Building Knowledge and Vocabulary
The Juicy Language of Text

Leadership I - Grades K–5 - Day 4
PACIFIC COD

*Gadus macrocephalus*

Sometimes known as Alaska Cod, Gray Cod

**SUMMARY**

Pacific Cod is a relatively fast growing fish that can produce several hundred thousand eggs per year. It is commercially fished in two regions, the Gulf of Alaska and the Bering Sea/Aleutian Islands, and both populations have good abundance. The main fishing methods for Pacific Cod are bottom trawl, pot, longline, and jig gear. Management in Alaska uses a series of catch limits, observer counts, closures, and permits to limit the overall ecosystem effects of the Pacific Cod fishery. Concerns regarding seabird bycatch and food availability for Steller’s sea lions have been addressed by recent management that has changed gear requirements to reduce seabird catch, and implemented a series of closures to protect critical sea lion habitat. In January 2010, the Marine Stewardship Council certified all gear types in the Gulf of Alaska and the Bering Sea and Aleutian Islands as sustainable fisheries.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Points</th>
<th>Final Score</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life History</td>
<td>1.75</td>
<td>2.40 - 4.00</td>
<td>📱</td>
</tr>
<tr>
<td>Abundance</td>
<td>2.25</td>
<td>1.60 - 2.39</td>
<td>🐟</td>
</tr>
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<td>Habitat Quality and Fishing Gear Impacts</td>
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<td>0.00 - 1.59</td>
<td>🐟</td>
</tr>
<tr>
<td>Management</td>
<td>3.75</td>
<td></td>
<td>🐟</td>
</tr>
<tr>
<td>Bycatch</td>
<td>1.50</td>
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**Final Score** 2.30

**Color** 🐟
LIFE HISTORY

Core Points (only one selection allowed)

If a value for intrinsic rate of increase (‘r’) is known, assign the score below based on this value. If no r-value is available, assign the score below for the correct age at 50% maturity for females if specified, or for the correct value of growth rate (‘k’). If no estimates of r, age at 50% maturity, or k are available, assign the score below based on maximum age.

1.00  Intrinsic rate of increase <0.05; OR age at 50% maturity >10 years; OR growth rate <0.15; OR maximum age >30 years.

2.00  Intrinsic rate of increase = 0.05-0.15; OR age at 50% maturity = 5-10 years; OR a growth rate = 0.16–0.30; OR maximum age = 11-30 years.

Pacific Cod females reach 50% maturity in the Gulf of Alaska at 4.4 years, and in the eastern Bering Sea at 4.9 years (Stark 2007), however, the average age of recruitment to the fishery is seven years (Kruse et al. 2000). Sizes at 50% maturity are 50.3 cm for Gulf of Alaska Cod, and 58 cm for eastern Bering Sea Cod (Stark 2007; AFSC 2009). Growth rates vary depending on age, but on average k=0.22 in the Bering Sea and k=0.18 in the Gulf of Alaska (SAFE Reports, 2009) The maximum recorded age of Pacific Cod is 25 years (Munk, 2001), however in the Bering Sea/Aleutian Islands and Gulf of Alaska groundfish fisheries, the maximum age observed is 19 years.

3.00  Intrinsic rate of increase >0.16; OR age at 50% maturity = 1-5 years; OR growth rate >0.30; OR maximum age <11 years.

Points of Adjustment (multiple selections allowed)

-0.25  Species has special behaviors that make it especially vulnerable to fishing pressure (e.g., spawning aggregations; site fidelity; segregation by sex; migratory bottlenecks; unusual attraction to gear; etc.).

Pacific Cod form dense spawning aggregations between 40-290 m deep that make large catches possible (NMFS 2004; Shimada and Kimura 1994). Major aggregations occur between Unalaska and Unimak Islands, southwest of the Pribilof Islands, and near the Shumagin group in the western GOA (NMFS, 2004).

-0.25  Species has a strategy for sexual development that makes it especially vulnerable to fishing pressure (e.g., age at 50% maturity >20 years; sequential hermaphrodites; extremely low fecundity).

-0.25  Species has a small or restricted range (e.g., endemism; numerous evolutionarily significant units; restricted to one coastline; e.g., American lobster; striped bass; endemic reef fishes).
-0.25 Species exhibits high natural population variability driven by broad-scale environmental change (e.g., El Nino; decadal oscillations).

Changing environmental conditions in the Pacific Ocean can impact Cod populations in many different ways by altering ocean productivity, food chains and the availability of food; changing the distribution and migratory patterns of adult fish, the timing and location of spawning, and larval transport patterns; and disrupting the development of eggs and larvae (NMFS 2004).

+0.25 Species does not have special behaviors that increase ease or population consequences of capture OR has special behaviors that make it less vulnerable to fishing pressure (e.g., species is widely dispersed during spawning).

+0.25 Species has a strategy for sexual development that makes it especially resilient to fishing pressure (e.g., age at 50% maturity <1 year; extremely high fecundity).

Pacific Cod is a highly fecund species that utilize external fertilization. Pacific Cod reach 50% maturity at about 4.5 years of age (Stark, 2007). Some studies have shown that sexually mature females can produce anywhere from 225,000 and 5 million eggs per year (Klovach et al., 1995).

+0.25 Species is distributed over a very wide range (e.g., throughout an entire hemisphere or ocean basin; e.g., swordfish; tuna; Patagonian toothfish).

The Pacific Cod occurs in the north Pacific, from the Bering Sea south to Santa Monica, California in the east, and to the Sea of Japan in the west (NMFS, 2004; PSMFC 1998). This is considered a medium size range so no points were added.

+0.25 Species does not exhibit high natural population variability driven by broad-scale environmental change (e.g., El Nino; decadal oscillations).

1.75 Points for Life History
ABUNDANCE

Core Points (only one selection allowed)

Compared to natural or un-fished level, the species population is:

1.00 Low: Abundance or biomass is <75% of BMSY or similar proxy (e.g., spawning potential ratio).

2.00 Medium: Abundance or biomass is 75-125% of BMSY or similar proxy; OR population is approaching or recovering from an overfished condition; OR adequate information on abundance or biomass is not available.

Populations in both the Bering Sea/Aleutian Islands and Gulf of Alaska remain above the threshold biomass levels defined by the North Pacific Council and are generally considered to be at healthy levels of abundance (NMFS, 2004). Although for 2010, female spawning biomass in the Bering Sea is approximately 345,000 t, which is slightly below the BMSY (B35%) of 360,000 t (Thompson, personal communication). The projected overfishing limit for 2010 is 205,000 t, and total allowable catch (TAC) for 2010 will be 168,780 t (msc.org). In the Gulf of Alaska, Cod age 3+ biomass for 2010 is estimated to be 701,000 t, with the 2010 spawning stock biomass estimated to be 118,000 t and BMSY (B35%) for the region estimated to be 102,000 t (NPFMC, 2009). The overfishing limit for 2010 for the Gulf of Alaska population is 94,100 t, and the TAC is set at 59, 563 t (MSC 2010).

3.00 High: Abundance or biomass is >125% of BMSY or similar proxy.

Points of Adjustment (multiple selections allowed)

-0.25 The population is declining over a generational time scale (as indicated by biomass estimates or standardized CPUE).

