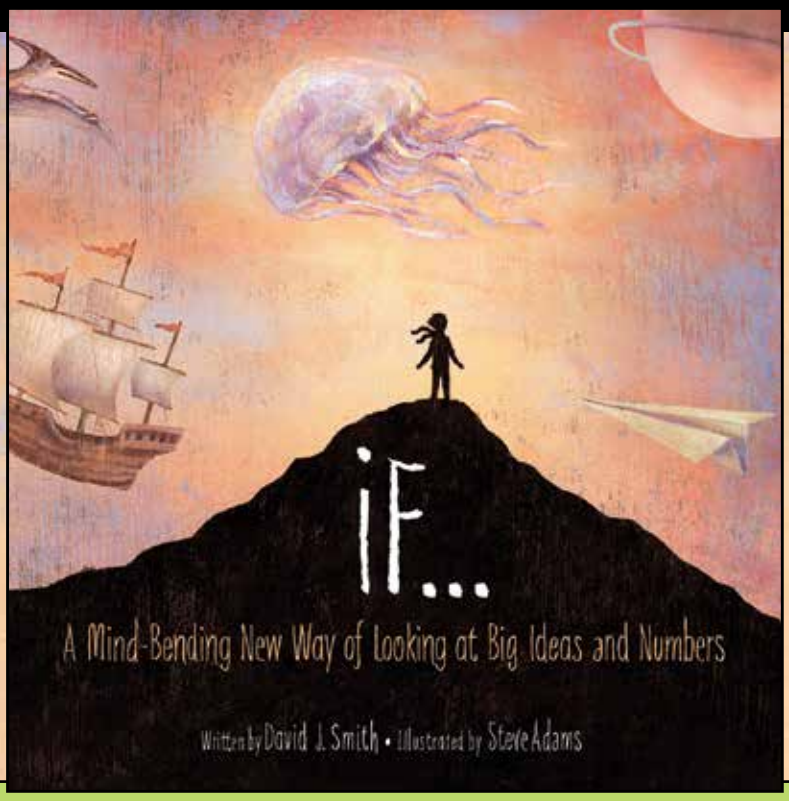
iF... related classroom activities for K–6 teachers



If: A Mind-Bending New Way of Looking at Big Ideas and Numbers

Written by David J. Smith
Illustrated by Steve Adams
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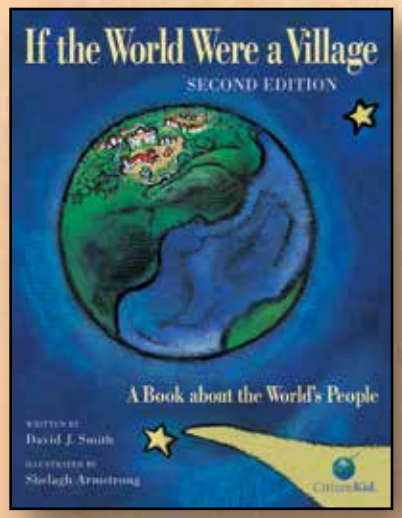
About the Author

David J. Smith is an author, teacher and educational consultant with over 25 years of experience in the classroom. He achieved national recognition for his unique method of teaching Year 7 students to draw maps of the entire world from memory, now published as a highly successful curriculum, Mapping the World by Heart, and won the U.S. Department of Education's A+ for Breaking the Mold Award for his work.



First published to wide acclaim in 2002, his eye-opening and bestselling book *If the World Were a Village* has since become a classic, promoting "world-mindedness" by imagining the world's population — all 7.1 billion of us — as a village of just 100 people. It has received numerous awards including the Notable Social Studies Trade Books for Young People, the International Reading Association's Children's Book Award and the Parents' Choice Award, among many others. *If the World Were a Village* has been updated with current statistics, several new activities and completely new material on food security, energy and health. By exploring the lives of the 100 villagers, children will discover that life in other nations is often very different from their own. **With his new book *If*, David J. Smith now focusses our attention to looking at big ideas and numbers in a mind-bending new way.**

Note from the Author

Dear Teacher,

My interest in scale began when I was a boy, building model ships. As a teacher, I used a lot of activities related to models and scale to get children thinking about the sizes and relationships of big things. These exercises taught me just how powerful scales and modelling can be. From ideas like this came my books *If the World Were a Village, If America Were a Village* and *This Child, Every Child.* They scale down big ideas and issues into something more digestible, more meaningful.

Here are some activities to use with children to help them understand scale by playing with it and using their imaginations. Try them and, most importantly, have fun, think imaginatively, ask students to create scales and time lines, and rely on rounding. And don't worry — you can't do it wrong.

