11 Balance scale

Materials for the lesson and homework: a couple of regular pencils, an eraser, a pencil sharpener; a balance scale and a set of small metric weights; green, red, and yellow pencils in addition to the standard ones.

Warm-up

Problem 11.1 *Alice has two more sisters than brothers. How many more girls than boys are there in the family?*

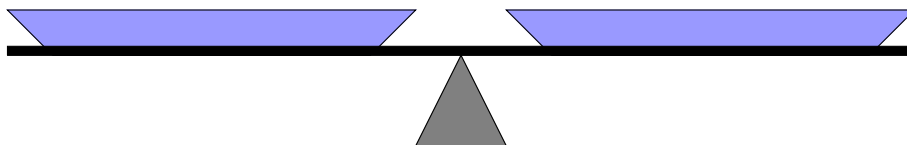*There are _____ more girls than boys in the family.*

Lesson

In this lesson, you will be asked to draw watermelons, mangoes, and pumpkins on balance scales. Please use a green pencil to draw watermelons, red pencil to draw mangoes, and yellow pencil to draw pumpkins. Use a regular pencil to draw weights.

A balance scale is a device for comparing weights very similar to a see-saw at a children's playground. You put two weights on the scales' plates. If the weights are equal, the scale remains in balance. If the weights are different, the lighter weight goes up.

Problem 11.2 *Use a balance scale and a set of weights to find the weight of your eraser and pencil.*

Problem 11.3 *Two watermelons of equal weight are put on one plate of a balance scale. The watermelons are balanced by an 8-pound weight on the other plate.*

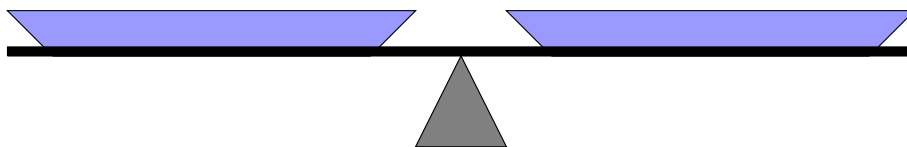- *Draw the watermelons and the weight on the balance scale below.*

- *What is the weight of one watermelon?*

The weight is _____ lbs.

Problem 11.4 *Three mangoes weigh the same as two mangoes and a pound.*

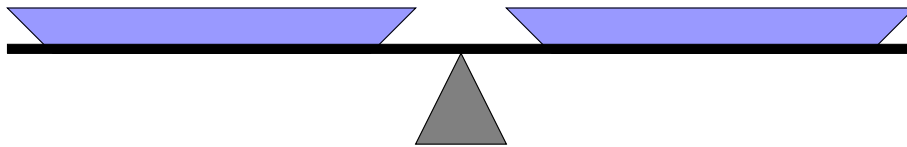- *Draw the mangoes and the 1 lb weight on the balance scale below.*

- *All the mangoes have the same weight. What is the weight of one mango?*

The weight of one mango is _____ lb.

Problem 11.5 *Three pumpkins weigh the same as one pumpkin and six pounds.*

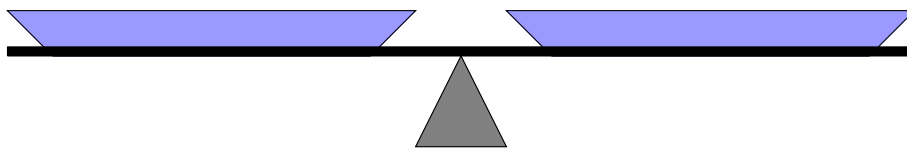- *Draw the pumpkins and the weight on the balance scale below.*

- *All the pumpkins have the same weight. What is the weight of one pumpkin?*

The weight of one pumpkin is _____ lbs.

Fill the table below based on your solutions to problems 11.3, 11.4, and 11.5. You will need the table for subsequent problems.
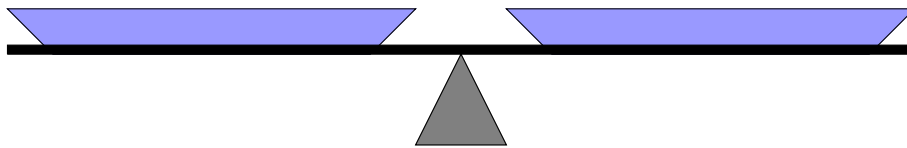
Fruit	mango	watermelon	pumpkin
Weight in lbs			

Problem 11.6 *Bob puts eight mangoes on one plate of a balance scale. How many watermelons does he need to balance the scale? Draw the mangoes and melons on the balance scale below, then answer the question.*

Bob needs _____ melons.

Problem 11.7 *Cindy puts three pumpkins on one plate of a balance scale. She has a 5 lbs weight on the other plate. How many mangoes should Cindy add to this plate to balance the scale? Draw the pumpkins, mangoes, and the 5 lbs weight on the balance scale below, then answer the question.*

Cindy should add _____ mangoes.

Problem 11.8 *The weight of a melon equals the weight of a half of the melon and of three mangoes. What is the weight of the melon?*
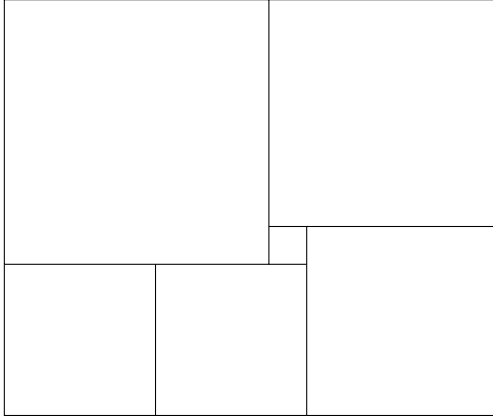
The weight is _____ lbs.

Problem 11.9 *The weight of a coconut equals the weight of a third of the coconut plus 2 lbs. What is the weight of the coconut?*

The weight is _____ lbs.

Problem 11.10 *There are 24 lbs of sand in a bag. Given a balance scale without weights and a bunch of empty bags, how do you fill one of the extra bags with 9 lbs of sand?*

Problem 11.11 *Out of eight identically looking coins, one is a fake. The fake coin is lighter than the real ones. Using a balance scale, find the fake in two weighings.*

Problem 11.12 ❯ *The rectangle below is built of squares. Find the side length of the largest square, if the side length of the smallest square equals one.*

Homework

Finish all the problems unfinished in class.