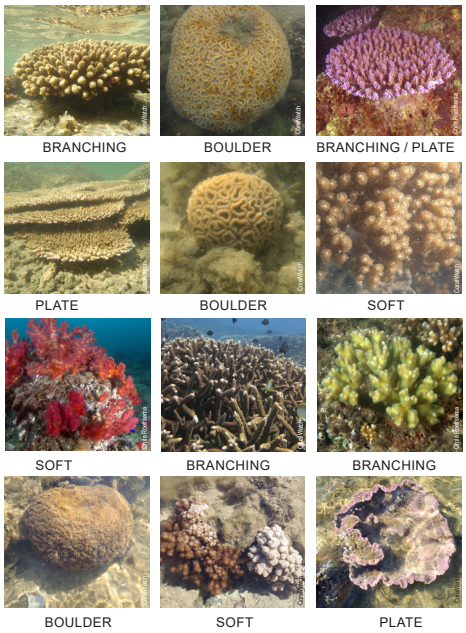
ACARA CURRICULUM LINKS AND ANSWER KEY FOR WORKSHEETS

WORKSHEET 1 - Identifying coral types

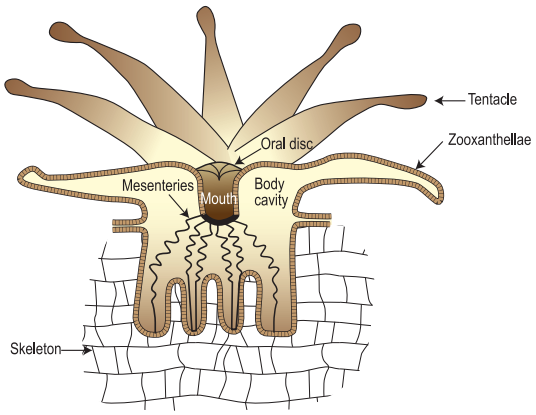
ACARA curriculum links
Science understanding (ACSU111)



WORKSHEET 2 - Moreton Bay corals

ACARA curriculum links
Science understanding (ACSU112)
Science inquiry skills (ACSIS124, CSIS132, ACSIS133)
Science as human endeavour (ACSHE223)

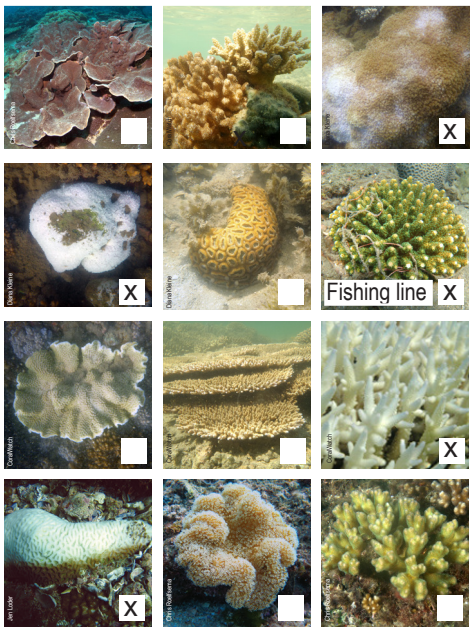
1.



2. Healthy reefs produce food for millions of people and help to protect coastal land from cyclones and storm surges. Reefs support local economies, providing employment from tourism and fishing industries.
3. In healthy coral, symbiotic algae (zooxanthellae) live within the coral tissue. Algae provide the coral with food and energy and give the corals their characteristic brown colour. In return the coral provides a home for the algae. Both parties benefit from living together.
4. Stressful environmental conditions can cause the coral to expel the algae, changing the coral colour to white. This whitening of coral is called 'coral bleaching'.
5. Coral health can be measured with the CoralWatch Coral Health Chart. CoralWatch uses colour as an indicator of coral health. However, coral colour is just one indicator of coral health. Other indicators could be % coral cover, species diversity & richness, the amount of macroalgae and fish present.