-0.25 Age, size or sex distribution is skewed relative to the natural condition (e.g., truncated size/age structure or anomalous sex distribution).

-0.25 Species is listed as "overfished" OR species is listed as "depleted", "endangered", or "threatened" by recognized national or international bodies.

Pacific Cod populations in both the Bering Sea/Aleutian Islands and Gulf of Alaska are listed as 'not overfished' with 'no overfishing occurring,' and no population of Cod is considered to be approaching an overfished condition (NPFMC, 2009). No points were subtracted, since overfishing is not occurring.
-0.25 **Current levels of abundance are likely to jeopardize the availability of food for other species or cause substantial change in the structure of the associated food web.**

In 2000, A Biological Opinion found that the North Pacific groundfish fisheries for pollock, Pacific Cod, and Atka mackerel are likely to jeopardize the continued existence of Steller sea lions (NMFS, 2004). As a result of this report, management measures creating large buffer zones around rookeries were enacted. The efforts to minimize impacts on Steller sea lions are sufficient, and no points were subtracted.

+0.25 **The population is increasing over a generational time scale (as indicated by biomass estimates or standardized CPUE).**

Recruitment varies each year, but abundant spawning stock biomass suggests that if managers keep relative catch low, the population will increase over a generational time scale. More research needs to be done to determine if these assumptions are correct (NPFMC, 2009, NMFS, 2004), so no points were added.

+0.25 **Age, size or sex distribution is functionally normal.**

Age, size and sex distributions are likely normal for Pacific Cod.

+0.25 **Species is close to virgin biomass.**

+0.25 **Current levels of abundance provide adequate food for other predators or are not known to affect the structure of the associated food web.**

**2.25 Points for Abundance**

**HABITAT QUALITY AND FISHING GEAR IMPACTS**

**Core Points (only one selection allowed)**

Select the option that most accurately describes the effect of the fishing method upon the habitat that it affects

1.00 The fishing method causes great damage to physical and biogenic habitats (e.g., cyanide; blasting; bottom trawling; dredging).
2.00 The fishing method does moderate damage to physical and biogenic habitats (e.g., bottom gillnets; traps and pots; bottom longlines).

Most of the Pacific Cod catch is taken with bottom and pelagic trawls and longline gear (NMFS, 2004), but pot and jig gear are also used. In the Bering Sea/Aleutian Islands region, TAC (Total Allowable Catch) is allocated by gear type. Forty-seven percent is allocated to trawl fisheries, 51% is allocated to fixed gear fisheries (i.e., longline and pots), and 2% to jig fisheries. In the Gulf of Alaska region, there are no specific allocations by gear type (NMFS, 2004). Due to the presence of deep water corals, sponges, gorgonians and other organisms located in depths where fishing is occurring (~200m along continental shelf) a score of 2 was awarded for the potential damage caused to these sessile organisms.

3.00 The fishing method does little damage to physical or biogenic habitats (e.g., hand picking; hand raking; hook and line; pelagic long lines; mid-water trawl or gillnet; purse seines).

Points of Adjustment (multiple selections allowed)

-0.25 Habitat for this species is so compromised from non-fishery impacts that the ability of the habitat to support this species is substantially reduced (e.g., dams; pollution; coastal development).

-0.25 Critical habitat areas (e.g., spawning areas) for this species are not protected by management using time/area closures, marine reserves, etc.

-0.25 No efforts are being made to minimize damage from existing gear types OR new or modified gear is increasing habitat damage (e.g., fitting trawls with roller rigs or rockhopping gear; more robust gear for deep-sea fisheries).

-0.25 If gear impacts are substantial, resilience of affected habitats is very slow (e.g., deep water corals; rocky bottoms).

The use of trawling equipment damages deep-water corals, which are important habitats for many demersal fish (Witherell and Coon, 2000). Some corals are hundreds of years old and grow very slowly (<1cm/yr), making the damage to these organisms often irreparable (Andrews, et al. 2009). Points were not subtracted since the NPFMC has implemented management measures and closures to preserve delicate habitats such as deep-water corals.

+0.25 Habitat for this species remains robust and viable and is capable of supporting this species.
Critical habitat areas (e.g., spawning areas) for this species are protected by management using time/area closures, marine reserves, etc.

Rockhopper' trawl gear, which is known to severely impact rocky seafloor habitat, is used by many Cod vessels in the Gulf of Alaska (Alaska Marine Conservation Council, 2002). Fortunately, many deep water habitats are protected from bottom trawling because of their rocky or steep terrain. Areas where bottom trawling is used have reduced benthic diversity and damage to corals, sponges and gorgonians is widespread (Heifetz et al. 2009). Many areas containing known populations of sensitive organisms have been closed to specific gear types.

Gear innovations are being implemented over a majority of the fishing area to minimize damage from gear types OR no innovations necessary because gear effects are minimal. If gear impacts are substantial, resilience of affected habitats is fast (e.g., mud or sandy bottoms) OR gear effects are minimal.

2.25 Points for Habitat Quality and Fishing Gear Impacts

MANAGEMENT

Core Points (only one selection allowed)

Select the option that most accurately describes the current management of the fisheries of this species.

1.00 Regulations are ineffective (e.g., illegal fishing or overfishing is occurring) OR the fishery is unregulated (i.e., no control rules are in effect).

2.00 Management measures are in place over a major portion over the species' range but implementation has not met conservation goals OR management measures are in place but have not been in place long enough to determine if they are likely to achieve conservation and sustainability goals.

3.00 Substantial management measures are in place over a large portion of the species range and have demonstrated success in achieving conservation and sustainability goals.

Effective management is in place in Alaska, where the vast majority of Pacific Cod is caught (NPFMC 1999; PSMFC 1999; NMFS 2004). Management measures include limited entry, seasonal catch quotas, closed areas and bycatch limits. The Marine
Stewardship Council has certified both the Gulf of Alaska and the Bering Sea/Aleutian Islands fisheries as sustainable (MSC 2010).

**Points of Adjustment (multiple selections allowed)**

-0.25 There is inadequate scientific monitoring of stock status, catch or fishing effort.

-0.25 Management does not explicitly address fishery effects on habitat, food webs, and ecosystems.

-0.25 This species is overfished and no recovery plan or an ineffective recovery plan is in place.

-0.25 Management has failed to reduce excess capacity in this fishery or implements subsidies that result in excess capacity in this fishery.

+0.25 There is adequate scientific monitoring, analysis and interpretation of stock status, catch and fishing effort.

Catches are monitored through logbook reports and fish receipts, supplemented with data collected from shoreside sampling and observer coverage. In Alaska, vessels equal to or greater than 125 feet in length must carry at least one NMFS-certified observer on 100% of their sea days, vessels between 60 and 125 feet in length must carry a NMFS-certified observer during at least 30% of their fishing days, and vessels less than 60 feet in length overall are not required to carry observers.

+0.25 Management explicitly and effectively addresses fishery effects on habitat, food webs, and ecosystems.

Closures and management measures have been put in place to protect Steller sea lion habitat, feeding areas and haulouts, essential fish habitat and other habitats of concern (NMFS, 2004; DiCosimo, 1999).

