



GRADE 1 SUPPLEMENT

Set D4 Measurement: Weight in Non-Standard Units

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Skills & Concepts

- ★ use non-standard units to measure the weight of objects
- ★ use non-standard units to compare objects according to their weight
- ★ recognize that objects used to measure weight must be consistent in size
- ★ describe the connection between the weight of the measurement unit and the number of units needed to weigh something
- ★ group and count objects by tens

Bridges in Mathematics Grade 1 Supplement

Set D4 Measurement: Weight in Non-Standard Units

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Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

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Set D4 ★ Activity 1



ACTIVITY

Weigh & Compare

Overview

Students share what they understand about the term “weight”, and then work together to measure and compare the weights of several pairs of objects. The materials can then be set up as a Work Place.

Skills & Concepts

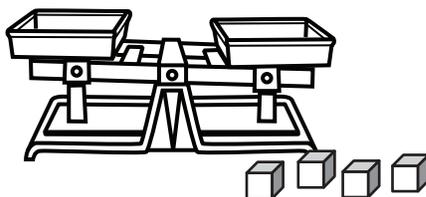
- ★ use non-standard units to measure the weight of objects
- ★ use non-standard units to compare objects according to their weight
- ★ recognize that objects used to measure weight must be consistent in size

You'll need

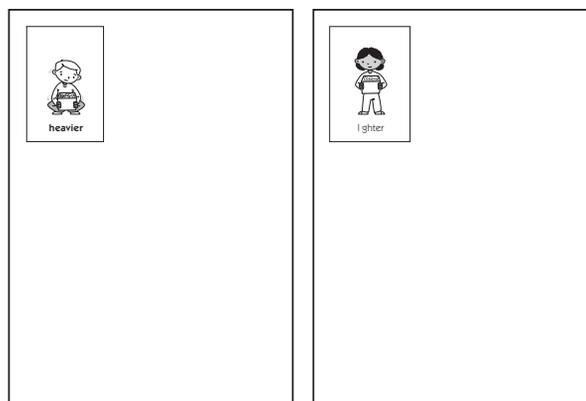
- ★ Weight Comparison Labels (page D4.4, run 1 copy, see Advance Preparation)
- ★ 12 common household objects or classroom items (see Advance Preparation)
- ★ adhesive labels (see Advance Preparation)
- ★ a grocery sack or gift bag
- ★ 1" wooden cubes
- ★ 2 pieces of 12" × 18" construction paper
- ★ a balance scale

Instructions for Weigh & Compare

1. Gather children to your discussion circle. Show them the balance scale and the wooden cubes, and explain that you're going to use them to do some weighing activities today. Ask students to pair-share some of the things they already know about scales and weight. Then call on volunteers to share their ideas with the class.



Advance Preparation Run 1 copy of the Weight Comparison Labels. Cut the labels apart and glue each to a 12" × 18" piece of construction paper. Gather 12 objects of varying weights (e.g., building block, small ball, box of crayons, plastic toy, whiteboard eraser, small book, stuffed animal, can of soup, toy truck, pair of scissors, paperweight, cup). Use a permanent ink marker to write the name of each object on an adhesive label and stick the labels on the objects. Then place all 12 objects in a grocery sack or gift bag.



Activity 1 Weigh & Compare (cont.)

Students *That scale shows how heavy stuff is.*

We used one of those last year. You can put something on each side. The one that's heavier will hang down more.

If you put a cube on each side, the pans will hang the same I bet.

Weight is how heavy something is. I weigh 45 pounds on my scale at home.

2. Next, show students the bag of objects. Pull one of the objects out of the bag and hold it in your hand. Pick up a handful of wooden cubes in your other hand. Adjust the number of cubes until they feel about equal in weight to the object. Then place the object on one side of the scale, and the cubes in the other. Do the two sides balance? If not, what do the students suggest you do?

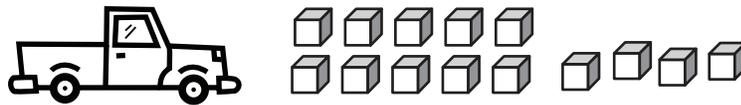
Students *The cubes are pulling down more than the little truck!*

Take some of the cubes out so that side is lighter!

