**ACTIVITY: What makes up soil?**

**Activity idea**

In this activity, students a paper-based graphic organiser to explore their ideas about the components of soil.

By the end of this activity, students should be able to:

* recognise that inorganic mineral particles are components of soil
* recognise that organic matter (including living things) is a component of soil
* recognise that water and air are components of soil
* justify their choices.

[Introduction/background notes](#Introduction)

[What you need](#need)

[What to do](#Do)

[Answers](#answers)

[Images for classifying](#images)

Graphic organiser worksheet: [What makes up soil?](#what)

**Introduction/background**

All soil is made up of inorganic mineral particles, organic matter (including living things), air and water. The mineral particles come from the rocks (parent materials) that formed the soil. Different amounts and difference combinations of these components give soils their special properties.

Some of the images are not straight forward or are open-ended to encourage student thinking and debate. For example, components from soil are used to make concrete, but concrete does not make up soil. Volcanic material, such as pumice, is part of some New Zealand soils but not the whole volcano.

**What you need**

* Tray of soil (actual soil is preferred over potting mix)
* Access to the interactive [What makes up soil? – graphic organiser](https://www.sciencelearn.org.nz/drag_and_drops/9-what-makes-up-soil-graphic-organiser) and the paper-based [images for classifying](#images) and graphic organiser worksheet [What makes up soil?](#what)
* Access to the science ideas and concepts article [What is in soil?](https://www.sciencelearn.org.nz/resources/890-what-is-in-soil)
* Access to the science ideas and concepts article [Soils are all different](https://www.sciencelearn.org.nz/resources/891-soils-are-all-different)

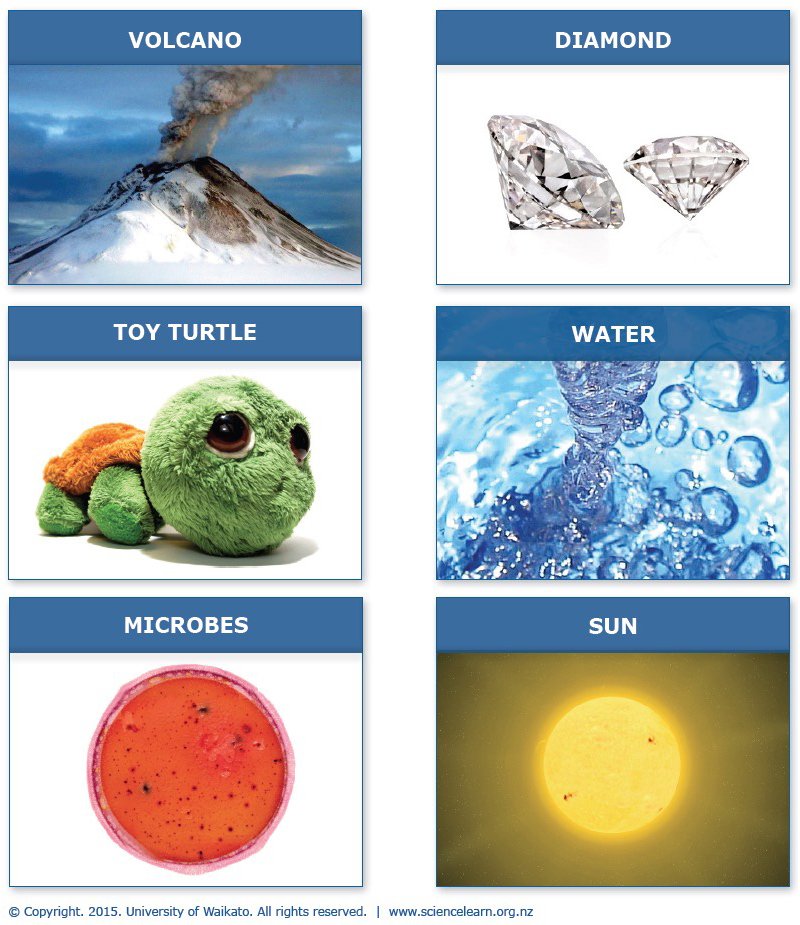
**What to do**

1. Ask individual students to handle and observe the soil. Ask them what they think makes up the soil. Discuss the results with the class and make a class list of soil components.
2. In small groups, use the [online](https://www.sciencelearn.org.nz/drag_and_drops/9-what-makes-up-soil-graphic-organiser) or paper-based version of the graphic organiser to explore ideas. If using the paper-based version – cut-up [images for classifying](#images) and the graphic organiser worksheet [What makes up soil?](#what)
3. As a whole class, complete the organiser on an interactive white board or similar. Students are allowed to move an image card if they do not agree with its position, but the student must justify why it is being moved.
4. If students disagree or are unsure of any of the images, refer to the articles [What is in soil?](https://www.sciencelearn.org.nz/resources/890-what-is-in-soil) and [Soils are all different](https://www.sciencelearn.org.nz/resources/891-soils-are-all-different) to aid discussion.
5. Refer back to the class list of soil components. Discuss differences.
6. If desired, print or save the completed graphic organisers for assessment/portfolios.

