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「你/妳低頭望向海面， *波紋之下，一道巨大的身影緩緩游動。* *牠沒有聲音，卻讓整片海安靜下來。* *你/妳，正一步步靠近牠。」*	As you lower your gaze toward the sea, a giant shadow slowly glides beneath the rippling surface. It makes no sound, yet the entire ocean seems to fall silent. Step by step, you are drawing closer to it.
「你/妳跟著牠游進海裡。 *光、魚群，還有會呼吸的藍。」*	You follow it into the sea —surrounded by light, schools of fish, and a living, breathing blue.
海洋的溫柔巨人—緩慢成長的海洋旅人 **The Gentle Giant of the Ocean — A Slow-Growing Traveler** 世界上最大的魚類，體長可達約 20 公尺，約等於 1.6 輛大型遊覽車 身上布滿如星空般的白色斑點，是每一尾鯨鯊獨一無二的「身分證」 棲息於三大洋熱帶與亞熱帶海域，性情溫和，以浮游生物及小型魚類為食，對人類沒有攻擊性 鯨鯊成長速度緩慢，科學研究推估性成熟年齡需要 30 年以上，繁殖週期長，族群恢復速度受到限制。 鯨鯊屬於晚熟型大型魚類，保育需仰賴長期監測與棲地守護。	**The Gentle Giant of the Ocean — A Slow-Growing Traveler** The whale sharks are the largest fish on earth, their body length can be up to 20 meters- roughly equivalent to the length of 1.6 large tour buses. Their body are covered with white spots like a starry night sky. This unique pattern serve as an individual "ID card" for every whale shark. Whale sharks inhabit tropical and subtropical waters across three major oceans. Gentle by nature, they feed on plankton and small fish and are not aggressive toward humans. Whale sharks grow slowly. Scientific studies estimate that they may take more than 30 years to reach sexual maturity. Their long reproductive cycle limits the speed of populations recovery. As large, late-maturing fish, whale sharks depend on long-term monitoring and habitat protection for their survival.
鯨鯊的身體密碼 **The Secrets of the Whale Shark**	**The Secrets of the Whale Shark**

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每一處構造，都是鯨鯊適應海洋生活的重要秘密。透過局部特寫模型，近距離觀察牠的白色斑點、皮膚紋理與嘴部構造，邀請你/妳一起探索這位海洋溫柔巨人的獨特特徵。	Every part of a whale shark's body reveals how it is adapted to life in the ocean. Through close-up models, take a closer look at its white spots, skin texture, and mouth structure, and invite you to discover the unique features of this gentle giant of the sea.
科學家怎麼研究?	**How Do Scientists Study Whale Sharks?**
鯨鯊個體辨識(Photo ID) 每尾鯨鯊的白色斑點都像指紋一樣獨一無二，研究人員可透過拍攝背上的斑點排列，就能辨識個體並追蹤牠們的活動。 用照片，建立牠的身分檔案透過拍攝頭部與體側斑點區域，可建立個體影像資料庫，並進行比對辨識。 「鯨鯊水中拍攝」的基本原則： 保持安全距離(至少 3 公尺) 清楚拍攝清楚拍攝包含體側鰓裂後方斑點區域 記錄時間與地點資訊	**Whale Shark Photo Identification (Photo ID)** Every whale shark has a unique white spot pattern, much like a human fingerprint. By photographing and comparing these spot patterns, researchers can identify individual whale sharks and track their movements. Creating an Individual Profile Through Photography Photographs of the head and spotted areas along the lateral body can be used to build an image database for comparison and identification. **Basic Guidelines for Underwater Whale Shark Photography:** Keep a safe distance of at least 3 meters. Clearly photograph the spotted area behind the gill slits on the lateral body. Record the date, time, and location.
每一張來自海洋觀察者的影像，都可能成為重要的保育資料，希望大家成為保護鯨鯊的公民科學家。	Every image from ocean observer matters for conservation. Become a citizen scientist and help protect whale sharks.

