

CHECKSHEET

PALAU - FRAGILE ECOSYSTEMS

(For students to complete during second viewing)

NAME:

DATE:

Listen carefully to the video, and fill in the blank spaces.

1. Palau's marine ecosystem is _____ and _____ to human activity.
2. The _____ and _____ creatures have adapted to life here over millions of years.
3. Strategically located just to the north of _____.
4. The stone at sea level is eroded gradually by _____ known as _____.
5. The _____ reef that surround these islands, were formed over _____ of years by tiny marine creatures called _____.
6. With such a _____ diverse ecosystem, there's a huge variety of tropical _____ and _____ to see.
7. Mangroves are the _____. They are vital to the health of the _____.
8. Mangrove forests are a most important _____ ground and _____ source for the entire marine ecosystem.
9. Diving _____ are attracted to Palau by the opportunity to explore these fascinating _____ relics.
10. Palau is at crossroads of _____ between the US and the rapidly growing _____ of the Pacific region.
11. Foreign companies from _____ and _____ exploit these waters and often abandon their derelict _____ in the harbour.
12. Shellfish including chittons living on the _____ get smothered by the _____. As well, the oil mixes with _____ and sinks to the sea bed coating _____.
13. The _____ plant serving the residents of Koror, is _____ and often breaks down.
14. Lead acid batteries leak _____ that are _____ to many marine organisms.
15. The process of _____ to protect the _____ is only starting.
16. Palauns _____ shared their food, and a system of _____ ensured there was enough for everyone.
17. Action is also needed to save the _____ - an important source of _____ for local people.
18. Conservation programs are _____, but without them how will the reef _____ the local people and a thriving _____.
19. Properly _____, tourism can bring Palau _____ prosperity.
20. Get it wrong, and the _____ of the _____ will surely follow.

WORKSHEET 1

REEF ECOLOGY

NAME:
DATE:

Drawing a conventional food web for animals and plants in a coral reef ecosystem is a very difficult task but the following exercise will indicate some of the complexities that exist within such an ecosystem. A study of the food habits of reef fish from the Marshall Islands provides the percentage figures which will help to develop an understanding of the complexity of coral reef ecosystems.

benthic (sea bottom) carnivores 56%

- goatfish eats small crustaceans (8)
- triggerfish eats benthic crustacean (8)
- trevally eat damsel fish (3)
- puffer fish eats sea urchin (2)
- porcupine ifsh east crab (3)
- slingjaw wrasse eats prawn (8)
- wrasse eats cone shell (3)
- red bass eats goatfish (4)
- snapper eats butterfly fish (3)
- hussar eats banana fish (4)
- moses perch eats damselfish (4)
- tururum eats moses perch (3)
- coral trout eats hussar (3)

mid water carnivores 12%

- grouper eats milkfish (2)
- hammerhead shark eats tururum (2)
- mackerel eats rock cod (2)
- cleaner wrasse eats parasitic crustaceans on the sweetlip (2)
- trevally eat yellow striped fusiliers (2)
- grouper eats snapper (2)

omnivores 7%

- surgeonfish eats fleshy algae on coral and newly settled invertibrates (2)
- goatfish eats small edible items disturbed by their barbels (2)
- coral cod eats disabled fish and invertibrates (2)
- spiders shell eats algae and scavenges the ocean floor (1)

planktivores 4%

- tiny damsel fish pick minute animals in the plankton
- ten mm long goby eat plankton
- whale shark eats plankton

coral feeders 4%

- butterfly fish eats coral polyps (3)
- crown of thorns starfish eats coral polyps (1)

detritus feeders 4%

- emperor fish feeds on benthic detritus
- wrass feeds on benthic detritus

scavengers 0% but include on species

- shark eats wounded snapper

herbivores 15%

- dugong feeds on the sea grass (2)
- green turtle feeds on the sea grass (1)
- sea urchin feeds on the sea grass (5)
- parrotfish eats fleshy algae on coral (5)
- surgeon fish delicately browse algae on the coral (5)

Activity:

Draw a diagram of fish feeding on a coral reef, to show the relationships between animals and plants on coral reefs in Palau. Construct a number of arrows to illustrate the percentage of each type of fish in the reef ecosystem. For example, there would need to be 8 such arrows showing triggerfish eating benthic crustaceans, only 1 arrow showing emperor fish feeding on benthic detritus and a dotted arrow to show the fate of the wounded arrow.

Each of these animals does not occupy a recognised niche as many land animals do. Rather, it coexists in a state of chaos where the actual types of fish and their numbers then determine the survival of larvae, the level of algae grazing and the unique assemblage of plants and animals in a particular part of the reef. Typically, reef fish tend to stay in teh same location, breed frequently and disperse their offspring as widely as possible.

Note: the percentage shown indicate what percentage of all species the group comprises.

WORKSHEET 2

NAME:

DATE:

MANGROVES

Indicate whether the following are true or false:

- A. 1. If mangroves are cleared sediments entering the lagoon will encourage coral polyps to grow
 2. Rotting mangrove leaves provide food for small animals
 3. Juvenile fish eat crabs, worms and mulluscs in mangroves
 4. In mangroves, crocodiles are near the bottom of the food chain
 5. Mangroves breathe carbon dioxide through their breating roots
 6. Mastigias are salt water jellyfish without stinging tentacles
 7. Mastigias have developed a similiar symbiotic relationship with algae as have coral polyps
 8. Mastigias dive down into the lake at night to avoid nocturnal predators
 9. Mastigias dive down into the lake at night to allow algae to replenish their nutrient supplies
 10. Mastigias are delicate and easily damaged by careless divers

True False
True False

REEFS AT RISK

B. Read the following passage and complete the blank spaces, selecting appropriate numbers and words from the list below:

15 years; rejected; World; planes; nuclear; 50; Palau; 11 000; archipelage; battles; Micronesia; Japanese; USA; savanna; installations; Compact; Trust.

Just over _____ years ago, the Republic of Palau was the scene of savage _____ between the attacking US Marines and the resolute _____ troops. Numerous guns, tanks and fighter _____ used in this conflict as well as over 34 Japanese sunken or stranded ships can be found throughout _____. More than _____ mostly Japanese troops died and the effects of these bloody conflicts on the biophysical environment were savage. Rainforest and _____ had been torched by US bombardment; gardens were unattended and abandoned and the reefs had been severely overfished to provide food for the 50 000 Japanese military personnel stationed in the _____.

After the Second _____ War the USA became the colonial ruler when Palau became a United Nations _____ Territory of the United States. It was envisaged that Palau would become a semi-indepenent state of _____. However this proposal was continually _____ by the Palauans. In essence the US wanted access to military _____ in Palau; whereas the Palauans were attracted to US dollars that would assist in economic development they were implacably opposed to the US keeping _____ weapons on their islands.

Finally, in the post cold war climate Palauans agreed to a _____ of Free Association with the US.