+0.25 This species is overfished and there is a recovery plan (including benchmarks, timetables and methods to evaluate success) in place that is showing signs of success OR recovery plan is not needed.

No recovery plan is needed. Pacific Cod are not overfished and overfishing is not occurring in the Gulf of Alaska and the Bering Sea/Aleutian Islands. Marine Stewardship Council has certified the BSAI and GOA fisheries as sustainable (MSC 2010).

+0.25 Management has taken action to control excess capacity or reduce subsidies that result in excess capacity OR no measures are necessary because fishery is not overcapitalized.

**3.75 Points for Management**
BYCATCH

Core Points (only one selection allowed)

Select the option that most accurately describes the current level of bycatch and the consequences that result from fishing this species. The term, "bycatch" used in this document excludes incidental catch of a species for which an adequate management framework exists. The terms, "endangered, threatened, or protected," used in this document refer to species status that is determined by national legislation such as the U.S. Endangered Species Act, the U.S. Marine Mammal Protection Act (or another nation's equivalent), the IUCN Red List, or a credible scientific body such as the American Fisheries Society.

1.00 Bycatch in this fishery is high (>100% of targeted landings), OR regularly includes a "threatened, endangered or protected species."

Although less than 10% of the total Pacific Cod catch is discarded (NPFMC SAFE, 2009), the longline fishery is known for catching endangered or threatened seabirds. Roughly 15,000 seabirds per year are killed by fishing gear used in the Pacific Cod fishery (NMFS, 2008). The majority of longline-killed seabirds are fulmars, but also includes a large number of albatrosses, gulls, shearwaters, and other species (NMFS, 2004). The fishery kills Laysan, black-foot, and short-tailed albatrosses, which are all on the IUCN Red List of threatened species. The only seabird affected by the Pacific Cod fishery that is listed as endangered by the US is the short-tailed albatross although population impacts are unlikely given current growth in this population (Zador et al. 2008).

2.00 Bycatch in this fishery is moderate (10-99% of targeted landings) AND does not regularly include "threatened, endangered or protected species" OR level of bycatch is unknown.

3.00 Bycatch in this fishery is low (<10% of targeted landings) and does not regularly include "threatened, endangered or protected species."

Points of Adjustment (multiple selections allowed)

-0.25 Bycatch in this fishery is a contributing factor to the decline of "threatened, endangered, or protected species" and no effective measures are being taken to reduce it.

-0.25 Bycatch of targeted or non-targeted species (e.g., undersize individuals) in this fishery is high and no measures are being taken to reduce it.

-0.25 Bycatch of this species (e.g., undersize individuals) in other fisheries is high OR bycatch of this species in other fisheries inhibits its recovery, and no measures are being taken to reduce it.
The continued removal of the bycatch species contributes to its decline.

Measures taken over a major portion of the species range have been shown to reduce bycatch of "threatened, endangered, or protected species" or bycatch rates are no longer deemed to affect the abundance of the "protected" bycatch species OR no measures needed because fishery is highly selective (e.g., harpoon; spear).

As of 2004, revised seabird bycatch regulations have been in effect for the Alaska demersal longline fleet, requiring most vessels over 55 feet to use paired streamer lines, restricting offal discards, and requiring each vessel to have a seabird avoidance plan onboard. Smaller vessels [greater than 26 ft (7.9 m) LOA and less than or equal to 55 ft LOA] must use a single streamer line or, in limited instances, a buoy bag line (Seabird Avoidance Regulations, NOAA). Management efforts have been successful at reducing the amount of seabirds caught by this fishery.

There is bycatch of targeted (e.g., undersize individuals) or non-targeted species in this fishery and measures (e.g., gear modifications) have been implemented that have been shown to reduce bycatch over a large portion of the species range OR no measures are needed because fishery is highly selective (e.g., harpoon; spear).

North Pacific fisheries have implemented measures such as conservative catch quotas, mesh size restrictions, no trawl zones, etc. to reduce bycatch (NPFMC, 1999). Other regulations, such as gear and area/season restrictions, are also used to reduce bycatch (NMFS 2004).

Bycatch of this species in other fisheries is low OR bycatch of this species in other fisheries inhibits its recovery, but effective measures are being taken to reduce it over a large portion of the range.

The continued removal of the bycatch species in the targeted fishery has had or will likely have little or no impact on populations of the bycatch species OR there are no significant bycatch concerns because the fishery is highly selective (e.g., harpoon; spear).

1.50 Points for Bycatch
REFERENCES


Modern fishing vessels catch staggering amounts of unwanted fish and other marine life. It's estimated that anywhere from 8 to 25 percent of the total global catch is discarded, cast overboard either dead or dying.\(^2\) That's up to 27 million tonnes of fish thrown out each year -- the equivalent of 600 fully-laden Titanics. And the victims aren't just fish. Every year, an estimated 300,000 whales, dolphins and porpoises die entangled in fishing nets, along with thousands of critically-endangered sea turtles. Long-line fisheries also kill huge numbers of seabirds. Over 100,000 Albatrosses die this way every year, and many species are endangered as a result of bycatch.

All modern forms of commercial fishing produce bycatch, but shrimp trawling is by far the most destructive: it is responsible for a third of the world's bycatch, while producing only 2% of all seafood.

Shrimp (and many deep-sea fish) are caught using a fishing method called bottom trawling, which usually involves dragging a net between two trawl doors weighing several tons each across the ocean bed. This has a destructive impact on seabed communities, particularly on fragile deep water coral – a vital part of the marine ecosystem that scientists are just beginning to understand.\(^3\) The effect of bottom trawling on the seafloor has been compared to forest clear-cutting, and the damage it causes can be seen from space. The UN Secretary General reported in 2006 that 95 percent of damage to seamount ecosystems worldwide is caused by deep sea bottom trawling.

**Remedies**
What can be done? The next few years will be pivotal for the oceans. If strong measures
are implemented now, much of the damage can still be reversed. In terms of what needs to happen, preventing overfishing is fairly straightforward: first and foremost, scientifically-determined limits on the number of fish caught must be established for individual fisheries, and these limits must be enforced. Second, fishing methods responsible for most bycatch must either be modified to make them less harmful, or made illegal. And third, key parts of the ecosystem, such as vulnerable spawning grounds and coral reefs, must be fully protected.

In practical terms, this means:

- Putting pressure on governments to limit fishing subsidies, estimated at tens of billions of dollars per year. Eliminating subsidies of this scale lowers the financial incentives to continuously expand fishing fleets far beyond sustainability.

- Establishing and expanding Marine Protected Areas (MPAs), areas of the ocean where natural resources are protected and fishing is either restricted or banned altogether (no-take areas). Presently, 1% of the oceans are MPAs. This number needs to be bigger if they are to help reverse the damage done by overfishing. The Save Our Seas Foundation has been actively involved in supporting MPAs through our projects in the Cocos (Keeling) Islands and the Maldives.

- Better monitoring and policing of the fish trade. Pirate fishing continues to grow in scope, and though illegal, fish caught in such operations often end up on our plates.

- Consumers choosing to buy sustainably-sourced seafood and avoiding threatened species. Overfishing is driven by global demand — lowering the demand will lower the damage.
SUDDEN DEATH on the High Seas

Longline Fishing: A Global Catastrophe for Seabirds
Twenty-three species of seabird are in danger of extinction largely because of mortality from longline fishing ... yet the problem can be solved easily and inexpensively.

