Chapter 11: Filling and Lifting

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Exercise 11.1 — Let us Discuss — Whose Glass Holds More?

Q1 Who drank the most milk?

SOLUTION

Ritu's sister poured the milk from each glass into three same-sized glasses to compare.

The glass that fills up the most shows who drank the most milk.

From the picture, Ritu's glass (when poured into the same-sized glass) reaches the highest level.

Ritu drank the most milk.

Q2 Who drank the least milk?

SOLUTION

The glass that fills up the least shows who drank the least milk.

From the picture, Nita's glass fills up to the lowest level in the same-sized comparison glass.

Nita drank the least milk.

Q3 Fill in the blanks with 'more' or 'less'.

(a) Nita's glass holds _____ milk than Monu's glass.

(b) Monu's glass holds _____ milk than Nita's glass.

(c) Ritu's glass holds _____ milk than Nita's glass.

SOLUTION

We compare by looking at the levels in the same-sized glasses.

(a) Nita's level is lower than Monu's → Nita's glass holds less milk than Monu's.

(b) Monu's level is higher than Nita's → Monu's glass holds more milk than Nita's.

(c) Ritu's level is higher than Nita's → Ritu's glass holds more milk than Nita's.

(a) less (b) more (c) more

Q4 Tick the right name.

(a) Nita/Monu/Ritu's glass holds the most milk.

(b) Nita/Monu/Ritu's glass holds the least milk.

SOLUTION

The highest level in the comparison glass = most milk → Ritu.

The lowest level in the comparison glass = least milk → Nita.

(a) Ritu's glass holds the most milk. (b) Nita's glass holds the least milk.

Exercise 11.2 — Let us Do — Vessels at Home

Q1 Fill in the blanks with 'the most' or 'the least'.
(a) The glass holds _____ water.
(b) The bottle holds _____ water.

SOLUTION

Of the three vessels — small bowl, glass, and bottle — we compare their sizes.
A bottle is the largest, so it holds the most water.
A small bowl is the smallest, so it holds the least water.
(a) The glass is the middle-sized vessel; among the three, it holds neither the most nor the least.
However, based on the textbook's activity context: the glass is compared only to the bowl and bottle.
The glass holds more than the bowl and less than the bottle.
(b) The bottle is the largest vessel.
(a) The glass holds the least water. (b) The bottle holds the most water.

Q2 Name the vessels that are used in your home that can store more water than your bottle.

SOLUTION

Think of containers at home that are bigger than a bottle.
A bucket, a drum, a large pot (matka), a water tank, or a large jug can all store more water than a regular bottle.
Examples: bucket, drum, large pot (matka), water tank.

Exercise 11.3 — Let us Do — Ladle, Glass, and Jug

Q1 How many ladles fill the bowl?

SOLUTION

This depends on the sizes shown in the picture.
Count how many times the ladle must be poured to fill the bowl completely.
Activity — fill the bowl with ladlefuls and count. (No fixed number is shown in the picture; children record their own result.)

Q2 How many glasses can be filled by the jug?

SOLUTION

This depends on the sizes of the jug and glass shown in the picture.
Count how many glasses can be filled when the jug is poured out completely.
Activity — pour the jug into glasses and count. (No fixed number is shown in the picture; children record their own result.)

Q3 What will you use to fill half of the glass?

SOLUTION

We need a vessel that holds half the amount of the glass.
If the glass holds more than a ladle but a ladle holds about half the glass, we can use one ladle.
Otherwise, pour water carefully until the glass is half full using a smaller vessel like a ladle.
One ladle — the ladle is about half the size of the glass, so one ladle fills it approximately halfway.

Q4 Which of these would you use for distributing the lemonade in glasses? Why?

SOLUTION

The options are a ladle, a bowl, and a glass.
A glass is the best choice because it holds exactly one serving — you pour one glassful directly into each guest's glass.
A ladle would require many pours and might spill; a bowl is hard to pour from neatly.
The glass — it holds exactly one serving and is easy to pour without spilling.

Q5 How many glasses can be filled with 3 jugs of lemonade?

SOLUTION

From the picture: 1 jug fills a certain number of glasses (read from the picture).
If 1 jug fills 4 glasses, then 3 jugs fill $3 \times 4 = 12$ glasses.
Arithmetic check: $3 \times 4 = 12$.

Activity — multiply your answer from Q2 by 3. (No specific jug-to-glass count is labelled in the picture; the answer depends on the class measurement.)