You could put some cubes in with the truck to make it heavier!

Teacher *I could, but I want to use the cubes to measure the weight of the truck. That means I need to find out how many cubes it takes to balance the truck. James, you suggested taking some of the cubes out. Would you come up and try that?*

3. Once the two sides are balanced, dump the cubes out and count them with the students. What does this tell them about the truck?



Students *That truck is pretty heavy!*

It doesn't seem very heavy to me.

It's the same as 14 cubes.

4. Move the object and cubes to the side, and pull a second object out of the bag. Ask the students to predict whether it is heavier or lighter than the first object. What can they do to find out? Chances are, some children will suggest that you compare the two objects directly by holding one in either hand or placing them on either side of the balance scale. Help them transition to measuring rather than comparing directly by asking how you might use the cubes to help with this job.

Teacher *It's true that we could compare the weights of these two objects by putting one on either side of the balance scale. Can you think of a way to compare their weights without doing that? How could we use the cubes to help?*

Students *I already know the ball is heavier than the truck. I can just tell.*

You could use your hands to feel which one is heavier.

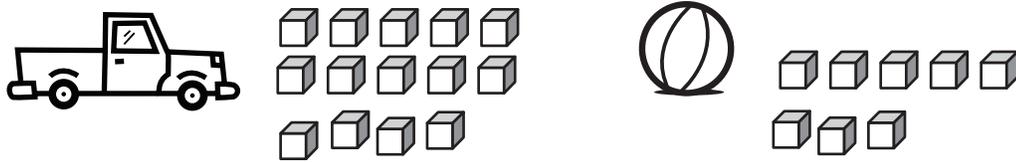
I know! Put the book on one side and find out how many cubes it takes to make it balance.

Yeah! If it's more cubes for the book, that means the book is heavier.

5. Place the second object on one side of the scale and call on a volunteer to balance the other side with cubes. Then dump the cubes out and count them with the class. How does this quantity compare with

Activity 1 Weigh & Compare (cont.)

the number of cubes it took to balance the first object? What does this tell you about the weights of the two objects?



Students *The ball is only 8 cubes.
The truck takes more cubes. It's heavier!
It's 6 more cubes for the truck—I counted them.*

6. Talk with the students about the fact that the cubes are all the same size and weigh the same. Why is this important? Would it be fair if you weighed one of the objects with heavier cubes? Why not? Would you be able to tell how the weights of the two objects compared if you used a collection of cubes that were many different sizes and weights? Why not? The idea that units of measure must be uniform may be new to most students, but is important, and is a concept children can start to understand in the context of this activity.

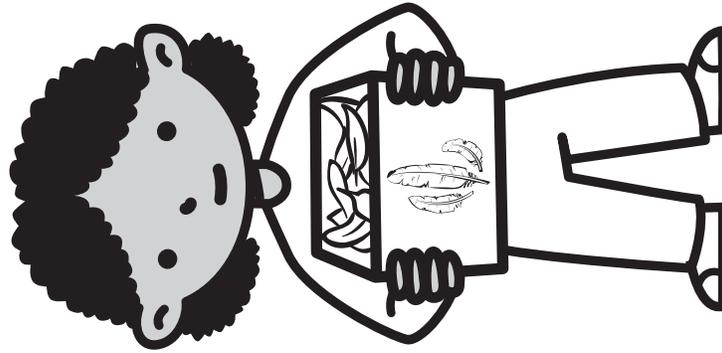
7. Show students the weighing mats you've prepared and place each object on the appropriate mat.

8. Repeat steps 2–5 with two more pairs of objects from the sack, reinforcing the concepts of measurement you've just introduced.

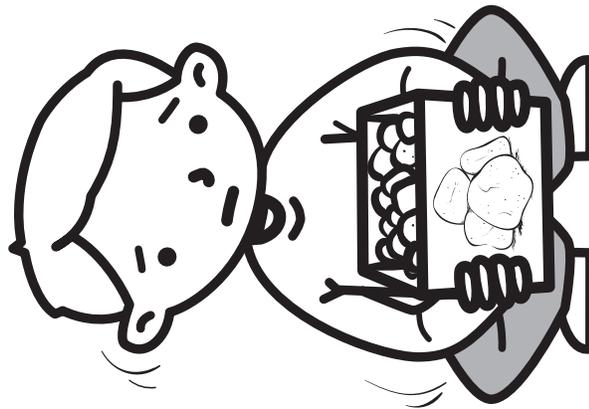
Extension

- Return the objects to the sack. Set up the sack, the balance scale, the weighing mats, and the cubes as a Work Place and ask students to revisit the activity on their own.

