Whale Poo Could Help Save the World!

Use the word bank to help you fill in the missing words so the information makes sense.

millions	balance	atmosphere	phyto	vast	absorb
reproduce	phytoplankton	extinction	breed	microscopic	excrete
migrate	photosynthesize	logical	majestic	release	depths

There's no denying that whales are beautiful, _____ and mesmerising creatures. Recent science has also shown that the vital part they play in the ocean ecosystem (particularly when they poo) could actually help save the world!

Over the past few hundred years, whales have been hunted and killed by humans for their meat, oil and bone. Whalers were among the first Europeans to arrive in Aotearoa New Zealand in the 1820s and 1830s. But by 1956 whales were practically gone from the Southern Ocean and in 1964, the whaling trade in New Zealand died out. Some scientists estimate that there has been a 60–90% reduction in overall whale numbers because of the whaling trade, with tens of _____ of whales being killed.

It's possible we wouldn't have whales in the oceans at all right now, if it weren't for the International Whaling Commission (founded in 1949) and an organisation started in the 1970s called Save the Whales. As a result of their efforts, many countries signed up for a ban on commercial whaling in 1982.

Sperm whales in particular have been described as ecosystem engineers because they help support the balance and health of the oceans. Most other large whales are baleen whales and therefore don't eat octopus and squid. When sperm whales want to feed, they dive down to the _____ of the ocean. As they descend, their bodies shut down all non–essential functions to conserve oxygen – that includes pooing.

Down in the deep they feast on their favourite foods, octopus and squid. Whales can weigh anything up to 35 000kg, so they need to eat a lot of food, about 200 tons per year. Octopus and squid are full of the nutrient iron, which they store in their dark ink.

When they've eaten enough food, the whales travel back to the surface and that's when they _____ these enormous faecal plumes which is a scientific way of saying that they do a big poo. Whale poo is very loose and runny, with a few chunky bits in it sometimes. Because of its consistency, it floats around at the top of the water instead of sinking. This floating faeces is packed full of iron. The whales don't need all the iron they've consumed for themselves, so they poo out about 90% of it.

Whale poo brings essential nutrients (including iron) from the depths of the ocean to the surface, which in turn stimulates the growth of phytoplankton. What are phytoplankton? Derived from the Greek words _____ (plant) and plankton (made to wander or drift), phytoplankton are _____ organisms that live in watery environments. They are the base of all marine food chains and they love iron! Phytoplankton don't care where the iron comes from, even if it's in the form of whale poo!

When there's lots of iron available, it creates the perfect growing conditions for phytoplankton and they begin to _____ at a much greater rate. Scientists have observed that phytoplankton can double their numbers in a single day and create huge turquoise swirls in the water, called blooms. These drift near the surface of the ocean and are often visible from space.

Iron is an essential nutrient required for photosynthesis. When there are large blooms of phytoplankton they begin to _____, converting tons of sugar out of CO2 and water. In the process they _____ lots of dissolved CO2 which has ended up in the ocean from the air.

If the phytoplankton don't get eaten by other sea animals, they eventually die and sink to the bottom of the ocean, taking the carbon part of CO2 with them. These carbon deposits can remain there for thousands of years. The deep oceans become a _____ carbon sink that traps and stores this excess carbon from the atmosphere. Phytoplankton capture an estimated 40% of all the CO2 produced, four times the amount captured by the Amazon rainforest!

But wait, there's more. Whales are vitally important for nutrient recycling in the ocean, both vertically (from the depths to the surface) and horizontally (migration). Whales undertake some of the longest migrations of all mammals. They travel

through the year to different parts of the ocean to feed, breed, give birth to and nurse their young calves.

Grey whales, for instance, migrate 16 000km between feeding and calving areas and back every year. New Zealand is about 1600km long, so grey whales travel ten times this distance and back! As whales _____ they carry and _____ ocean fertiliser in the form of their iron-rich runny poo from places in the ocean that have good nutrient supply, to places that need it. They're like giant ocean crop dusters!

When whales die, it's called 'whale fall'. As their carcasses sink, not only do they provide meals for up to four hundred other species, but they carry huge amounts of carbon which descends to the seabed with them. This carbon is also trapped and held in the carbon sink. It's estimated that whale carcasses transport around 190 000 tons of carbon to the deep ocean when they die, which is the same amount of carbon produced by 80 000 vehicles each year.

When whaling was at its peak, so many whale carcasses were removed from the ocean that it likely changed the weight and distribution of whale falls. As a result this probably led to the _____ of a number of species that were reliant on whale carcasses for survival.

So let's think this through. Global warming and climate change are huge issues in the world today, right? What if we not only kept whales in the oceans but protected them and their habitats so they can continue to feed and _____ which will increase their numbers? It's not like the ocean is going to run out of room any time soon! (Remember whales keep the ocean ecosystem balanced and stable and therefore support healthy fisheries.)

More whales in the ocean would equal more whale poo. More whale poo would equal more _____ blooms, which would equal more photosynthesis. An increase in photosynthesis would mean more carbon could be captured and removed from our _____. More whales would also imply more whale fall and more carbon stored in the carbon sink at the bottom of the ocean.

Follow this new science and knowledge to its _____ conclusion...

WHALE POO COULD HELP SAVE THE WORLD!

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Answers

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