

**Setting**

*Which Bottle is Best?* is set in Madagascar, a large island country in the region of East Africa. Encourage students to locate Madagascar on a world map, if you have one.

The flag of Madagascar can be seen on the trail marker signs on **page 15**.



Madagascar contains a wide variety of landscapes and geographical features. We have included:

- rock formations (**cover, pages 2-3, 4-5, 6, 12, 15, and 16**)
- baobab trees (**cover, title page, pages 4-5, and 16**)
- rivers (**pages 9, 10, 13, 14, and 16**).

Baobab trees are particularly iconic. Madagascar has six species of baobab, all of which are not found anywhere else in the world. The local name for the largest species of baobab means “mother of the forest”. These giant baobab can grow up to 30 metres tall – about the size of a 10-storey building!



The animals’ clothing is modelled on traditional Malagasy clothing, including colourful, patterned cloth called *lamba*, and straw hats. Traditional clothing like this is more commonly worn in rural areas, while Western clothing is more common in urban areas.

**Characters**

The animals in the story are modelled on species of lemur and chameleon found in Madagascar. Depending on where you are in the world, your students may have seen other lemurs or chameleons in real life or in fiction. Lemurs are particularly associated with Madagascar in popular culture. What makes the animals in the story different from those they have seen before? Consider the size of the animal, colour, markings, eyes (size, shape, colour), ears (size, shape), tail (size, shape, position, thickness), legs (length, width), feet (size, number of toes), etc.



*Ring-tailed lemur*



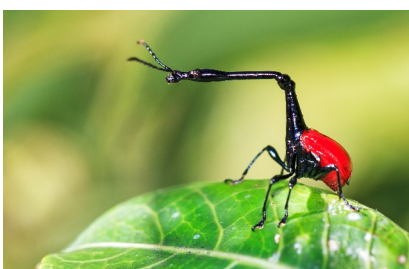
*Panther chameleon*

Madagascar is notable for its unique wildlife. Lemurs are not found anywhere else in the world, and about half of all the chameleon species in the world are found in Madagascar!

The **title page** and **page 8** also feature some insects that are found in Madagascar:



*Hissing cockroach*



*Giraffe weevil*



*Flatid leaf bug*

We are unable to provide photos of the stick insect (*Archrioptera manga*) and dragonfly (*Palpopleura vestita*) because of their rarity. The small yellow beetles are generic, and do not represent a particular Malagasy species. Ask students to brainstorm the most common insects in your location.

### Story

It is important to drink water to keep our bodies hydrated. This is particularly important when exercising, because we lose extra fluid through sweat. On a big walk like the one in the story, when we do not have access to a kitchen, drinking fountain, or store, we can carry water with us in a drink bottle (or “water bottle”). In some countries, students bring drink bottles to school.

Water bottles may be single-use (such as those bought at a convenience store or supermarket) or reusable. Single-use water bottles are usually made from flexible plastic, while reusable water bottles may be made from harder plastic, stainless steel, aluminium, titanium, silicone, glass, or other materials. This is a good opportunity to talk to your students about waste and sustainability.

On **pages 9 and 10**, Lemur and Chameleon refill their drink bottles from a stream. It is unwise to drink directly from streams in real life, because they may carry harmful germs, parasites, or chemicals. It is best to use a filter, which can come in the form of a drink bottle or a separate system. In some cases, boiling the water may make it safe to drink. This is a good opportunity to talk about water access in your country, and where it is safe to drink water from.

### Mathematical language and concepts

A variety of words are used throughout the story to indicate measurement and comparison. Students should be able to recognise and understand these words. However, measurement is particularly language-heavy, so be patient with your students as they learn.

Concept	Words and phrases	Definition
Length		<p>We have not yet defined distance, so at this level we can describe length as “how far it is from here ... to here”.</p> <p>In this case:</p> <ul style="list-style-type: none"> <li>the height of each bottle is how far it is from its top to its bottom (<b>pages 4-5</b>)</li> <li>the width of each bottle is how far it is from one side to the other (<b>page 6</b>)</li> <li>the lengths of Chameleon’s tongue and Lemur’s tail is how far it is from the base to the tip (<b>page 13</b>).</li> </ul>

