

## Part 6

You are going to read a magazine article about communication between trees. Six sentences have been removed from the article. Choose from the sentences **A–G** the one which fits each gap (37–42). There is one extra sentence which you do not need to use.

Mark your answers on the separate answer sheet.

## How trees communicate

Can trees communicate with each other? Surprisingly, the answer seems to be that they can. Forest ecologist Dr Suzanne Simard, from the University of British Columbia in Canada, has been studying tiny living organisms, or fungi, which form underground communication networks between trees in North American forests. Big old trees, nicknamed 'mother trees', are central to this network, playing a key role in supporting smaller trees in the forest – in particular, their own offspring.

Simard explains that if you're a mother, you put your children first and tend to give them special treatment. **37**  In situations where they would normally compete with other trees, they adjust their behaviour to make room for their own family members. They communicate their presence through their fungal networks, so when a very young tree tries to establish itself on the forest floor, it can just link into the mother tree's root systems and so join the fungal network, taking advantage of its considerable resources.

What is more, these networks don't just operate between related trees. They may also form between different species in the same community. For example, Simard also traced the amounts of carbon, nitrogen and water moving between a Douglas fir and a paper birch tree, both native to the forests of British Columbia. In one experiment a tree was artificially prevented from getting the light it needed to grow healthily. **38**  The nutrients it needed flowed into the tree from others, through the networks between them.

In another study, Simard showed that within a 30 by 30 metre wooded area, an estimated 250 to 300 different trees were connected by fungal networks. This is of huge benefit to the trees and these networks allow a wider variety of tree types to survive in one area. **39**  This diversity creates a basis for a forest that's resilient to disease, climate change and pests such as insects.

Other research has suggested that trees use fungal networks to warn their neighbours about impending attacks from pests. According to Simard, when trees are attacked, they increase their own protection against the invaders by producing a substance which helps them to defend themselves. **40**  When these messages are detected, the other trees upgrade their protection systems by producing chemicals of their own.

**41**  Western Australia, for example, is dominated by healthy trees that don't rely on them, possibly due to the fact that the soil there is richer in nutrients. However, Australian Eucalyptus forests do have networks, although no research has yet been done into what their function might be.

Simard believes her findings have implications for forestry practices which involve the cutting down of old trees. 'We need to leave these trees standing so that they are able to send their messages into the soil to surrounding plants.' Forests are frequently damaged by fire, she says. **42**  And it may be that protecting old trees will not only contribute to the restoration of these wooded areas, but may also prevent non-native species from invading them.

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|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <b>A</b> Each species has its own strengths and weaknesses.                                        | <b>E</b> Whether fungal networks are used may depend on the local ecosystem.    |
| <b>B</b> These can travel between trees in as little as six hours.                                 | <b>F</b> Conserving their networks could help them recover after such an event. |
| <b>C</b> As they do this, chemical signals pass through their networks to nearby trees.            | <b>G</b> Research suggests that trees do the same thing.                        |
| <b>D</b> In response, the surrounding trees began to share resources rather than compete for them. |                                                                                 |