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掃描 QR code，學習如何為鯨鯊拍照	Scan the QR code to learn how to photograph whale sharks.
鯨鯊吃什麼?——濾食高手的秘密 **What Do Whale Sharks Eat? — The Secrets of Filter Feeding** 身軀龐大的鯨鯊，卻以溫和的方式覓食。牠透過「前推式」與「吸入式」攝食，將海水與食物一同吸入口中，再利用鰓耙過濾海水，留下浮游生物、小魚等食物，是海洋中令人驚嘆的濾食高手。 **鯨鯊鰓耙** 鰓耙的作用類似過濾器，可攔截浮游生物、磷蝦、小型甲殼類、小魚等食物，幫助鯨鯊輕鬆進食。	**What Do Whale Sharks Eat? - The Secrets of Filter Feeding** Despite their enormous size, whale sharks feed in a gentle way. They use both ram feeding and suction feeding, drawing seawater and food into their mouths. Their gill rakers then filter out the water while retaining plankton, small fish, and other prey, making them remarkable filter feeders of the ocean. **Whale Shark Gill Rakers** Gill rakers function like filters. They trap plankton, krill, small crustaceans, small fish, allowing whale sharks to feed efficiently.
🔬科學家怎麼知道牠吃什麼? **How Do Scientists Track Whale Sharks?** 簡易流程示意：胃內容物(看吃什麼)➜DNA 分析(分析食物)➜穩定同位素分析(長期飲食來源)➜綜合判讀(瞭解食性及生態位階)	**How Do Scientists Know What Whale Sharks Eat?** **Simplified Process:** Stomach Content Analysis (identifying what the animal has eaten) → DNA Analysis (identifying food species) → Stable Isotope Analysis (determining long-term dietary sources)

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科學家不只關心鯨鯊「吃了什麼」，更想瞭解牠「長期如何覓食」 透過分析鯨鯊肌肉組織中的碳、氮同位素訊號，推估牠長期的營養來源、覓食環境，以及在海洋食物網中所扮演的角色。結合胃內容物與 DNA 分析等方法，能更全面瞭解鯨鯊的食性與生態位階。	→ Integrated Interpretation (understanding feeding habits and trophic position) **Scientists are interested not only in what whale sharks have eaten, but also in how they feed over the long term.** By analyzing carbon and nitrogen isotope signals in whale shark muscle tissue, researchers can estimate their long-term food sources, feeding environments, and role in the marine food web. Combined with stomach-content and DNA analyses, these methods provide a more complete understanding of whale shark diets and ecological niches.
🐟猜猜我是誰? 三種軟骨魚類擁有截然不同的嘴部與牙齒構造，你/妳能從牠們的齒顎外型，猜出牠們的生活方式嗎? **翻開看看答案吧！**	**Knock Knock, Guess Who?** Three cartilaginous fishes have very different mouth and tooth structures. Can you tell how they live by looking at their jaws and teeth? Flip the panels to reveal the answers!
翻牌內容 í 鯨鯊齒顎 - 溫柔的濾食高手 • 世界上最大的魚類 • 牙齒細小，幾乎不拿來咬食物 • 主要利用巨大的嘴巴吸入及過濾海水，捕食浮游生物、小魚、頭足類及小型甲殼類如磷蝦、橈足類、螃蟹幼蟲等	**Flip-panel text** **Whale Shark Jaws — The Gentle Filter-Feeding Expert** The largest fish species in the world. Its teeth are tiny and rarely used for feeding. It feeds mainly by opening its enormous mouth to draw in and filter seawater, capturing plankton, small fish, cephalopods, and small crustaceans such as krill, copepods, and crab larvae. **Ornate Eagle Ray Jaws — A Specialist in Bottom-Dwelling Shellfish and Crustaceans**