	too short, longer	<p>We compare lengths using derivatives of “short” and “long”.</p> <p>“<i>Too</i> short” is not a statement comparing the length of Chameleon’s tongue with the length of Lemur’s tail. Rather, it compares the length of the tongue with how far it is from Chameleon to the drink bottle. Chameleon’s tongue is not long enough to reach the bottle.</p>
	shorter, taller	We compare heights using derivatives of “short” and “tall”.
	narrower, wider	<p>We compare widths using derivatives of “narrow” and “wide”.</p> <p>We can also use derivatives of “thin” and “thick”, or “skinny” and “fat”. However, be mindful that the last two words are used sensitively, as they can be used to describe physical appearance, not necessarily in a kindly way.</p>
<b>Mass</b>		<p>We could say informally, but with <i>reasonable</i> scientific accuracy, that the mass of an object is the amount of “stuff” used to form it. However, this description is hard to distinguish from volume. Instead, we appeal to the students’ <i>experience</i>, by describing the <i>mass</i> of an object as how heavy or light it is. We can now clearly distinguish mass from volume, since we can give our students a small but heavy object to hold, or a large but light object to hold.</p> <p>It is common practice to say we “weigh” an object to find its mass. However, please do <i>not</i> talk about the “weight” of an object as a substitute for the word “mass”, as this is incorrect.</p> <p>Ask your students to think about <i>why</i> there is a difference in the mass of the bottles. We have tried to show that Lemur’s bottle is made from <i>plastic</i>, and so is lighter, and Chameleon’s bottle is made from <i>metal</i>, and so is heavier.</p>
	lighter, heavier	<p>We compare mass using derivatives of “light” and “heavy”.</p> <p>Be patient with spelling “heavier”. We need to change the “y” in “heavy” to an “i” before we add the comparative “-er” suffix. It is a tough word within a language-rich book.</p>
<b>Area</b>		Area refers to the size of a surface or region.
	covers more area	<p>This is a comparative phrase indicating a greater amount of area.</p> <p>We can also compare area using derivatives of “small” and “large”. Ask your students to do this on <b>page 8</b>.</p>

<b>Capacity</b>		<p>The capacity of an object is the measure of the amount of material it can contain. Capacity is usually used when referring to how much liquid or gas an object can hold. In this story, we have used water.</p> <p>We can use derivatives of “small” and “large” to describe capacity. In this book, we have shown the bottles have equal capacity by being quite specific about how much they can hold (2 cups of water).</p>
<b>Volume</b>		We move quickly from capacity ( <b>pages 9-10</b> ) to volume ( <b>page 11</b> ) in this book. While capacity refers to how much a container <i>can</i> hold, volume refers to the amount of liquid that is <i>actually</i> in the container.
	empty	When a container is empty, it has nothing inside it.
	full	When a container is full, we cannot put anything more inside it.

We have not covered *depth* in this book, which we can describe using derivatives of “shallow” and “deep”. You can ask your students whether they think the river on **pages 10 and 13** is shallow or deep. What makes them think that? For example, on **page 13** we can see small rocks protruding from the water, suggesting that at least this section of the river could be shallow. However, the animals are crossing the river on a bridge instead of walking through the water. This might suggest that the water is deep, or that it is not safe to walk through for some other reason, such as sharp rocks, or dangerous animals.

Depending on where you are in the world, your students may bring personal drink bottles to school. After reading the book, you can set the students the task of comparing their drink bottles in pairs. They will need to think about *how* to measure the bottles, particularly when it comes to area, mass, and capacity. They will also need to think about the effect of having water in the bottles when they weigh them. For a *fair* comparison, both bottles should be empty, if possible.

At the end of the exercise, students can write a statement to describe their drink bottle. For example: “My drink bottle is tall, narrow, light, and has a large capacity.”

### For students requiring extension

These students may be able to complete the above task in groups of three, requiring them to *order* three drink bottles. To do this, they will need to use vocabulary with the superlative “-est” suffix. For example:

- shortest, tallest
- narrowest, widest
- smallest, largest
- lightest, heaviest.

These students may also be ready to think more about measuring *volume*, which we only mention in passing in this book with “empty” and “full”. There, we refer to the volume of liquid *inside* the bottles. The volume of the bottle itself is the amount of *space it takes up*. We can measure this using water displacement. If possible, set up a tub or bucket of water for your students, with a towel ready

for drying. The tub or bucket should not be totally full, but there needs to be enough water for the drink bottles to be completely submerged. Take note of the water level in the tub (you could do this using an erasable whiteboard marker or masking tape). Have one student at a time place their bottle in the water, then record how far the water rises. The higher the water rises, the greater the volume of the bottle. Make sure the water starts at the same water level each time. It is best if the drink bottles are full of water when you do this, so that they are heavy enough to sink and the students do not need to hold them under the water (having their arms in the water will change how much is displaced!).

If seated, individual work is more suitable for these students in your context, ask them to go back through the book for themselves and think of as many other words as they can to describe the measurements on each page. For example:

- we do not have many options other than “shorter” and “taller” on **page 5**
- “thinner”, “thicker”, or “skinnier”, “fatter” on **page 6** (again, be mindful that the last two words are used sensitively, as they can be used to describe physical appearance, not necessarily in a kindly way)
- we do not have many options other than “lighter” and “heavier” on **page 7**
- “smaller area”, “larger area” on **page 7**
- “same capacity”, “equal capacity” on **page 10**
- we do not have many options other than “shorter” and “longer” on **page 13**.