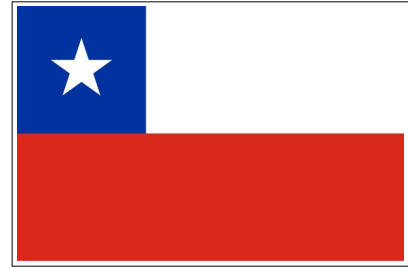**Setting**

Builder Bee is set in the country of Chile, which is in the region of South America. Encourage students to locate Chile on a world map, if you have one.

The flag of Chile is seen on the forklift on **page 15**.

On **page 2**, the queen bee is wearing a crown made from Chile's national flower known as the "copihue" or "Chilean bellflower" (scientific name: *Lapageria rosea*). This flower is only found in Chile, and is the only known species of the genus *Lapageria*, making it a very unique flower indeed!

Characters

The bee species (*Caupolicana fulvicollis*) on which we have modelled our characters is native to Chile. It does not look like a stereotypical black and yellow bee that students may have seen in fictional images and videos. Ask students to identify similarities and differences between the bees in the story and bees they have seen before (in real life or in fiction). Consider fur (colour, shade of yellow, length), body (length, shape), stripes (number, width), antennae (length, shape), wings (size, shape), etc.

Story

Bees do not *choose* the shape of honeycomb. They place the wax in blobs and hexagons form naturally as the most efficient structure. The story mentions some of the factors which contribute to the hexagon being the best shape: less wax needed, more space inside, strong structure.

Builder Bee is set on a construction site. Ask your students to identify the machines and tools they see.
- **Cover:** dump truck, tool box, building plans, small crane, large crane, cement mixer
- **Page 3:** crane
- **Page 4:** tool box, spirit level, paint brush, brick trowel, paint roller
- **Page 5:** crane, bulldozer/front loader
- **Page 6:** crane, brick trowel, paint brushes, spirit level, tool box
- **Page 7:** brick trowel
- **Page 8:** bulldozer/front loader, brick trowel
- **Page 9:** tool box, cement mixer, brick trowel, measuring tape
- **Page 10:** spirit level, brick trowels, measuring tape, dump truck
- **Page 11:** brick trowel, tool box, spool of electrical cable
- **Page 12:** building plans/blueprints, spirit level, brick trowel, measuring tape
- **Page 14:** tool box
- **Page 15:** forklift, shovel (in a pile of wax), crane, brick trowel, tool box, ladder

✳ **HAESE MATHEMATICS**

The pots of wax throughout the story serve a similar purpose to tins of paint. The vehicles may have different names in different regions – use whichever is most common in your country.

Safety is essential on construction sites. This involves identifying *hazards,* assessing the *risks* they pose, and then *managing* the risks using safety measures.
An example:
- Hazard: objects (tools, building materials, etc.) falling from scaffolds, cranes, or bees flying overhead.
- Risk: workers below could be hit by the objects and be injured or killed.
- Safety measure: workers must wear hard hats, warning signs and fences can be used to alert workers on the ground to workers overhead.

Show your students a page, ask them to identify hazards, potential risks, and safety measures.

The safety measures we have shown include:
- hard hats (to protect workers' heads from falling objects)
- warning signs (to remind workers of safety measures and to alert them to hazards)
- safety cones (to alert workers to hazards)
- fencing (to create a physical barrier between workers and hazards)
- scaffolding (to provide a stable surface for workers to stand on when working at a height).

Ask your students to notice these details on each page and why they might be used. Also encourage students to identify any instances where a safety measure *should* be in place, but is not. For example, **on pages 12-13**, Bee is not wearing a hard hat, which should be kept on at *all* times when on a construction site.

Students will notice that there are different coloured hard hats, with different letters on them. "R" stands for "rookie" (a beginner, or learner), and "E" stands for "expert".

Mathematical concepts and language
Technically, our honeycomb is not made of 2-dimensional shapes but 3-dimensional prisms. This is necessary to show the structure of honeycomb, but we are not ready to introduce students to prisms just yet. Our focus is on the shapes at the ends of the honeycomb.

A variety of basic shapes are shown throughout the story. Students should be able to identify the shapes on sight, recognise that a circle is made using a curve, and recognise the number of edges and corners of the other shapes:

circle	1 curve	
triangle	3 edges	3 corners
square	4 edges	4 corners
octagon	8 edges	8 corners
hexagon	6 edges	6 corners

✳ HAESE MATHEMATICS

There is a lot of language for students to learn in Shape. It is unrealistic to expect all students to learn all the words this year, but it is important to make a start and learn what we can.

It is correct to refer to the "edges" of a shape, but we more commonly call them "sides". Everyone does this, so it is not something we need to avoid. However, this creates a dilemma when we move to 3-dimensional solids, because we call the edges of a solid "edges", and we call the faces of the solid "sides". Hence the word "side" has been shifted from a line to a surface. This is common language. We just need to be patient and deal with it.

It is important, however, to use "side", "edge", and "line" only for *straight* lines, and to simply call curves "curves". This will help avoid confusion about the definition of a line, which does not change direction. For example, we say "a circle is made using a curve". We must *not* say "a circle has 1 curved side".

The more correct mathematical word for a corner is *vertex*. However:
- When we introduce *vertex*, we will also need its plural *vertices*. This is simply too hard for young children.
- "Corner" is a useful word for everyday language. We talk about street corners, and we talk about the corners of a book, rather than its vertices.

For students requiring extension
Some students may be ready to think about the honeycomb as being made up of 3-dimensional solids. You can encourage such students to count the faces, edges, and corners of these solids. They do not necessarily need to name all the prisms at this stage. Technically, the prisms are *hollow* so they have no ends. Some students may count only the faces they see on the page, others may mentally "fill in" these missing faces. You may like to show the students images of solid prisms for comparison.

Prism	Hollow	Solid		
cylinder	1 curved surface	2 faces and 1 curved surface	2 curves	
triangular prism	3 faces	5 faces	9 edges	6 corners
rectangular prism	4 faces	6 faces	12 edges	8 corners
octagonal prism	8 faces	10 faces	24 edges	16 corners
hexagonal prism	6 faces	8 faces	18 edges	12 corners

It is important to use "face" only for *flat* surfaces, and "edges" and "corners" only where *flat* surfaces meet. So, in the case of a cylinder, we must be careful to talk about "curved surfaces" and "curves" but *not* "curved faces" and "curved edges".

✹ HAESE MATHEMATICS