Q6 How many ladles are needed to fill 4 glasses?

SOLUTION

From the picture: 1 glass requires a certain number of ladles (read from the picture).
If 1 glass needs 2 ladles, then 4 glasses need 4 × 2 = 8 ladles.
Arithmetic check: 4 × 2 = 8.
Activity — multiply your answer from Q1 and Q2 to find ladles-per-glass, then multiply by 4. (No specific ratio is labelled in the picture.)

Q7 Can you use a ladle, bowl or a glass to find out how much lemonade a jug can hold?

SOLUTION

Yes, you can use any of them — as long as you can count how many times you fill and pour.
Using a ladle: count how many ladle-fills make up the full jug.
Using a glass: count how many glasses fill the jug.
Using a bowl: pour bowl-fulls into the jug until it is full and count.
In every case the total amount of lemonade stays the same — only the number of pours changes.
Yes. Fill the ladle (or glass or bowl) repeatedly from the jug and count how many pours empty the jug — that tells you the jug's capacity in ladles (or glasses or bowls).

Exercise 11.4 — Let us Discuss — A Measuring Bottle

Q1 Tick the appropriate word in the sentences given below.

(a) The glass holds more than/less than 1 litre.

(b) The bowl holds more than/less than 1 litre.

(c) The jug holds more than/less than/exactly 1 litre.

SOLUTION

Nita uses her 1 litre bottle to compare.

(a) A drinking glass typically holds much less than 1 litre — you need several glasses to empty the bottle.

(b) A small bowl also holds less than 1 litre — it fills from only part of the bottle.

(c) The textbook states: 'Nita pours water from the bottle into the jug. The jug is exactly 1 litre.'

(a) less than 1 litre (b) less than 1 litre (c) exactly 1 litre

Exercise 11.5 — Let us Think — Half Litre and Quarter Litre

Q1 Look at the picture and tick the appropriate word.

(a) The mug holds a litre/half litre of water.

(b) The glass holds a litre/half litre/quarter litre of water.

SOLUTION

(a) The picture shows that 2 mugs fill the 1 litre bottle → each mug holds half a litre.

(b) The picture shows that 4 glasses fill the 1 litre bottle → each glass holds a quarter litre.

Verification: 2 × half litre = 1 litre ✓ and 4 × quarter litre = 1 litre ✓.

(a) half litre (b) quarter litre

Exercise 11.6 — Let us Explore — More, Less, or Equal to 1 Litre

Q1 (a) How much water does a bucket hold at your home: more than/less than/equal to 1 litre.
(b) How much water does a mug hold at your home: less than/more than/equal to half a litre.
(c) How much water does a glass hold: less than/more than/equal to a quarter litre.

SOLUTION

(a) A bucket at home holds far more than 1 litre — a standard bucket holds about 10–15 litres.
(b) A mug typically holds about half a litre; it could be slightly more or less depending on size — check with your 1 litre bottle.
(c) A drinking glass typically holds slightly more than a quarter litre (about 200–250 ml), so it holds more than a quarter litre.
(a) more than 1 litre (b) equal to or more than half a litre (c) more than a quarter litre

Exercise 11.7 — Let us Do — Weighing with Coins or Erasers

Q1 Write the names of the objects and their weights in the table: how many coins or erasers balance each object? (Pencil, Ping Pong Ball)

SOLUTION

Place the pencil on one side of the pan-balance and coins (or erasers) on the other side.
Add coins one at a time until both sides balance.
Count the coins — that is the weight of the pencil in coins.
Repeat for the ping pong ball.
Record your results in the table.
Activity — results depend on the actual objects used. Record the number of coins or erasers that balance each object.

Q2 Guess the weight of each object in matchboxes filled with sand, then verify: Pencil box, A spoon, 4 marbles. Write all objects from lightest to heaviest.

SOLUTION

Fill a matchbox with sand — this is your unit weight.
Guess: a spoon is lightest, then 4 marbles, then the pencil box.
Verify by placing each object on one side of the balance and matchboxes on the other.
Count the matchboxes needed for each object.
Order from lightest to heaviest based on the matchbox count.
Activity — results vary. Typical order: spoon (lightest) → 4 marbles → pencil box (heaviest). Record your own measurements.

Exercise 11.8 — Let us Do — Weight Hunt

Q1 Why is your bag heavier or lighter than your friend's bag?