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í 龍紋鱗齒顎 - 底棲貝類與甲殼類專家 • 嘴巴位於身體腹面。 • 牙齒扁平且排列緊密，像磨盤一樣。 • 能輕鬆壓碎貝類、螃蟹等帶有硬殼的獵物。 í 灰鯖鮫齒顎 - 高速掠食者 • 擁有匕首狀尖齒牙齒，細長且向內彎曲，邊緣極度光滑如刃 • 游泳速度快，能迅速追捕魚類、魷魚等獵物 • 牙齒適合咬住並固定獵物	Its mouth is located on the underside of its body. Its flat, tightly packed teeth function like grinding plates. It can easily crush hard-shelled prey such as shellfish and crabs. **Shortfin Mako Shark Jaws — A High-Speed Predator** It has slender, dagger-like teeth that curve inward, with exceptionally smooth, blade-like edges. Its remarkable swimming speed allows it to swiftly pursue fish, squid, and other prey. Its teeth are adapted for gripping and securing prey.
誰在跟著鯨鯊一起旅行? **Who Travels with the Whale Shark?** 鯨鯊體型巨大、性情溫和，在海中緩慢移動，吸引各種魚類共遊。 有的魚「搭便車」節省力氣，有的幫忙清除寄生蟲，也有的躲在牠身邊尋求保護。 對這些生物來說，鯨鯊不只是路過的巨人，而是一座移動中的海洋棲地。 搭便車的乘客 - 鮣魚 吸附在鯨鯊身上移動，並吃掉殘餘食物。 清潔員 - 小型魚類 啄食皮膚上的寄生蟲，幫助鯨鯊維持健康，如裂唇魚。	**Who Travels with the Whale Shark?** Whale sharks are enormous yet gentle, moving slowly through the sea and attracting many kinds of fish to swim alongside them. Some fish hitch a ride to save energy, some help remove parasites, and others stay close for protection. To these animals, a whale shark is more than a passing giant - it is a moving marine habitat. Hitchhiking Passengers—Remoras Remoras attach themselves to whale sharks, travel with them, and feed on leftover food. The Cleaners—Small Fish Small fish, such as cleaner wrasses, pick parasites from the whale shark's skin and help keep it healthy. The Followers—Pilot Fish

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跟隨者 - 領航魚 利用鯨鯊的體型降低被掠食的風險，如無齒鰺。	Fish such as the golden trevally use the whale shark's large body to reduce the risk of being preyed upon.
海洋旅行家──鯨鯊的洄游之旅 **Travelers — Whale Shark Migration** 鯨鯊廣泛分布於熱帶與亞熱帶海域，從沿岸到外洋皆可見其蹤跡；研究顯示其可進行深達約 2,500 公尺的垂直潛水，展現高度的垂直移動能力。 鯨鯊會隨著食物及海洋環境變化進行長距離洄游，在部分海域可見數十至上百尾同時聚集	**Travelers - The Whale Shark's Migration Journey** Whale sharks are widely distributed in tropical and subtropical waters, from coastal areas to the open ocean. Studies show that they can make vertical dives to depths of about 2,500 meters, demonstrating remarkable vertical movement. Whale sharks migrate long distances in response to changes in food availability and ocean conditions. In some regions, dozens or even hundreds may gather at the same time.

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在臺灣周邊海域，幾乎全年都有機會發現鯨鯊的蹤跡，牠們也是與人類共享海洋的重要夥伴	Whale sharks can be found in waters around Taiwan almost year-round. They are important companions with whom we share the ocean.
科學家如何追蹤鯨鯊? **How Do Scientists Track Whale Shark?**	**How Do Scientists Track Whale Sharks?**
科學家利用不同的標識技術，追蹤鯨鯊的移動路徑、活動範圍及棲息環境，揭開牠們神祕的海洋旅程。	Scientists use different tagging technologies to follow whale sharks' movements, activity ranges, and habitats, revealing the mysteries of their ocean journeys.
研究方法包含： 傳統外部標籤：識別與回報個體資訊 衛星標籤：透過衛星接收大尺度資料並回傳移動路徑與活動深度 聲學標籤：蒐集區域尺度資料可瞭解棲地利用行為	**Research methods include:** Conventional external tags: used to identify individuals and report information. Satellite tags: transmit large-scale data by satellite, including movement routes and diving depths. Acoustic tags: collect regional-scale data to help researchers understand habitat use and behavior.
研究發現 鯨鯊不只在海面附近活動，也會在不同深度間垂直移動，尋找食物，展現豐富而多樣的海洋生活。 臺灣長期投入鯨鯊與其他軟骨魚類研究，累積的重要成果，也為海洋保育提供了重要的科學依據。	**Research Findings** Whale sharks do not remain only near the sea surface. They also move vertically through different depths in search of food, revealing a rich and varied ocean life. Taiwan has long invested in research on whale sharks and other cartilaginous fishes. The important findings accumulated over the years provide a strong scientific foundation for marine conservation.
	Key Discoveries in Whale Shark Reproductive Research