The large, graceful albatross is perhaps the most venerated of seabirds. The inspiration behind Samuel Taylor Coleridge’s classic poem “The Rime of the Ancient Mariner,” albatrosses have some of the longest wing spans of any birds, and spend much of their lives flying thousands of miles over the open ocean in search of food. However, with demand for large ocean fish at an all-time high, hundreds of thousands of albatrosses and other seabirds are being killed each year by the fleets of longline fishing vessels which now crisscross the world’s oceans. The longliners set lines up to 60 miles long and may use up to 30,000 baited hooks on each set to catch tuna, swordfish, cod, halibut, Patagonian toothfish (Chilean sea bass), and other fish. While the longlines are being set behind the fishing boats, albatrosses and other seabirds grab the bait and become impaled on the barbed hooks, either caught by their bills, or hooked into their bodies or wings. Dragged under the surface, the birds are unable to free themselves and drown.

Data show that this mortality is having a significant impact on populations, with many species showing rapid recent declines. Scientists now fear that unless action is taken, many seabird species will become extinct.

Albatrosses are characterized by low reproductive rates, low natural annual mortality, long life spans, and delayed sexual maturity—traits that make populations extremely sensitive to changes in adult survival.

Longline fishing is considered the most recent and most serious global threat to albatrosses and other procellariiformes.
Seabird populations are being decimated by hundreds of millions of longline hooks...

For an albatross, finding a fishing boat in the open ocean is like finding a free buffet. With their large size, they quickly dominate the feeding frenzy, homing in on the largest morsels: often a squid or fish set on a longline hook. This “smash and grab” feeding ecology selects albatrosses as top victims of longline hooks.

The killing of seabirds in longline fisheries is a global problem from which the U.S. is not immune. In the North Pacific, U.S.-based and other longliners kill tens of thousands of seabirds each year. There are more than 2,500 vessels in the Alaskan longline fleet landing $300 million worth of fish annually and in excess of 140 vessels in Hawaii. In total, these fisheries set more than 210 million hooks each year in total.

Recent data, extrapolated from records kept by official fisheries observers aboard some vessels, show that on average, more than 20,000 seabirds die annually in the Alaskan longline fishery alone. From 1993 through 1999, at least 2,425 Black-footed Albatrosses, 6,721 Laysan Albatrosses, and 13 endangered Short-tailed Albatrosses were killed there. Thousands more fulmars, shearwaters, and other seabirds were also killed. The Alaskan halibut fishery of 1,800 vessels which sets more than 20 million hooks annually has no observers, so it is impossible to know how many more seabirds are killed by halibut vessels.

In the Hawaiian-based longline fishery, at least 8,325 Black-footed Albatrosses and 7,050 Laysan Albatrosses were killed from 1994 through 1999. These mortality figures do not include orphaned chicks that starve after their parents drown on a longline hook, or dead birds that fall into the sea as hooks are retrieved. Last year, the Black-footed Albatross was added to the IUCN-World Conservation Union list of species threatened with extinction: because of longline mortality.

The impact of longlines on seabirds is compounded by a range of other threats that are particular to birds that nest on isolated headlands and islands and forage across the open oceans. Introduced cats, rats, and other predators kill both chicks and adult seabirds at the nest, and may also eat eggs. Species that evolved in isolation have no defense against these ubiquitous predators.

The introduction of pigs, goats, cattle, and rabbits to some islands has also led to the destruction of habitat and seabird nesting burrows. Floating plastic is frequently mistaken for food by albatrosses, which can starve if their digestive tracts become blocked with used lighters, toothbrushes, and other flotsam. A recent study on Sand Island in the northwestern Hawaiian chain showed that 97% of Laysan Albatross chicks had ingested plastic, picked up by their parents and regurgitated as though it was food.

Seabirds also accidentally feed their chicks offal discarded by fishing vessels that still contains fishing hooks. Some species have been persecuted for food, and the Short-tailed Albatross came close to extinction as a result of large-scale slaughter for feathers. This combined onslaught has a cumulative effect that has been catastrophic for many species. The threat from longlining could be the final blow for some species unless action is taken now.
The albatross pictured above is already doomed, having snatched a bait attached to a weighted line that is beginning to sink. It will soon be pulled under the surface to drown.
Three albatross species occur regularly in the North Pacific. All are at serious risk from U.S.-based and other longliners.

**Black-footed Albatross**

This species has recently been classified as Threatened with extinction. This follows a 10% decrease in breeding pairs since 1992 on Midway and Laysan Islands and on French Frigate Shoals, where 77% of the species’ world population nests. Estimates suggest that mortality of this species is at least 2,130 birds per year in U.S.-based fisheries alone. A recent study states that up to 10% of the species’ breeding population is killed on longline hooks throughout the North Pacific each year. U.S. vessels represent a fraction of the total number of boats from many nations that fish in this species’ range. Vessels from these other nations rarely if ever have observers aboard, so these mortality figures are just the tip of the iceberg.

**Short-tailed Albatross**

This is one of the world’s most endangered seabird species with no more than 1,500 birds left of a population that once numbered in the millions. From 1887-1902, an estimated five million were slaughtered for the feather trade. In recent years, at least 13 have been killed in the U.S. Alaskan longline fishery. It is unknown how many have been killed by other fleets, but it is likely to be many more. Toroshima, the current major breeding island off the coast of Japan, is subject to volcanic activity presenting a further threat, although habitat enhancement at this key breeding site has led to a recent population increase. These birds wander the entire North Pacific where they are vulnerable to longline hooks. The species is Federally listed as Endangered.

**Laysan Albatross**

After making a slow recovery from feather trade persecution at the turn of the century, the breeding population of this species has decreased by an alarming 30% since 1992 on Midway and Laysan Islands where more than 90% of the world population nests. Longline mortality is believed to be the primary threat. The species has a similar range to the Black-footed Albatross, but is generally more numerous. They are commonly caught on longlines in the North Pacific, with more than 2,280 killed there by U.S. vessels alone each year. Given the recently released population data on this species, it also clearly qualifies as Threatened with extinction under IUCN-World Conservation Union criteria, although it is yet to be officially listed.
THE PROBLEM

Worldwide, at least 64 seabird species are known to have been killed in longline fisheries. The 23 Threatened* species are shown in red.

Penguins, such as this Gentoo, are capable of diving deep enough to take longline bait even after the lines reach fishing depth. Fortunately, few have been affected so far.