**Answers**

|  |  |
| --- | --- |
| **Item** | **Makes up soil – yes or no** |
| Sand | yes |
| Pebbles | yes |
| Air | yes |
| Clay | yes |
| Earthworms | yes |
| Dead insects | yes |
| Dead leaves | yes |
| Concrete | no |
| Volcano | no |
| Diamond | no |
| Toy turtle | no |
| Water | yes |
| Microbes | yes |
| Sun | no |

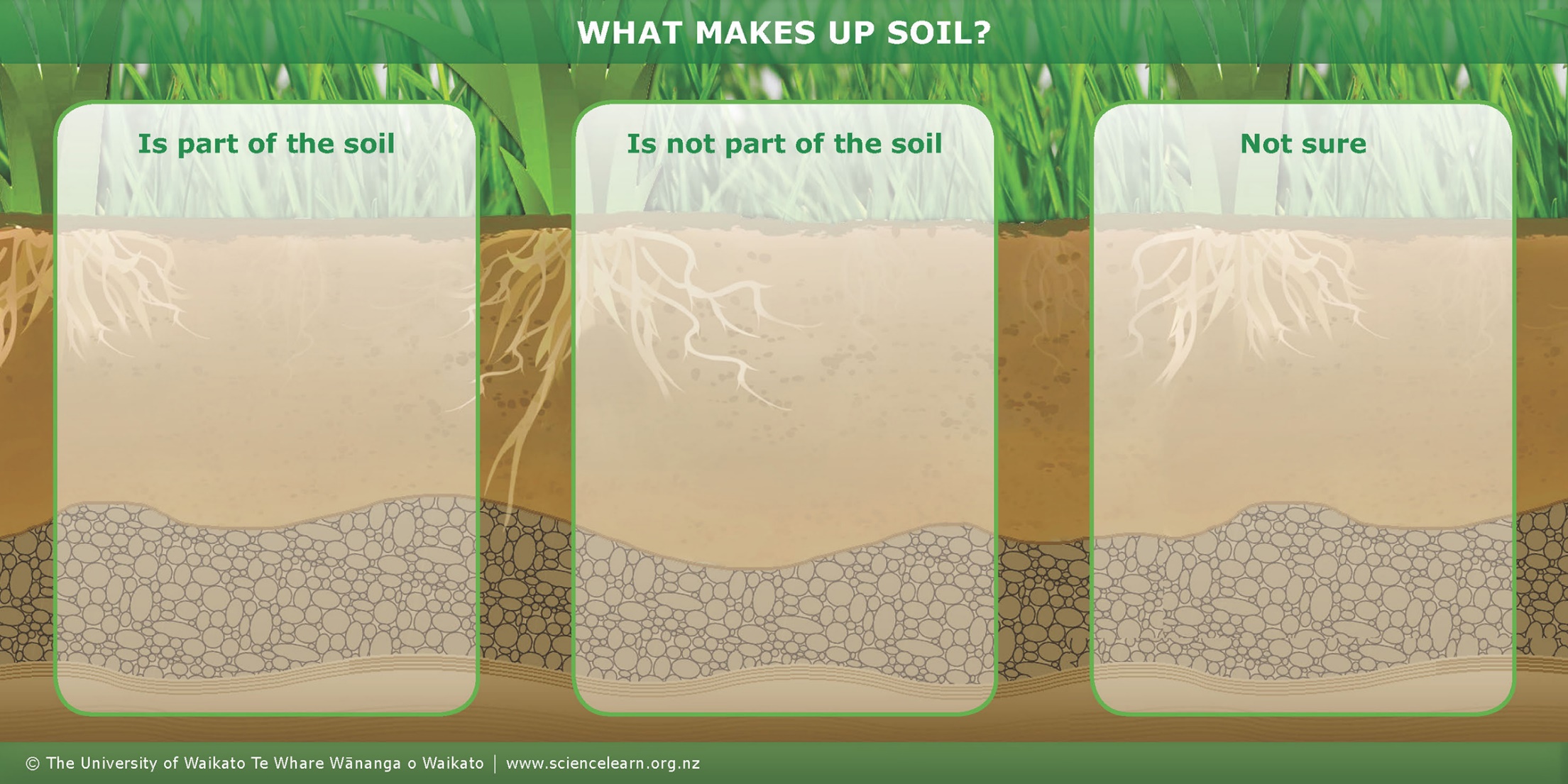
**Images for classifying**

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**Image card acknowledgements**

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Turtle plushie by Anil Öztas. Licensed under [CC-BY-SA-3.0-de](https://creativecommons.org/licenses/by-sa/3.0/de/deed.en)   
Microbes, earthworms and dead insects, © University of Waikato

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