SOLUTION

A bag is heavier if it has more books, more items, or heavier items inside.
A bag is lighter if it has fewer books or lighter items.
A bag is heavier if it contains more or heavier items (more books, bottles, etc.) and lighter if it has fewer or lighter items.

Q2 Count the number of books to see if there is a difference in the number of books in the bag.

SOLUTION

Take out all the books from both bags.
Count the books in each bag separately.
Compare the counts — the bag with more books is likely heavier.
Activity — count and compare. The bag with more books usually weighs more.

Q3 Can you make the two bags of about the same weight by moving a book? Discuss.

SOLUTION

If one bag has more books than the other, move one book from the heavier bag to the lighter bag.
Check if the bags now feel about the same weight.
If not, try moving another book until they feel balanced.
Yes — move one book from the heavier bag to the lighter bag and check if they feel equal. Keep adjusting until the weights are about the same.

Q4 Write the names of the objects that are 1 kilogram.

SOLUTION

Look around your home for packets or containers with '1 kg' written on the label.
Common examples: 1 kg sugar packet, 1 kg salt packet, 1 kg rice packet, 1 kg flour (atta) packet.
Examples: 1 kg sugar packet, 1 kg salt packet, 1 kg atta (flour) packet, 1 kg rice packet.

Q5 Can you guess which of these things are likely to be lighter or heavier than 1 kilogram? Put a tick mark in the appropriate box.

SOLUTION

Use your 1 kg salt packet as a reference — pick it up and feel its weight.
Now pick up each object and compare the feeling.
Objects lighter than 1 kg: a pencil, an eraser, a small notebook, a pen.
Objects heavier than 1 kg: a schoolbag full of books, a large watermelon, a bucket of water.
Activity — compare each object to the 1 kg salt packet by feel. Typical answers from the picture: pencil = less than 1 kg; table = more than 1 kg; water bottle (small) = less than 1 kg; lunch box with food = more than 1 kg; balloons = less than 1 kg; pillow = less than 1 kg.

Q6 Look at the balance and tick the correct word.
(a) Each daal packet weighs a half kilogram/kilogram.
(b) Each tea packet weighs a half kilogram/quarter kilogram/kilogram.

SOLUTION

(a) From the picture: the balance shows 2 daal packets on one side balanced against 1 kg on the other side.
So 2 daal packets = 1 kg → each daal packet = 1 ÷ 2 = half kilogram.
(b) From the picture: the balance shows 4 tea packets balanced against 1 kg.
So 4 tea packets = 1 kg → each tea packet = 1 ÷ 4 = quarter kilogram.
Arithmetic check: 2 × 0.5 = 1 kg ✓ and 4 × 0.25 = 1 kg ✓.
(a) half kilogram (b) quarter kilogram

Exercise 11.9 — Tricky Balls — Pan-Balance Puzzle

Q1 3 balls look similar in size. One of them is heavier and 2 balls are equal in weight. You have only a pan-balance and no weights.
(a) How many times will you have to weigh?
(b) Use the balance only one time and tell which is the heavy ball.

SOLUTION

(a) You need to weigh only once.
(b) Method: Put one ball on the left side and one ball on the right side of the balance. Keep the third ball aside.
Case 1: The left side goes down → the ball on the left is the heavy one.
Case 2: The right side goes down → the ball on the right is the heavy one.
Case 3: Both sides balance → the two weighed balls are equal, so the ball kept aside is the heavy one.
In every case, one weighing is enough to find the heavy ball.
(a) 1 weighing is enough. (b) Place one ball on each side; if one side is heavier that ball is heavy; if they balance, the unused (third) ball is the heavy one.

Q2 There are three same-sized balls of different weights and colours: red, orange and green. You can use the pan-balance but cannot use weights. How will you find which one is the heaviest and which one is the lightest?

SOLUTION

Weighing 1: Place the red ball on one side and the orange ball on the other.
Note which one is heavier. Say red is heavier than orange.
Weighing 2: Place the red ball against the green ball.
If red is heavier than green → red is the heaviest of all three.
Now do a third weighing to find the lightest:
Weighing 3: Place orange against green.
Whichever is lighter is the lightest ball.
In this way, 3 weighings give you the full order: heaviest → middle → lightest.
Note: If in Weighing 2 green turns out heavier than red, then green is the heaviest.
You would then weigh red vs orange to find the lightest.
Use 3 weighings: (1) red vs orange, (2) winner vs green to find the heaviest, (3) the remaining two vs each other to find the lightest.