numerals.

Visualize the number in Set A and Set B and fill in the sentences.



Set A



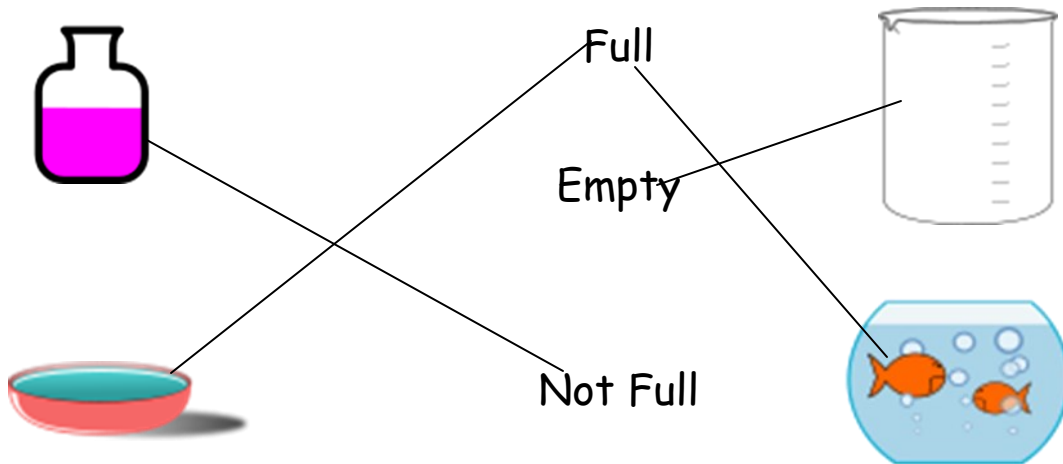
Set B

___5___ is more than ___3___.

___3___ is less than ___5___.

Lesson 29

Objective: Observe cups of colored water of equal volume poured into a variety of container shapes.



Lesson 30

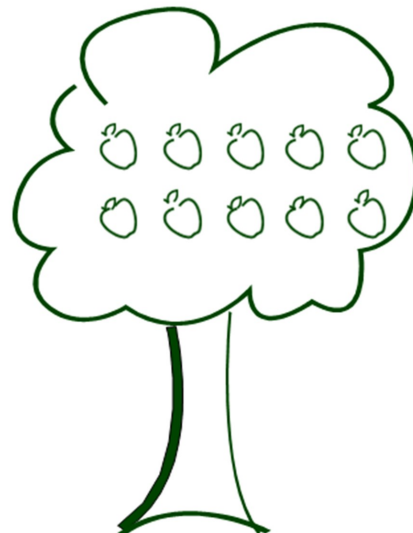
Objective: Use balls of clay of equal weights to make sculptures.

In class we used balls of clay that weigh the same amount on the balance scale to make different sculptures. Students see that the same amount of clay can take various forms without changing the weight. Today's homework is a review of fluency from Module 3.

Color 4 apples on the tree and fill in the blanks.

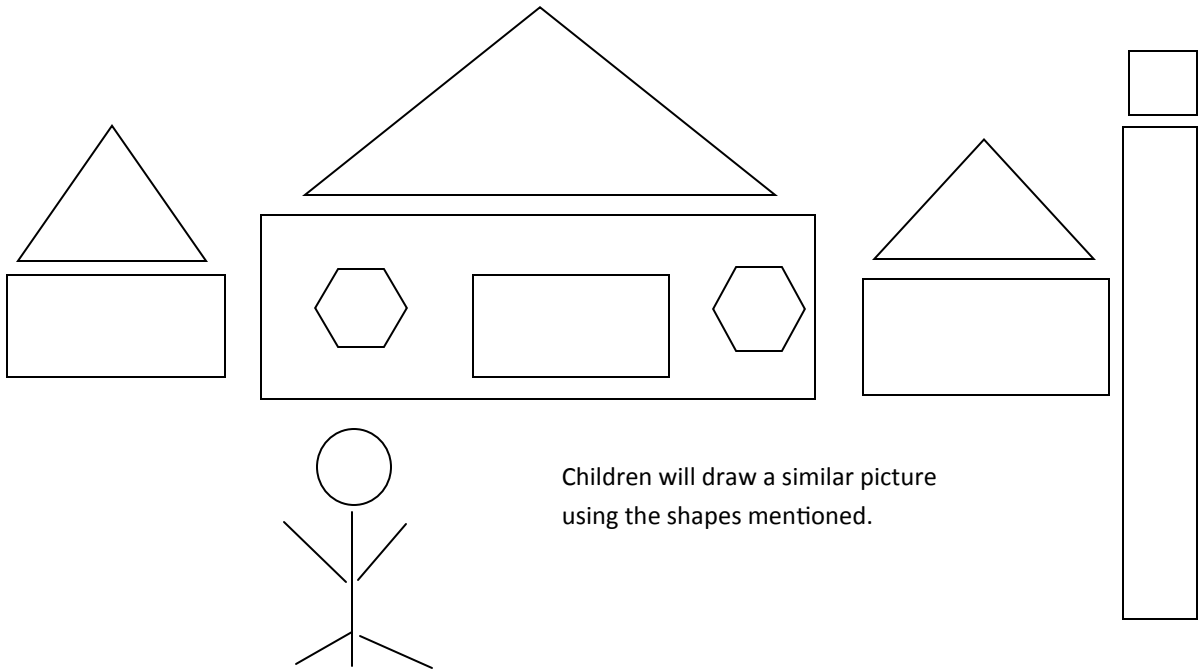
I colored 4 apples.

I need to color 6 more apples to make 10.



Lesson 31

Objective: Use benchmarks to create and compare rectangles of different lengths to make a city.

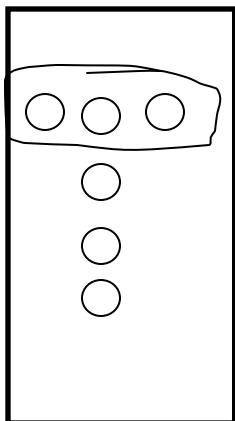


Lesson 32

Objective: Culminating task—describe measurable attributes of single objects.

The homework is a review of fluency skills from Module 3.

Circle a group of dots, then fill in the blanks to make a number sentence.



_____ 3 _____ and _____ 3 _____ is _____ 6 _____.