

Topic: Using units of measurement

Making direct comparisons of mass

Lesson concepts



Mass — Language (describing, comparing, ordering)



Mass — Direct comparison

Today students will:

- ▶ make direct comparisons of mass.

Resources

Find and prepare

A suitcase or carry bag

Two objects of similar size and shape but significantly different masses (for example: a tennis ball and a rock or paperweight)

A bag (containing at least six objects with different weights or mass)

A skirt hanger

Two plastic or resealable bags

Key terms

heft, weight, mass, same

For definitions and explanations of terms, please see the [Glossary](#).

Lesson

Introduce the lesson

Note

The following language is important to highlight and develop throughout this lesson.

light, heavy, lighter, heavier, same, length, shape, size, lift, sort

INV

Describe objects, using the terms 'lighter' and 'heavier'

- Assist students to fill a suitcase or carry bag so that it is very heavy.
- When the bag is full, ask students to try a number of ways to move it.
- Discuss the problem, using mathematical language, such as 'lighter' and 'heavier'.
- Assist students to trial different ways of moving the bag.

Focus questions

Q: *What is the problem?*

A: For example, it is too heavy for me to lift.

Q: *What do you need to do?*

A: Make it lighter.

Q: *How will you do that?*

A: Take some items out of the bag.

Q: *How will you know if it is lighter or heavier?*

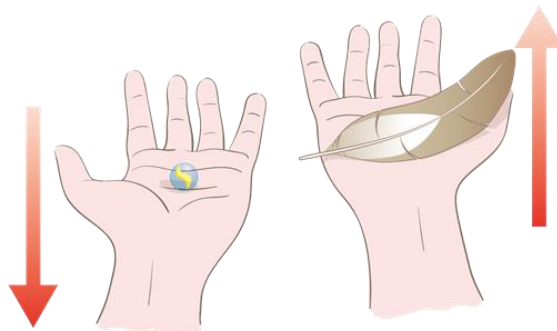
A: It should be easier to lift if it is lighter.

- Ask students to make the bag light enough for them to carry, and explain how they made it lighter.

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Heft to compare mass

- Explain to students that when you hold two objects to find out if they are lighter or heavier, we say that you are '**hefting**'. For example:



- Demonstrate hefting with two objects of similar shape and size but significantly different mass.
- Explain that, when hefting, you:
 - place one object in each hand
 - concentrate carefully
 - move your arms up and down slightly
 - feel and say which is heavier.
- Allow students to practise hefting the objects.
- Ask students to:
 - select two objects from the bag (containing at least six objects with different weights or mass)
 - predict which will be heavier
 - heft the objects
 - sort the objects into piles of lighter and heavier items
 - display their findings, for example: draw and label the items as heavier or lighter.

Focus questions

Q: Which object do you think will be heavier?

Q: Why do you think that?

Q: What happened when you hefted these objects?

A: For example, I could feel that the weight in one hand was more than in the other.

Q: What problems did you notice?

A: For example, it was harder to tell when they were almost the same.

- Ask students if they can tell the mass of an object by how it looks. Discuss with students that the look of an object can sometimes be misleading about its mass.

Represent differences in mass

- Help students to attach the plastic or resealable bags to the skirt hanger.
- Explain to students that they will place objects in the plastic bags to observe the differences in mass.
- Ask students:
 - to find two objects that are different in mass
 - place one in each plastic bag
 - hang the skirt hanger on a hook or doorknob.
- Ask questions to help students to talk about the differences in mass.

Focus questions

Q: *Which object is heavier? Lighter?*

Q: *How do you know?*

Q: *Which way does the skirt hanger tip when the object is heavier?*

A: The hanger will tip down on the side with the heavier object.

Q: *Why do you think that happens?*

A: Because if there is more weight in the bag, it will pull that side down.

RL

- Help students to use sticky notes to label the plastic bags as 'lighter' or 'heavier' and hang them in the room.
- During everyday activities, help students to talk about and compare the mass or weight of objects (for example: when cooking, shopping or setting the table, ask students to use their hands to find out which objects are heavier or lighter).