David J. Smith

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Classroom Activities

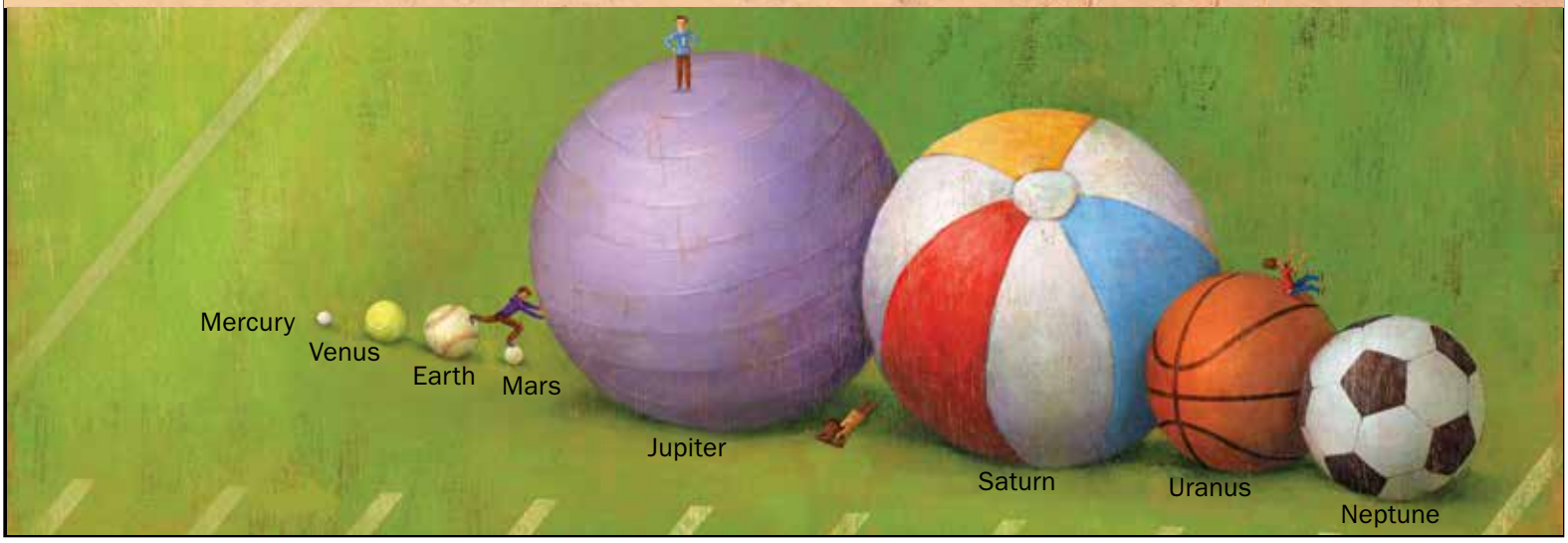
Start a Scale Collection

Children are surrounded by objects that have been scaled down, such as dolls, toy cars and dinosaurs. Gather some toys and help children figure out their scale. For example, a real *Tyrannosaurus rex* was about 12 m (40 ft) long. Measure a scaled-down *T. rex* toy and figure out its scale. Let's say the toy dinosaur is 10 cm (4 in) long. A life-size *T. rex* at 12 m is 1200 cm, so the scale of this model *T. rex* would be 10:1200, which would be expressed as 1:120. In inches, the scale would be 4:480, or 1:120.