WORKSHEET 3 - Coral bleaching - sign of stress

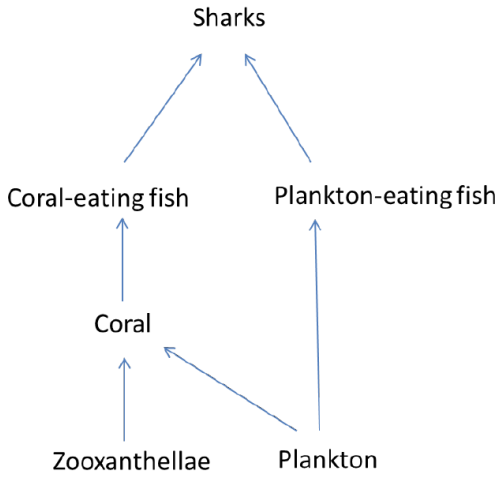
ACARA curriculum links
Science inquiry skills (ACSIS124)



WORKSHEET 4 - Corals: Consumer or Producer?

ACARA curriculum links
Science understanding (ACSU112)
Science as human endeavour (ACSHE223)

1. The primary producer in the coral-algae relationship are the algae named zooxanthellae.



ACARA CURRICULUM LINKS AND ANSWER KEY FOR WORKSHEETS

WORKSHEET 5 - Measuring coral health using virtual reef poster

ACARA curriculum links
Science understanding (ACSU112)
Science inquiry skills (ACSIS124, ACSIS125, ACSIS126, ACSIS129, ACSIS130, ACSIS131, ACSIS132, ACSIS133)
Science as human endeavour (ACSHE119, ACSHE223)

The Virtual Reef provides an opportunity to learn about coral bleaching and collect scientific data without visiting the reef - it can be used to prepare for a reef field trip or as a valuable alternative.
Discuss in class the results - results may vary slightly due to the use of photos with some shading.

WORKSHEET 6 - Interpreting real data from Moreton Bay

ACARA curriculum links
Science understanding (ACSU112)
Science inquiry skills (ACSIS124, ACSIS125, ACSIS126, ACSIS129, ACSIS130, ACSIS131, ACSIS132, ACSIS133)
Science as human endeavour (ACSHE119, ACSHE223)

Answers will vary, depending on the reef choice

WORKSHEET 7 - The water cycle of Moreton Bay

ACARA links
Science understanding (ACSSU116)

1. **Liquid** - a runny substance composed of molecules that move freely among themselves but do not tend to separate like those of gases; neither gaseous nor solid.
   Precipitation - falling products of condensation in the atmosphere, as rain, snow, or hail.
   Condense - to reduce to another and denser form, as a gas or vapor to a liquid or solid state.
   Evaporating - to change from a liquid or solid state into vapor.
   River - a natural stream of water of fairly large size flowing in a definite course or channel or series of diverging and converging channels.
   Catchment area - a drainage basin composed of the area drained by a river and all its tributaries / creeks.
   Water Cycle - the natural sequence through which water passes into the atmosphere as water vapor, precipitates to earth in liquid or solid form, and ultimately returns to the atmosphere through evaporation.
   Please note that Dictionary.com was used to obtain these definitions.
2.

Water cycle stages	Sea water	Water vapour	Water droplets	Rain	Flood water	River water	Sea water
Location	Ocean	Atmos-phere	Atmos-phere	Atmos-phere	Catchment area	River	Ocean

WORKSHEET 8 - Water cycle crossword

ACARA curriculum links
Science understanding (ACSSU116)

WORKSHEET 9 - Sediment runoff – human impact

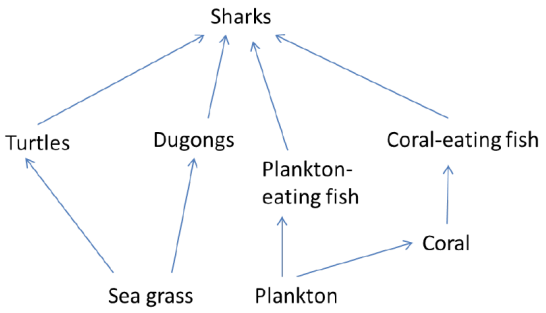
ACARA curriculum links
Science understanding (ACSSU116)
Science inquiry skills (ACSIS126, ACSIS130, ACSIS131, ACSIS133)

a. The course sediment size should settle to the bottom first.
b. The fine sediment size should settle to the bottom last.
c. Course sediment will settle at the mouth of the rivers but fine sediment will stay suspended blocking sunlight and eventually settle further out to sea smothering the inhabitants on reefs.
d. Aquatic plants, seagrass, algae and coral need sunlight to photosynthesise and produce the food and energy they need to survive, grow and reproduce.
e. Aquatic plants, seagrass, algae and coral will die if they are consistently smothered with sediment or have the sunlight blocked from reaching their photosynthetic cells.