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鯨鯊繁殖研究的重要發現 **Key Discoveries in Whale Shark Reproductive Research** 1995 年，臺東成功漁港首次發現懷孕母鯨鯊，體內孕有超過 300 尾胎仔，成為全球鯨鯊繁殖研究的重要突破。 此發現證實鯨鯊由體內受精，胚胎會在卵內發育，期間母體會供應營養給發育中的幼體，侍發育完成後，會以胎生方式生產出來。 國立海洋生物博物館研究團隊曾成功照護早產胎仔，從出生時僅 58 公分、1 公斤，經過 143 天飼育，成長至 143 公分、12.02 公斤，成為全球首例鯨鯊胎仔人工照護與生殖生物學研究紀錄。 研究成果分別於 1996 年《第四屆國際水族館會議》及 1997 年國際學術期刊《Copeia》發表，奠定臺灣在全球鯨鯊研究與保育上的重要地位。	In 1995, a pregnant female whale shark carrying more than 300 embryos was discovered at Chenggong Fishing Harbor in Taitung, Taiwan, providing groundbreaking insights into whale shark reproduction. This discovery confirmed that whale sharks reproduce through internal fertilization. The embryos develop within egg capsules inside the mother, where they receive nourishment before being born as live young. A research team at the National Museum of Marine Biology and Aquarium (NMMBA) successfully cared for a prematurely born whale shark pup. Measuring only 58 centimeters and weighing 1 kilogram at birth, it grew to 143 centimeters and 12.02 kilograms after 143 days, becoming the world's first documented case of artificial care and reproductive biology research involving a whale shark pup. The findings were presented at the Fourth International Aquarium Congress in 1996 and published in the international scientific journal Copeia in 1997, establishing Taiwan's important role in global whale shark research and conservation.
從利用到守護的轉變 **From Exploitation to Conservation** 過去因鯨鯊具有經濟價值，在國際間曾被大量捕獲，臺灣也曾長期作為漁業資源利用，過去俗稱「豆腐鯊」。	**From Exploitation to Conservation** In the past, whale sharks were heavily harvested worldwide because of their economic value. In Taiwan, they were also exploited as a fishery resource for many years and were commonly known as “tofu sharks.” Scientific research has since revealed that whale sharks grow slowly, reproduce at a low rate, and have a limited capacity for

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隨著科學研究發現，鯨鯊成長緩慢、繁殖不易，族群恢復速度有限，全球逐漸重視其保育需求。 **國際保育進程** 2002 年 鯨鯊被列入《瀕臨絕種野生動植物種國際貿易公約(CITES)》附錄 II，開始納入國際貿易管制。 2016 年 世界自然保護聯盟(IUCN)將鯨鯊列為「瀕危(Endangered)」物種，顯示其族群已面臨高度風險。 2025 年(CITES CoP20) 因族群持續下降，鯨鯊升列至 CITES 附錄 I，成為最高等級保護物種，國際商業貿易原則上全面禁止。 **臺灣亦逐步推動保育措施：** 2001 年建立鯨鯊漁獲通報與資源管理制度(Chen & Phipps, 2002) 2005 年推動配額縮減與活體優先放流 2008 年全面禁止捕撈與買賣鯨鯊	population recovery. As a result, their conservation needs have received increasing global attention. **International Conservation Milestones** **2002** The whale shark was listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), bringing its international trade under regulation. **2016** The International Union for Conservation of Nature (IUCN) classified the whale shark as **Endangered**, indicating that its population faced a high risk of extinction. **2025 — CITES CoP20** In response to continued population decline, the whale shark was uplisted to CITES Appendix I, the highest level of protection under the Convention. International commercial trade is now generally prohibited. **Taiwan has also progressively introduced conservation measures:** **2001:** Established a whale shark catch-reporting and resource-management system (Chen & Phipps, 2002). **2005:** Began reducing catch quotas and prioritizing the release of live whale sharks. **2008:** Completely prohibited the capture, sale, and purchase of whale sharks. **2020:** Listed the whale shark as a protected marine wildlife species.