Black-footed Albatross
Campbell Albatross
Black-browed Albatross
Buller’s Albatross
Salvin’s Albatross
Shy Albatross
Chatham Albatross
Atlantic Yellow-nosed Albatross
Indian Yellow-nosed Albatross
Grey-headed Albatross
Sooty Albatross
Light-mantled Sooty Albatross
Southern Giant Petrel
Northern Giant Petrel
Northern Fulmar
Antarctic Fulmar
Cape Petrel
Great-winged Petrel
Grey Petrel
White-chinned Petrel
Spectacled Petrel
Black Petrel
Westland Petrel
Cory’s Shearwater
Flesh-footed Shearwater
Greater Shearwater
Sooty Shearwater
Short-tailed Shearwater
Balearic Shearwater
Mediterranean Shearwater
Manx Shearwater
Wilson’s Storm Petrel
Great Cormorant
European Shag
Gannet
Cape Gannet
Australasian Gannet

Blue-footed Booby
Brown Booby
Great Skua
Subantarctic Skua
Audouin’s Gull
Yellow-legged Gull
Black-headed Gull
Mediterranean Gull
Herring Gull
Lesser Black-backed Gull
Great Black-backed Gull
Glaucous-winged Gull
Black-legged Kittiwake
Common Murre
Thick-billed Murre

Even the once abundant White-chinned Petrel, which is killed in the tens of thousands in southern ocean longline fisheries, has now been classified as Threatened with extinction because of longline mortality. Will it be the next Passenger Pigeon?

*Threatened means listed as Vulnerable, Endangered, or Critically Endangered, under IUCN-World Conservation Union criteria.
Will longlining cause the extinction of albatrosses?

16 of the world’s 21 albatross species are now considered Threatened with extinction under IUCN-World Conservation Union criteria. Longlines are the major continuing threat these species:

- Wandering, Antipodean, Tristan, Amsterdam, Northern Royal, Southern Royal, Waved, Short-tailed, Black-footed, Laysan, Black-browed, Campbell, Buller’s, Shy, Salvin’s, Chatham, Indian Yellow-nosed, Atlantic Yellow-nosed, Grey-headed, Sooty, Light-mantled Sooty.

The exact number of birds killed worldwide on longlines each year is unknown, but is certainly already in the hundreds of thousands. Yet, longline fishing is expanding rapidly around the world. For example, the Brazilian swordfish fleet which kills thousands of Threatened White-chinned, and also Spectacled Petrels, has increased five-fold in the past three years. Ninety percent of this swordfish is exported to the U.S.

From 1997 to 2000, estimates suggest that as many as 333,000 seabirds, including 67,000 albatrosses, were killed in the unregulated “pirate” Patagonian toothfish fishery in the southern oceans. These seabirds include several species Threatened with extinction. Patagonian toothfish is marketed in the U.S. as Chilean sea bass. Out of concern for its population, Whole Food Markets has withdrawn the fish from sale in its stores, although it is still commonly available from other retailers and many restaurants. Both seabirds and toothfish are in decline as a result of this fishery.

96% of the world population of the Black-footed Albatross breeds in the northwest Hawaiian Islands. The U.S. has a special responsibility for protecting this species, which was added to the international Threatened list in 2000 because of declines linked to longline mortality.
Indian Yellow-nosed Albatross

The species has undergone a decline of at least 36% since 1984 at its main breeding site on Amsterdam Island, where approximately 28,000 pairs nest. Scientists believe that longline mortality is responsible for this decline. Up to 600 are killed each year in the western Australian longline fishery. Birds are also killed in the Patagonian toothfish (Chilean sea bass) fishery, and they come into contact with tuna longliners in subtropical waters where they are also killed.

Southern Giant Petrel (juvenile)

The world population has declined 18% from 38,000 pairs to 31,000 pairs over the last decade, probably due to longline mortality. A total of 2,000-4,000 were estimated as having been killed in the unregulated southern ocean Patagonian toothfish (Chilean sea bass) fishery between 1997 and 1998. Even at the lower estimate, the species cannot withstand this level of mortality for much longer.

With his cruel bow he laid full low

The harmless Albatross

SAMUEL TAYLOR COLERIDGE
in population declines for many threatened around the world include:

**Antipodean Albatross (juvenile)**

This species has a small world population of less than 12,000 breeding pairs. A survey on one of its key breeding islands indicated a 63% decline between 1973 and 1997. The species has been caught in significant numbers in the tuna longline fishery in New Zealand waters.

**Wandering Albatross and Spectacled Petrels**

The **Wandering Albatross** is in decline across most of its range because of long-lines. The southern bluefin tuna fishery alone may have accounted for an annual mortality of 2–3% of adults and 14–16% of immatures at South Georgia in the 1980s.

The **Spectacled Petrel** has a world population of a few thousand pairs at most. It is estimated that approximately 700 are being killed on long-lines each year, principally in waters off Brazil where this picture was taken.

See ABC’s website at [www.abcbirds.org](http://www.abcbirds.org) for more details on Threatened seabird populations and declines.
Bird-scaring or “tori” lines (tori meaning bird in Japanese) have been shown to virtually eliminate seabird mortality caused by longlines. They were first developed by Japanese bluefin tuna fishermen who recognized that keeping birds off bait was in their own economic interest, as leaving more bait for fish increases the chances of success. The tori lines are mounted on poles at the stern of the boat, and are connected to a floating buoy that is dragged behind the vessel. Colored streamers are attached to the lines, and these flap erratically in the wind above the area where the bait enters the water. When the longlines are properly weighted, they sink immediately behind the boat and the flapping streamers scare the birds away. By the time the baited hooks are beyond the streamer zone, they have already sunk below the depth where they can be reached by most seabirds.

In Hawaii, where lines are set at shallower depths than in Alaska, regulations are in place that require thawing the bait so it sinks more quickly, dyeing bait blue so it is less visible to birds, adding weights so the lines sink more quickly, setting lines at night when fewer birds are feeding, and strategically discharging offal during line setting, so that birds are attracted away from the boat’s stern where the lines are set (or not discharging offal at all, so fewer birds are attracted to the boat). These measures also have been shown to be effective means of reducing seabird mortality.

The use of bird-scaring lines and other avoidance measures, ensures that we can still enjoy seafood, knowing that no albatrosses or other sea birds have had to die to bring the catch to table. Japanese southern ocean tuna longliners setting 481 million hooks, killed an estimated 44,000 albatrosses annually in the early 1980s.
New study shows streamer lines virtually eliminate seabird mortality.

A rigorous two-year study by the University of Washington on various seabird avoidance measures aboard Alaskan longliners documented that paired streamer lines (costing $260 delivered), virtually eliminate all albatross and Northern Fulmar mortality. Other seabird mortality also is nearly eliminated. One southern bluefin tuna recently brought $173,600 at a Tokyo fish market—enough to provide bird-scaring lines for 667 vessels.

The study also finds that these bird-scaring lines, that form a flapping curtain over baited lines when they are set, have no effect on the catch of targeted fish, nor do they increase the catch of other non-target species. Neither do they pose a safety risk to fishermen. The study recommends that all Alaskan longliners be required to employ these paired streamer lines, and that all bottom fishing longliners around the globe also employ streamer lines when setting baited lines, as well as eliminate offal discharge over baited lines during setting. To view the full study, dated August 31, 2001, complete with details for the design of materials for paired streamer lines. See:

More than 500 paired streamer lines have been given to Alaskan longline vessels thanks to a grant program funded by the U.S. Fish and Wildlife Service. Additional grant funds are still available to outfit more vessels (see p. 13).
Seabird deaths on longlines: an international environmental problem where the U.S. can lead in eliminating seabird mortality with no negative impact on commercial fisheries.