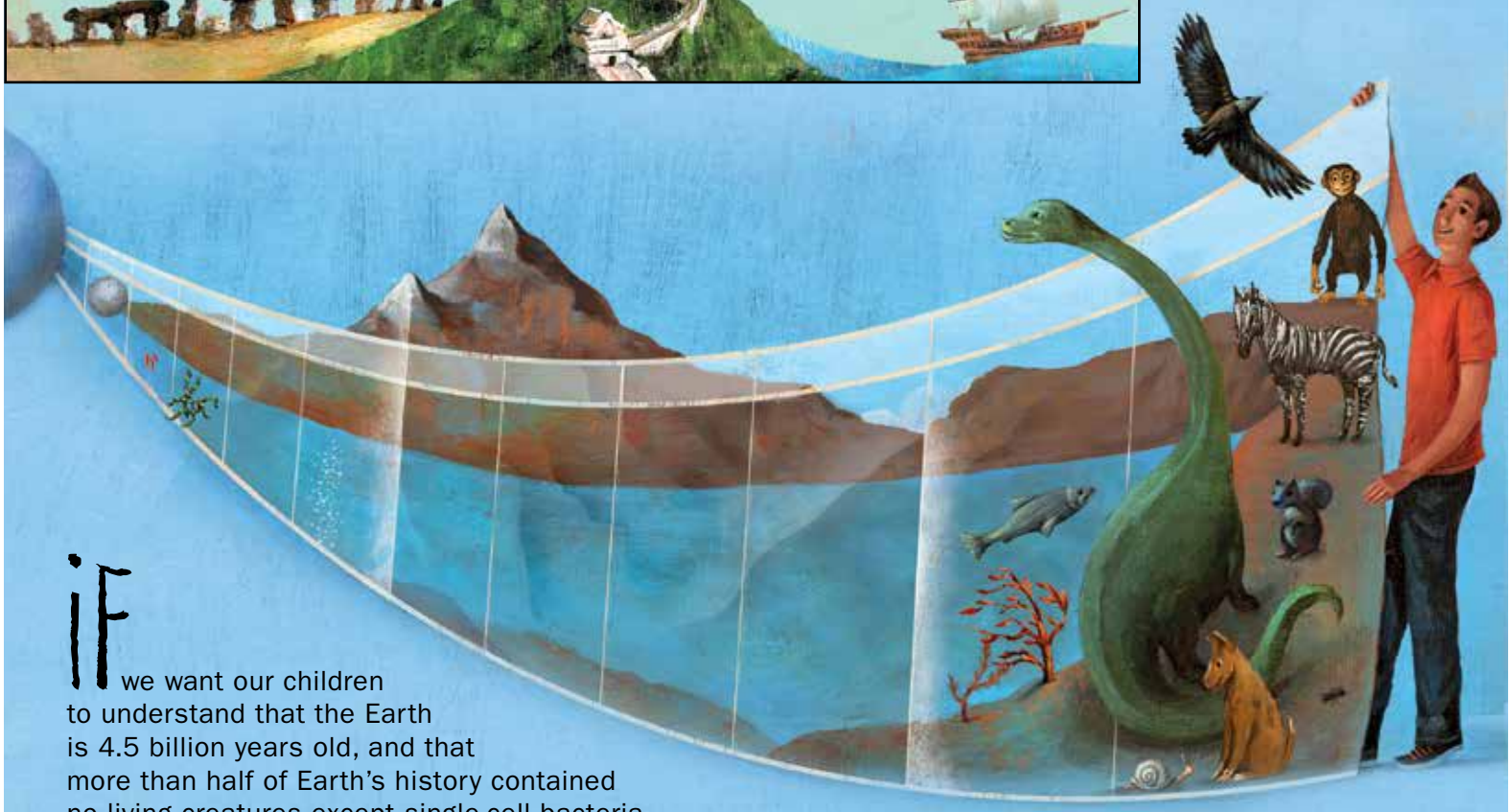
Play with the Solar System

Make a scale model of the Solar System in your classroom, on the football field or from one end of the school to the other. Decide what you want to use to represent the Sun, and this website — http://www.exploratorium.edu/ronh/solar_system/index.html — will calculate the sizes of the planets and their distances from the Sun. For example, if your Sun is to be a golf ball, with a diameter of 42.6 mm (1.68 in), then Neptune would be 1.3 mm (1/20 in) in diameter, and it would be 138 m (452.7 ft) away from the Sun. A small grapefruit with a diameter of 203 mm (8 in) puts Mercury at 0.7 mm (1/36 in) in diameter and 8.5 m (27.9 ft) away, while Neptune would be 6.6 mm (1/4 in) and over 656 m (2155 ft or 2/5 mi) away.

You can stretch your model Solar System across the classroom on a string, or pick locations around the school the correct distance from the "Sun." This works best when students work in groups of four or five, and each group comes up with their own solution.



Play with Earth's History



If we want our children to understand that the Earth is 4.5 billion years old, and that more than half of Earth's history contained no living creatures except single-cell bacteria, then it helps to be sure that they understand just how big a billion is. If the planets in the Solar System were laid out on a 100-metre football field, then the last million years is only about 20-25 cm near the goal line. More than half the field represents the era that contained no life except single-celled organisms.