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2020 年列入海洋保育類野生動物名錄 2021 年建立混獲通報機制，強化救援與釋放 截至 2026 年 6 月，臺灣已成功通報並釋放誤捕鯨鯊 452 尾。 從過去的資源利用，到今日結合科學研究與漁業管理的守護行動，鯨鯊保育正逐步邁向與人類共存的新階段。 **翻翻牌 - 鯨鯊的秘密小檔案** 題目：鯨鯊會攻擊人類嗎? 答案：不會。牠是溫和的濾食性魚類，主要吃浮游生物、小魚、磷蝦與藻類唷。(大嘴濾食圖) 題目：每一尾鯨鯊都長一樣嗎? 答案：不一樣！牠們的斑點就像指紋，每一尾都獨一無二。(星點比對圖) 題目：鯨鯊只在海面活動嗎? 答案：不是！！牠們可以深潛超過數百公尺深，再回到表層覓食。 題目鯨鯊生產力高嗎? 答案：其實很低，個體成熟可能需要數十年以上。 題目：你/妳能為鯨鯊做什麼?	**2021:** Established a bycatch-reporting system to strengthen rescue and release efforts. As of June 2026, Taiwan had successfully documented and released **452 accidentally caught whale sharks**. From its former exploitation as a fishery resource to today's conservation efforts combining scientific research with fisheries management, whale shark conservation is entering a new era of coexistence between people and wildlife. Flip Cards — Whale Shark Secrets 1. Do whale sharks attack humans? **Answer:** No. Whale sharks are gentle filter feeders that mainly eat plankton, small fish, krill, and algae. *(Illustration of filter feeding with an open mouth)* 2. Do all whale sharks look alike? **Answer:** No! Their spot patterns are like fingerprints—each whale shark has a unique pattern. *(Spot-pattern comparison graphic)* 3. Do whale sharks stay only near the ocean surface? **Answer:** No! They can dive hundreds of meters below the surface before returning to shallower waters to feed. *(Deep-diving movement graphic)* 4. Do whale sharks have a high reproductive rate? **Answer:** No. Their reproductive rate is very low, and they may take several decades to reach maturity. *(Growth-curve graphic)* 5. What can you do to help whale sharks? **Reduce plastic use** → Help keep the ocean clean. **Choose responsibly** → Support sustainable fisheries. **Share your sightings** → Contribute to scientific research. **Keep your distance** → Respect whale sharks in the wild.

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答案： 減少塑膠→守護乾淨海洋 友善消費→鼓勵永續水產品消費 分享照片→幫助科學研究 保持距離→尊重野生鯨鯊 關注保育→一起守護海洋 維護棲地→不隨意餵食，守護自然食物來源	**Stay informed about conservation** → Help protect our oceans. **Protect their habitat** → Do not feed whale sharks; help preserve their natural food sources.
主要參考資料 **Key References** 本展內容依據國內外鯨鯊研究成果整理，涵蓋： 🦈鯨鯊繁殖與生命歷程研究	**Key References：** The content of this exhibition is based on whale shark research conducted in Taiwan and around the world, covering: 🦈 Whale shark reproduction and life-history research 🌊 Whale shark ecology and behavior 📡 Satellite tracking and deep-diving activity 🌏 Fisheries management and conservation in Taiwan

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🌊鯨鯊生態與行為研究 📡衛星追蹤與深海活動研究 🌏臺灣漁業管理與保育研究 完整研究資料與延伸閱讀 請掃描 QR Code	**For complete research materials and further reading, please scan the QR code.**