In October 1996, spurred by increasing evidence of declines in albatross and other seabird populations, the IUCN-World Conservation Union (an inter-governmental organization of which the U.S. is a member), adopted a resolution urging nations to “adopt the goal of eliminating seabird by-catch within longline fisheries” and “implement seabird by-catch reduction measures immediately within longline fisheries.” The U.S. government supported this call for action. Previously, an international treaty, the Convention for the Conservation of Antarctic Marine Living Resources, required all longliners fishing below 300 degrees South to use a bird-scaring line, set lines at night, add greater line weights, and strategically discharge offal. Subsequently, the United Nations Food and Agriculture Organization (FAO) adopted an International Plan of Action for Reducing Incidental Catch of Seabirds. The U.S. fully supported and voted for this international protocol. Unfortunately the protocol is voluntary, and the deadline for each longline nation to assess its fisheries for seabird mortality, and to prepare plans to minimize seabird deaths passed in February 2001, with only two nations (U.S. and Japan) submitting Plans. Most longlining nations have still not even assessed the extent of seabird mortality in their fisheries, and have done little if anything to avoid killing seabirds.

Furthermore, the U.S. Plan of Action is weak, listing no specific avoidance measures, and providing an additional two years for an assessment of the problem that is already well documented in all but the Alaskan halibut fishery (where observers are not yet required). Because the plan does not require observers to monitor seabird mortality aboard vessels, there seems to be little chance that the halibut fishery assessment will take place unless further action is taken. In fact, existing fishery regulations already provide better protection for seabirds than the Plan suggests, especially in Hawaii where specific avoidance measures are now required.

Congress and the U.S. National Marine Fisheries Service should act now to improve regulations and require that effective avoidance measures are employed by all U.S. longline vessels to protect seabirds. The two-year National Marine Fisheries Service-funded Alaskan study recommended required use of paired streamer lines on all Alaskan and global bottomfish vessels. The Administration should also call on other fishing nations to adopt effective National Plans of Action to avoid seabird mortality.

It is vital that the U.S. takes an active role in pressing for improved protection of albatrosses and other seabirds in the world’s longline fisheries. The survival of the great albatrosses depends on it.
Monterey Bay Aquarium® Seafood Watch

The Monterey Bay Aquarium Seafood Watch program creates science-based recommendations that help consumers and businesses make ocean-friendly seafood choices. Carry this guide with you and share it with others to help spread the word.

The seafood recommendations in this guide are credited to the Monterey Bay Aquarium Foundation ©2016. All rights reserved. Printed on recycled paper.

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• Sign up for our e-news
• Visit www.seafoodwatch.org

Take Action
• Be part of the solution and make a difference for our ocean.
• Start with Best Choices then check the other columns—your favorite seafood could be in more than one.

Best Choices
Buy first, they’re well managed and caught or farmed in ways that cause little harm to habitats or other wildlife.

Good Alternatives
Buy, but be aware there are concerns with how they’re caught or farmed.

Avoid
Take a pass on these for now, they’re overfished or caught or farmed in ways that harm other marine life or the environment.

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Visit us online or download our app for a comprehensive list of our recommendations.

<table>
<thead>
<tr>
<th>BEST CHOICES</th>
<th>GOOD ALTERNATIVES</th>
<th>AVOID</th>
</tr>
</thead>
</table>

**BEST CHOICES**
- Abalone
- Arctic Char (farmed)
- Barramundi (US & Vietnam farmed)
- Bass (US hook and line, farmed)
- Catfish (US)
- Ciams, Mussels & Oysters
- Cod: Pacific (AK)
- Crab: King, Snow & Tanner (AK)
- Lobster: Spiny (Mexico)
- Prawn: Spot (AK & Canada)
- Rockfish (AK, CA, OR & WA)
- Sablefish/Black Cod (Canada farmed & AK)
- Salmon (AK & New Zealand)
- Sanddab (CA, OR & WA)
- Sardines: Pacific (Canada & US)
- Scallops (farmed)
- Shrimp (US farmed & AK)
- Tilapia (Canada, Ecuador & US)
- Trout: Rainbow (US farmed)
- Tuna: Albacore (Pacific troll, pole and line)
- Tuna: Skipjack (Pacific troll, pole and line)

**GOOD ALTERNATIVES**
- Branzino (Mediterranean farmed)
- Cod: Pacific (Canada & US)
- Crab: Blue & Dungeness (US)
- Groupers: Black & Red (US)
- Halibut: Atlantic (farmed)
- Lobster (Bahamas & US)
- Mahi Mahi (US troll & Ecuador)
- Monkfish (US)
- Octopus (Portugal & Spain, pot, trap)
- Pollock (Canada longline, gillnet & US)
- Salmon (Canada, CA, OR & WA wild)
- Scallops: Sea (wild)
- Shrimp (Canada & US wild, Ecuador & Honduras farmed)
- Squid (Mexico & US)
- Swordfish (US)
- Tilapia (China, Indonesia, Mexico & Taiwan)
- Tuna: Albacore (US longline)
- Tuna: Skipjack (free school, imported troll, pole and line, and US longline)
- Tuna: Yellowfin (free school, HI longline, and Pacific & Indian Ocean troll, pole and line)

**AVOID**
- Abalone (China & Japan)
- Basa/Pangasius/Swai
- Cod: Atlantic (Canada, CA, OR & WA)
- Cod: Pacific (Japan & Russia)
- Crab (Russia)
- Haddock: Atlantic (wild)
- Lobster: Spiny (Belize, Brazil, Honduras & Nicaragua)
- Mahi Mahi (Costa Rica, Guatemala & Peru)
- Orange Roughy
- Pollock (Canada trawl)
- Salmon: Atlantic (farmed)
- Sardines: Asian (Mediterranean)
- Sharks
- Shrimp (imported)
- Squid (China, India & Thailand)
- Swordfish (imported longline)
- Tuna: Albacore (except US troll, pole and line, and longline)
- Tuna: Bluefin
- Tuna: Skipjack (imported purse seine)
- Tuna: Yellowfin (Atlantic, pole and line)
- Albacore (Pacific troll, pole and line)
- Brainfish (Mediterranean farmed)
- Cod: Pacific (AK & Canada)
- Crab: Blue & Dungeness (US)
- Haddock: Atlantic (farmed)
- Lobster: Spiny (Belize, Brazil, Honduras & Nicaragua)
- Mahi Mahi (Costa Rica, Guatemala & Peru)
- Orange Roughy
- Pollock (Canada trawl)
- Salmon: Atlantic (farmed)
- Sardines: Asian (Mediterranean)
- Sharks
- Shrimp (imported)
- Squid (China, India & Thailand)
- Swordfish (imported longline)
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- Tuna: Bluefin
- Tuna: Skipjack (imported purse seine)
- Tuna: Yellowfin (Atlantic, pole and line)

To use your guide: 1. Cut along outer black line 2. Fold on grey lines

Start with Best Choices then check the other columns—your favorite seafood could be in more than one.

Best Choices
Buy first, they’re well managed and caught or farmed in ways that cause little harm to habitats or other wildlife.