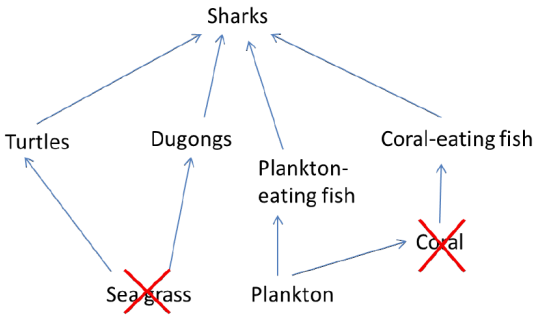
WORKSHEET 10 - Sediment runoff - Itered food webs

ACARA curriculum links
Science understanding (ACSU112)
Science inquiry skills (ACSIS124, ACSIS129, ACSIS130, CSIS132, ACSIS133)
Science as human endeavour (ACSHE223)

1.



ACARA CURRICULUM LINKS AND ANSWER KEY FOR WORKSHEETS

2. 

3. The number of turtles, dugongs and fish would reduce because they don't have enough food to eat if the algae and coral die from the sediment. The sharks would have less food to eat due to the reduced numbers of turtles, dugongs and fish. The sharks would eat more clams than before to make up its diet. Therefore the number of plankton-eating fish would also reduce.
4. The sediment influx caused by the heavy rain and exposed soil from farming and construction has reduced the biodiversity from 8 different types of organisms to 3 types of organisms.

5. The amount of sediment entering the waterways can be reduced by various means including the following:
   a) Planting vegetation along river banks to stabilise the banks and stop the soil washing down stream in heavy rainfall. See channel erosion: http://hlw.org.au/report-card/focusareas/channel-erosion and water management: https://portbris.com.au/environment/water-management
   b) Building a rain garden, see: http://hlw.org.au/getinvolved/help/raingarden
   c) Construction sites stop exposed sediment from washing into drains by implementing 'Erosion & sediment control' (ESC) practices. These practices include covering exposed soil and putting sediment barriers in drains at the construction site. See: http://hlw.org.au/initiatives/esc/principles

   Preventing sediment from entering waterways by any or all of the above methods will improve the water clarity and quality. The clearer water will allow more sunlight to penetrate to the bottom and increase the numbers of aquatic plants and corals. With an increase of aquatic plants and corals available for animals to eat, more snails, crabs, fish, turtles and dugongs will be able to survive and thus increasing the biodiversity of the associated marine environment.
6. Moreton Bay would have had clearer waters with more corals and bigger seagrass meadows. This environment would have supported a greater variety of animals and plants including turtles, dugongs and fish.
7. Prior to European settlement, coral bleaching may have occurred from high sediment runoff resulting from extreme floods. Extreme floods would have occurred as a result of tropical cyclones. Unlike now, the thick vegetation around the waterways would have filtered the sediment saving Moreton Bay from severe sediment loads. Also, there was less exposed soil available for washing into waterways because aboriginal farming and construction practices did not produce wide scale destruction of natural vegetation.

WORKSHEET FIELD 1 - Food webs - intertidal rocky shores

ACARA curriculum links

Science understanding (ACSSU116)
Science inquiry skills (ACSIS124, ACSIS125, ACSIS129)

Answers will vary depending on the flora and fauna findings by students in the intertidal rocky shores.

Examples of producers (photosynthetic) are:
Algae and seaweeds, seagrass, mangroves, kelp, zooxanthellae, phytoplankton.

Examples of consumers are:
Filter feeders (e.g. sponges, sea squirts, tunicates, clams, mussels, bivalves), limpets, crabs, gastropods, corals, shrimps, stingrays.

Primary consumers are herbivores. When we remove those from our foodweb, our next level up, secondary consumers (carnivores) may get into trouble. For example, removing zooplankton from the system will affect many filter feeders as they filter zooplankton from the water as their main/only food source.

WORKSHEET FIELD 2 - Identifying coral type

ACARA curriculum links

Science understanding (ACSSU116)
Science inquiry skills (ACSIS125, ACSIS126, ACSIS129, ACSIS130, ACSIS133)

Answers will vary depending on the coral type and species the students find.

Drawings of coral types should reflect the graphics on the back of the Coral Health Chart; boulder, branching, plate and soft.