Weight Comparison Labels



lighter



heavier

Set D4 ★ Activity 2



ACTIVITY

Estimate & Check the Weight

Overview

The class works together to estimate and check the weight of three different objects, using wooden cubes and a balance scale. Then they use the information to compare and order the objects by weight. Students revisit the activity on their own during Work Places.

Skills & Concepts

- ★ use non-standard units to estimate and measure the weight of objects
- ★ use non-standard units to compare objects according to their weight
- ★ recognize that objects used to measure weight must be consistent in size

You'll need

- ★ Estimate & Check the Weight Record Sheet (page D4.7, run a class set and cut in half)
- ★ 12 common objects in a grocery sack or gift bag from Set D4, Activity 1
- ★ 1" wooden cubes
- ★ a balance scale
- ★ a pencil and a hard writing surface for each student

Instructions for Estimate & Check the Weight

1. Post a copy of the record sheet on an easel or the whiteboard by your discussion area and place the bag of objects, the wooden cubes, and the scale within easy reach. Ask children to each get a pencil and something hard to write on, such as a book or an individual whiteboard, and join you in the circle. As they bring their materials to the discussion area, give them each a copy of the Estimate and Check record sheet, and have them write their name on it. Explain that you're going to do a new weighing activity together.
2. Ask a volunteer to choose an object from the bag. Have students record the name of the object and an estimate of how much it weighs on their record sheets as you do so on your copy of the record sheet.

Set D4 Measurement: Weight in Non-Standard Units Blackline Run a class set and cut in half

NAME Mr. Gomez DATE _____

Estimate & Check the Weight Record Sheet

Object	Estimate	Check
cup	8 s	_____ s
	_____ s	_____ s
	_____ s	_____ s
Which is heaviest?		
Which is lightest?		

Activity 2 Estimate & Check the Weight (cont.)

3. Choose another volunteer to find the actual weight of the object by placing wooden cubes on the other side of the scale until the two sides balance. Dump the cubes out and count them with the children. Then record the number on your record sheet as students do so on theirs. Work with the children to determine the difference between your estimate and the actual weight of the object.

Teacher *I estimated that the cup would weigh 8 cubes. How much did it actually weigh?*

Students *It was really 11 cubes.*

That's what I guessed!

I thought it would be 10. That's really close.

Teacher *How far off was I on my estimate? How much more is 11 than 8?*

Students *It's 3 more. I know because it's 9, 10, 11.*

I said 3 because 8 and 2 is 10, and then 1 more is 11.

4. Ask a third volunteer to choose a second object from the bag. Record the name of the object on your record sheet as students do so on theirs. Challenge students to use what they know about the weight of the first object to help estimate the weight of the second.

Students *If you put the cup and the teddy bear in your hands, you can feel which one is heavier.*

Can I try? If the teddy is lighter, then it won't be as many cubes.

5. Implement some of the students' suggestions. Then ask students to record their estimates as you do so on your record sheet. Call on a fourth volunteer to weigh the second object with cubes. Dump the cubes out, count them with the class, and have them record the answer on their sheets. Then pose the following questions:

- Which of these 2 objects is heavier? Which is lighter?
- How do you know?
- How much heavier is the _____ than the _____?
- Why is it important that all our cubes are the same size and weight? Would it be fair if we weighed one object with heavier cubes? Why not?

6. Call on a different volunteer to pull a third object out of the bag. Work with the class to estimate and check its weight in cubes. Discuss the questions at the bottom of the record sheet. Use the information you've gathered to fill in the answers as students do so on their own sheets.

7. Return the objects to the sack. Set up the sack, the balance scale, the cubes, and a class set of the record sheets as a Work Place. Ask student pairs to revisit the activity at least once on their own over the next few weeks.