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Birth of the Haudenosaunee

By Dehowâhda-dih - Bradley Powless, Eel Clan, Onondaga Nation

Journey of the Peacemaker

Over a thousand years ago on the shores of Onondaga Lake, in present day central New York, democracy was born. The Seneca, Cayuga, Onondaga, Oneida, and the Mohawk people had been warring against each other and there was great bloodshed. These five nations had forgotten their ways and their actions saddened the Creator.

The Creator sent a messenger to the people so that the five nations could live in peace. His name was the Peacemaker.

The Peacemaker carried powerful words of peace to the five nations. He traveled in a canoe of white stone to show that his words are true.

One of the first to join the Peacemaker’s vision was an Onondaga named Hiawatha. Hiawatha was in mourning with the death of his daughters. The Peacemaker used Hiawatha’s purple and white wampum strings to clear his mind to think clearly again. Together they traveled to the other nations persuading them to put down their weapons of war.

The Peacemaker then sought out the most evil people of the five nations. He knew that for peace to endure, these men needed to be turned into good-minded leaders.

The Peacemaker had already successfully convinced the Mohawks, Oneidas, Cayugas, and Senecas to join the Great Peace; however an Onondaga named Tadodaho stopped the completion of the vision. He was the most evil person of the time. Tadodaho was so evil that his body was twisted and snakes grew from his head.

The Peacemaker gathered all of the chiefs. They traveled together to convince him to join the peace. Only then did Tadodaho accept the Peacemaker’s message and his special duty of caretaker of the council fire of the Haudenosaunee. His body and hair straightened and he became the last of the fifty chiefs. The five nations were united at last!

The Peacemaker showed them that one nation can be easily broken, like a single arrow; but five nations bound together, like five arrows, will become strong. The Peacemaker further symbolized this union of peace by selecting the white pine tree. The tree’s pine needles are also bundled into groups of five to remind us of the Great Peace. The Peacemaker uprooted a great white pine tree leaving a great hole. Everyone then buried their hatchets of war and replanted the tree. The Peacemaker placed an eagle on top of the Tree of Peace. The eagle is there to warn the Haudenosaunee of any dangers to this Great Peace.

A wampum belt made of purple and white clam shells was created to record the event. Four squares (starting from the east) representing the Mohawk, Oneida, Cayuga and Seneca Nations with the Great Peace Tree (representing the Onondaga) in the center. This became known as the Hiawatha Belt which showed the union of the five Nations.
Coming Together

The Onondaga Nation is a sovereign nation with its own government. This began when the Peacemaker replanted the Great Tree of Peace. It has been in existence for countless centuries.

The entire Haudenosaunee (Ho-den-no-sho-ne) has fifty Hoyane (Ho-ya-nay) or chiefs among the five nations. The Hoyane are all considered equal. To show that they are leaders, the Peacemaker places the antlers of the deer on the Gustoweh (Gus-to-wah) or headdress of every Hoyane. When in council, every chief has an equal responsibility and equal say in the matters of the Haudenosaunee. The Peacemaker envisioned the chiefs holding arms in a large circle. Inside the circle are the laws and customs of our people. It is the responsibility of the Hoyanet to protect the people within the circle and to look forward Seven Generations to the future in making decisions.

At Onondaga, there are fourteen Hoyane, including Tadodaho. Each chief works with his female counterpart, the Clan Mother. In council they are the voice of the people of their clan.

The council is divided into three benches or groups. Each bench must work together on decisions for the nation. When a decision by council has been agreed upon by all three benches, it comes with the backing of all of the chiefs in agreement. It is said that the Council is “Of One Mind”. There is no voting.

Since that first meeting with the Peacemaker, the Onondaga Nation Chiefs and Clan Mothers continue to govern by the ways given by the Peacemaker. This makes the Haudenosaunee and the Onondaga Nation the oldest continuous democratic government in North America.
A NOTE ON VOCABULARY INSTRUCTION
One way to Align Vocabulary Instruction to the Common Core

For an example of research based vocabulary instruction, refer to Dr. Anita Archer’s video example with a sixth grade class: http://explicitinstruction.org/?page_id=317. This will support your use of the PowerPoint for vocabulary in Unit 1 Lesson 3. Taking the time to emphasize and ensure student comprehension of vocabulary saves time down the road and strengthens student foundations of background knowledge and vocabulary acquisition.

This curriculum does not provide PowerPoints and comprehensive activities for vocabulary in every lesson or unit, but teachers can use Dr. Archer’s example, the instructions below, and the PowerPoint that corresponds to Unit 1 Lesson 3 to create vocabulary lessons that will engage students and leave them better prepared to tackle complex reading passages.

When presenting vocabulary, it is important to address the following steps. Follow these steps when implementing the PowerPoint for Unit 1 Lesson 3 Vocabulary. It may be helpful to practice ahead of time.

1. Pronounce the word when you teach it. It may be helpful to pronounce it and have students repeat it chorally several times.
2. Share a student-friendly definition or explanation of the word, and make sure the words you use to provide the definition or explanation are familiar to the students with whom you are working.
3. Use examples (additional sentences) to clarify the word or provide the word in different contexts.
4. Ask students questions about the vocabulary word. Use non-examples of the word.
5. Note word relatives (for “righteousness,” you may use “right” “righteous” “righteously” and call attention to how the word “right” may help students make meaning of “righteous”)
6. Have students keep a word journal that posts the definition or a synonym that helps students remember the word.
### “Birth of the Haudenosaunee”

<table>
<thead>
<tr>
<th>Questions Day 1</th>
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<tbody>
<tr>
<td>Why did the Creator send the Peacemaker to the five nations?</td>
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<tr>
<td>Why did Hiawatha join the Peacemaker?</td>
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<td>Using evidence from the text, what three things do we find out about the Peacemaker?</td>
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<td>How does this illustration reflect what we have read in this section?</td>
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</table>

The Council with Tadodaho at the Time the League Was Started, Painting by Ernest Smith. From the collections of the Rochester Museum & Science Center, Rochester, NY.

**What is the purpose of the Hiawatha Belt?**
GRADE 4: MODULE 1A: UNIT 1: LESSON 3
“Birth of the Haudenosaunee”
The Creation of a Nation

### Long-Term Targets Addressed (Based on NYSP12 ELA CCLS)

| I can explain what a text says using specific details from the text. (RL.4.1) |
| I can engage effectively in a collaborative discussion. (SL.4.4) |

### Supporting Learning Targets

- I can notice new ideas and wonder about how nations are created
- I can answer questions using specific details from a text.
- I can demonstrate what I know by contributing to discussions.