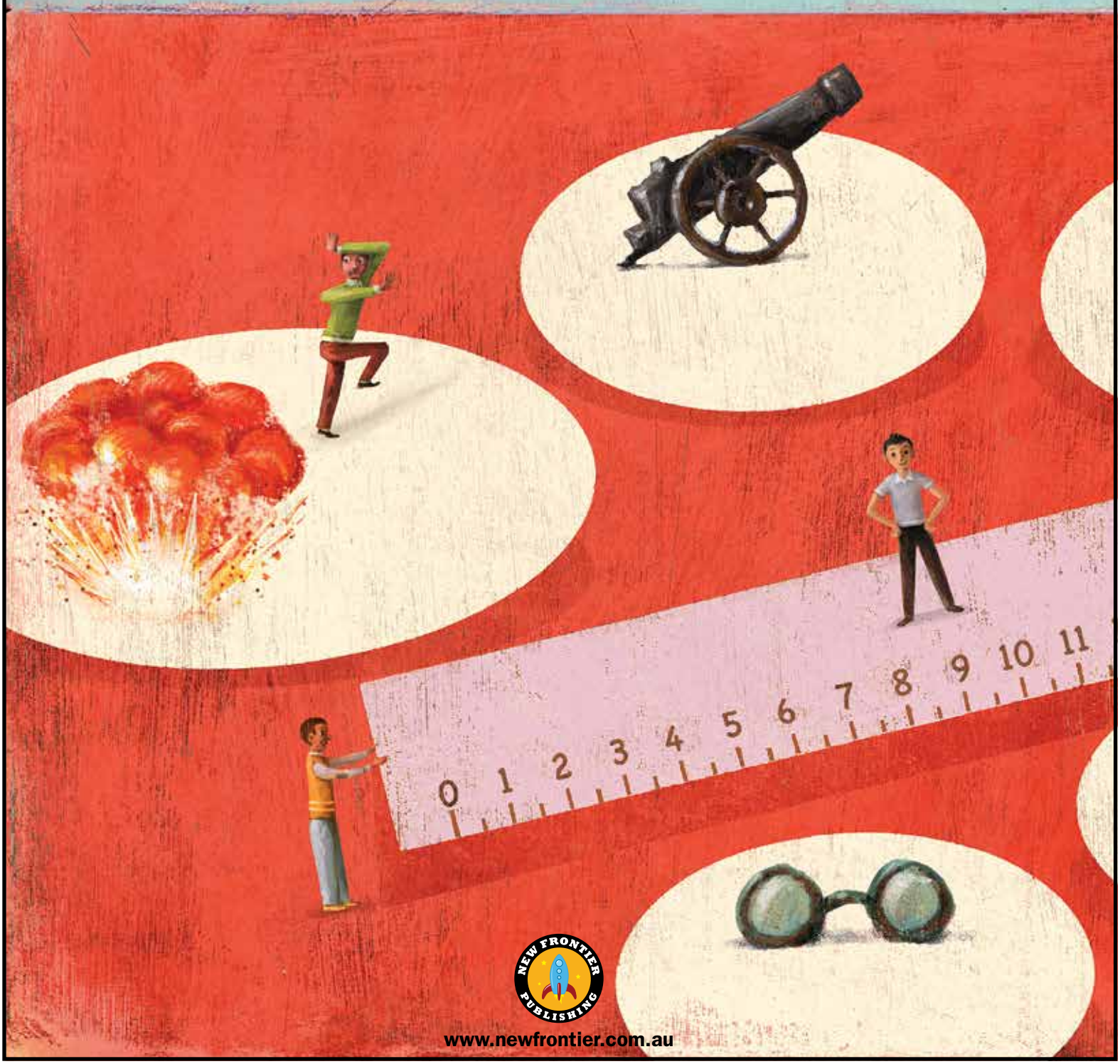
Use the time scales in the book to figure out where you would stand along the sidelines to represent the first living organisms, the dinosaurs, etc.

Do the same thing by turning a 12-month calendar into an Earth-history time line. Each day represents 12 328 767 years; each hour represents 513 698 years; each minute equals 8561 years; each second in the 12-month year represents 142 years. So where in the calendar year would you place the arrival of first organisms, fish, primates, fungi, dinosaurs and humans?

Think About Scaling Up Rather Than Down

For another activity, try scaling up small things. Many towns celebrate something important to them with a large-scale version. For example, Coffs Harbour, NSW, has the famous Big Banana, while Kingston, South Australia, has a huge lobster. What would be a good symbol for your family or school? Decide on something and help children work out the scale they would like it to be. Then help them calculate the dimensions of the scaled-up symbol.

Or scale up a small picture or map. Divide the picture you want to scale up into sections by making a grid. Make a larger grid on a blank piece of paper at the enlarged size. Then copy each of the sections of the small picture onto the equivalent sections of the larger grid.



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