Watch the following video and complete the missing words. Don't use capital letters!

This is a tomato plant, and this is an aphid slowly …….. the tomato plant by sucking the juice out of its leaves.

The tomato is putting up a fight using both physical and chemical defenses to …….. the attacking insects. But that's not all.
The tomato is also releasing compounds that signal nearby tomato …….. to release their own insect repellent.

Plants are constantly under …….. They face threats ranging from microscopic fungi and bacteria, small herbivores, like aphids, caterpillars, and grasshoppers, up to large herbivores, like tortoises, koalas, and elephants. All are looking to devour plants to access the plentiful nutrients and …….. in their leaves, stems, fruits, and seeds.

But plants are ready with a whole series of internal and external …….. that make them a much less appealing meal, or even a deadly one. Plants' defenses start at their …….. The bark covering tree trunks is full of lignin, a rigid web of compounds that's tough to chew and highly impermeable to pathogens. Leaves are protected by a waxy cuticle that deters insects and microbes.

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Some plants go a step further with …….. structures to warn would-be predators. Thorns, spines, and prickles discourage bigger herbivores. To deal with smaller pests, some plants' leaves have …….. hair-like structures called trichomes. The kidney bean plant sports tiny hooks to stab the feet of bed bugs and other insects. In some species, trichomes also dispense chemical irritants. Stinging nettles release a mixture of histamine and other toxins that cause pain and inflammation when touched.

For other plant species, the pain comes after an herbivore's first bite. Spinach, kiwi fruit, pineapple, fuchsia and rhubarb all produce microscopic needle-shaped crystals called raphides. They can cause tiny wounds in the inside of animals' ……, which create entry points for toxins.

The mimosa plant has a ……. designed to prevent herbivores from taking a bite at all. Specialized mechanoreceptor cells detect ……. and shoot an electrical signal through the leaflet to its base causing cells there to release charged particles. The buildup of charge draws water out of these cells and they shrivel, pulling the leaflet closed. The folding movement scares …….. away and the shrunken leaves look less appealing to larger animals.

If these external defenses are breached, the plant immune system springs into action. Plants don't have a separate immune system like animals. Instead, every cell has the …….. to detect and defend against invaders. Specialized receptors can recognize molecules that signal the presence of …….. microbes or insects.

In response, the immune system initiates a …….. of defensive maneuvers. To prevent more pathogens from making their way inside, the waxy cuticle thickens and cell walls get stronger. Guard cells seal up pores in the leaves.

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And if microbes are devouring one section of the plant, those cells can self-destruct to quarantine the infection. Compounds toxic to microbes and insects are …….. produced, often tailor-made for a specific threat. Many of the plant molecules that humans have adopted as drugs, medicines and seasonings evolved as part of plants' immune systems because they're antimicrobial, or insecticidal.

An area of a plant under attack can alert other regions using hormones, airborne compounds, or even electrical signals. When other parts of the plant detect these signals, they ramp up …….. of defensive compounds. And for some species, like tomatoes, this early warning system also alerts their neighbors.

Some plants can even recruit allies to adopt a …….. offense against their would-be attackers. Cotton plants under siege by caterpillars release a specific cocktail of ten to twelve chemicals into the air. This …….. attracts parasitic wasps that lay eggs inside the caterpillars.

Plants may not be able to flee the scene of an attack, or fight off predators with teeth and claws, but with sturdy armor, a well-stocked chemical arsenal, a neighborhood watch, and cross-species alliances, a plant isn't always an …….. meal.

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