NAME _____

DATE _____

Estimate & Check the Weight Record Sheet

Object	Estimate	Check
	_____  's	_____  's
	_____  's	_____  's
	_____  's	_____  's
Which is heaviest?		
Which is lightest?		

NAME _____

DATE _____

Estimate & Check the Weight Record Sheet

Object	Estimate	Check
	_____  's	_____  's
	_____  's	_____  's
	_____  's	_____  's
Which is heaviest?		
Which is lightest?		

Set D4 ★ Activity 3



ACTIVITY

Weigh It Twice

Overview

What will happen if you weigh the same object twice, once with wooden cubes, and once with Unifix cubes? Students explore this idea together, and then revisit the activity on their own during Work Places.

Skills & Concepts

- ★ use non-standard units to estimate and measure the weight of objects
- ★ use non-standard units to compare objects according to their weight
- ★ recognize that objects used to measure weight must be consistent in size
- ★ describe the connection between the weight of the measurement unit and the number of units needed to weigh something
- ★ group and count objects by tens

You'll need

- ★ Weigh It Twice Record Sheet (page D4.11, run a class set and cut in half)
- ★ 12 common objects in a grocery sack or gift bag from Set D4, Activity 1
- ★ 1" wooden cubes
- ★ Unifix cubes
- ★ a balance scale
- ★ a pencil and a hard writing surface for each student

Instructions for Weigh It Twice

1. Post a copy of the record sheet on an easel or the whiteboard by your discussion area and place the bag of objects, the wooden cubes, the Unifix cubes and the scale within easy reach. Ask children to each get a pencil and something hard to write on, such as a book or an individual whiteboard, and join you in the circle. As they bring their materials to the discussion area, give them each a copy of the Weigh It Twice record sheet, and have them write their name on it.

2. Choose one of the objects from the bag. Place it on one side of the scale, and put as many wooden cubes on the other side as needed to balance the two sides. Dump the cubes out and count them with the class. Record the result on your record sheet as students do so on theirs. Set the wooden cubes to the side and place the object back on the scale. Pose the following questions:

- What will happen if we weigh this object again with Unifix cubes instead of wooden cubes?
- Will it take more Unifix cubes or fewer to balance the scale?
- How do you know?

3. After some discussion, weigh the object with Unifix cubes. Dump the cubes out and work with input from the students to group and count them by tens and ones. Was the result the same as when you weighed the object with wooden cubes? Did it take more Unifix cubes or fewer? Why?

Activity 3 Weigh It Twice (cont.)

Students *It took way more Unifix cubes!*
It was only 8 wood cubes and 34 of the Unifix cubes.
It's because those Unifix cubes are smaller.
It's like I said! It takes more because they're not as heavy.
Yeah! You really have to put a lot in.
It's because they're made out of plastic. Wood is heavier.

4. Record the results on your sheet as students do so on theirs.

Set D4 Measurement: Weight in Non-Standard Units Blackline Run a class set and cut in half

NAME Greg DATE _____

Weight it Twice Record Sheet

Object	How many Cubes?	How many unifix Cubes?
crayons	8 	34 
		
		
Which is heaviest?		
Which is lightest?		

5. Repeat steps 2–4 twice more. Continue to explore the idea that the weight of the unit affects the number of units needed to weigh an object. As you work together, ask students to think about which of the two units is more accurate. Is it easier to get the scale exactly balanced with the wooden cubes or the Unifix cubes? Why?

6. Discuss the questions at the bottom of the record sheet. Use the information you've gathered to fill in the answers as students do so on their own sheets.

7. Return the objects to the sack. Set up the sack, the balance scale, the wooden cubes, the Unifix cubes, and a class set of the record sheets as a Work Place. Ask student pairs to revisit the activity at least once on their own over the next few weeks.

NAME _____

DATE _____

Weight it Twice Record Sheet

Object	How Many Cubes?	How Many Unifix Cubes?
	_____  's	_____  's
	_____  's	_____  's
	_____  's	_____  's
Which is heaviest?		
Which is lightest?		

NAME _____

DATE _____

Weight it Twice Record Sheet

Object	How Many Cubes?	How Many Unifix Cubes?
	_____  's	_____  's
	_____  's	_____  's
	_____  's	_____  's
Which is heaviest?		
Which is lightest?		