### Ongoing Assessment

- Student-created graphic organizers

### Agenda

<table>
<thead>
<tr>
<th>1. Opening</th>
<th>Teaching Notes</th>
</tr>
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<tbody>
<tr>
<td>A. Engaging the Reader: Mystery Activity (10 minutes)</td>
<td>In this lesson, students will read “Birth of the Haudenosaunee”, a story that describes the creation of the Great Peace and the Haudenosaunee nation. This lesson works toward providing students with a basic understanding of the Peacemaker and his journey to bring peace, as well as an introduction to some of the symbols of the Haudenosaunee culture. Students will interpret the symbols and be able to use those symbols to support their understanding of the text.</td>
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<tr>
<th>2. Work Time</th>
<th>* Students will begin the lesson with a Gallery Walk of symbols that is meant to generate questions about the Haudenosaunee, followed by a class debrief where students identify the symbols they know and share their “wonders” about the symbols that they are not familiar with. This will prepare the class for the in-class reading that will reveal the symbols with which they may be unfamiliar.</th>
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</thead>
<tbody>
<tr>
<td>A. Getting Started Reading about the Haudenosaunee: Vocabulary Instruction and Map (10 minutes)</td>
<td>This lesson introduces a simple routine of I Notice/I Wonder. Students practice this with the Gallery Walk.</td>
</tr>
<tr>
<td>B. Masterful Reading and Close Reading of “Birth of the Haudenosaunee” (30 minutes)</td>
<td>Review the Think-Pair-Share, Cold Call, and Fist to Five protocols (Appendix 1).</td>
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<tr>
<th>3. Closing and Assessment</th>
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<tbody>
<tr>
<td>A. Debrief and Exit Ticket(10 minutes)</td>
<td>In advance, practice the correct pronunciation of any unfamiliar words from the text.</td>
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<tr>
<th>4. Homework</th>
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</table>
### Lesson Vocabulary
- details, contribute, discussion, notice, wonder, oral tradition, wampum, Iroquois, nations, symbol, Haudenosaunee
- democracy, mourning, sought, vision, caretaker, persuading, endure, symbolized, uprooted

### Materials
- I Notice/I Wonder note-catcher for Gallery Walk (one per student, and one to project on document camera)
- Gallery Walk images (see Supporting Materials)
- Document camera
- Vocabulary Power Point slides and guidance (see Supporting Materials)
- Student copies of “Birth of the Haudenosaunee”
- “Birth of the Haudenosaunee” Text-Based Answers handout
- NYS County Map
- Highlighters or colored pencils
- Index cards
- Video: What is Wampum?: [https://www.youtube.com/watch?v=ByzAfNXUbEQ](https://www.youtube.com/watch?v=ByzAfNXUbEQ)

### Opening

**A. Opening: Engaging the Reader: Gallery Walk (10 minutes)**

- Share the learning targets:
  * “I can answer questions using specific details from the text.”
  * “I can show what I know by contributing to discussions.”
  * “I can notice new ideas and wonder about how nations are created.”
- Help students understand the meaning of “specific details,” “showing what they know,” “contributing,” and “discussions.”
- Tell students that at the end of the lesson they will share how they did moving toward the learning target.
- Distribute the **I Notice/I Wonder note-catcher** to each student and project it on a document camera (or make a chart of it on chart paper or on your board).
- Model Notice and Wonder for students. ("I notice that this flag is purple I wonder what the white markings mean?")
- Begin Gallery Walk, and as the students move in groups of three or four, encourage them to ask questions and record ideas.

### Meeting Students’ Needs

- Modeling provides a clear vision of the expectation for students. Teacher may model by saying: “I notice white squares on the picture or “I wonder why the background purpley-blue.”
on their note-catchers.

- Ask students to Think-Pair-Share about some of the images. Students may add any new notices or wonders from their partners to their own note-catcher. Each student pair should select one notice or wonder and be prepared to share with the class. Call on several pairs of students to add one notice and several pairs to share one wonder to the projected note-catcher.

- Explain to students that symbolism is giving special meaning to objects, things, relationships or events. So when they see something like a red heart, what does that symbolize or represent? Ask students if they recognize the flags. Ask, “What do they symbolize?” Call on students for responses. Debrief on where and when we see symbols and why they are important.

- The Haudenosaunee symbols will likely not be as familiar. Inform students that these symbols will begin to be explained in the readings that we do throughout the module, and are sacred symbols to the Haudenosaunee people. If students are familiar with these symbols, encourage them to share their meanings.
## Work Time

### A. Getting Started Reading about the Haudenosaunee: Vocabulary Instruction and Map (10 minutes)

- **Vocabulary**: Use the Vocabulary PowerPoint to teach the definitions of the challenging words from “Birth of the Haudenosaunee”. All of the words do not have to be reviewed. You may choose to teach the words that you feel will most benefit your students. See guidance in Supplemental Materials for how to use the PowerPoint.

- Using a document camera or Smart board, display the map of NYS labeled “1722” found in Supplemental Materials. This map indicates the territory of the Haudenosaunee in 1722 in the area that is now New York. Display the map of NYS’s counties and ask them to identify where they live in the state. Give students a moment to compare what is similar or different about the labels for each region. If students recognize a connection to the names, explore the connection briefly as a class. Explain that before Europeans came to this continent there were people already living in what is now New York, and we are going to hear about some of their nations in the reading today and throughout the module. Say the names with the students, correcting pronunciation of Mohawk, Onondaga, Cayuga, Seneca, Oneida and Tuscarora.

### B. Masterful Reading and Close Reading of “Birth of the Haudenosaunee” (35 minutes)

- Inform students that they are going to read this story at least twice and some sections of it even a few times. Point out to students that strong readers almost always reread in order to understand a text more fully. They will be practicing this a lot this year. Sometimes our understanding of a text can change as we learn more about it.

- Distribute copies of “Birth of the Haudenosaunee” to each student.

- Read aloud entire “Birth of the Haudenosaunee” while students follow along.

- Place students into pairs.

- Hand out the worksheet for Lesson 1 “Birth of the Haudenosaunee” Text-based Answers.

- Instruct student pairs to re-read the section of the text called “Journey of the Peacemaker”. Students should underline or highlight details they think are important and circle words they do not understand. They should then answer the questions on the worksheet with their partners and also try to figure out any unknown words together. Circulate to provide assistance as students work.

- Before reviewing the text-based questions, ask: “Are there additional vocabulary words that you and your partner are stuck on?” Help students to define the words. Make sure students answer the following questions and share out/discuss as a class before moving forward:

### Meeting Students’ Needs

- Graphic organizers engage students more actively and the necessary scaffolding that is especially helpful for learners with lower levels of language proficiency.

- It may be helpful to model a think-pair-share with another student to show how the process works.

- It may be helpful for some students to use a straight edge to follow along the lines in the text. This can also serve as an indication to teachers regarding student comprehension. Model this process if you think it would support your students.

- Consider having students circle or highlight words that they cannot figure out as they reread the text with their partner. This activity should not happen during the masterful read because we want students to focus on what they know and not be focusing on what they don’t know.
Why did the Creator send the Peacemaker to the five nations?

Why did Hiawatha join the Peacemaker?

Using evidence from the text, what three things do we find out about the Peacemaker?

How does this illustration reflect what we have read in this section?

What is the purpose of the Hiawatha Belt?

End the class with a brief discussion about the type of person the Peacemaker was and how he helped to unite the five nations clarifying for students as needed.

The remainder of the “Birth of the Haudenosaunee” will be read in Lesson 2.

One way to assess student fluency and comprehension at this point in the year is to have them whisper read the first paragraph in pairs together, which allows you as you move around the class to notice fluency and comprehension, and will create a more consistent pace in the class.

Closing and Assessment

A. Debrief and Exit Ticket (10 minutes)

- Ask the students if they have met the learning targets “I can contribute to class discussions” and “I can answer questions using specific details from the text.”

- Students can use the Fist to Five protocol. This self-assessment helps students to rate themselves on a continuum from zero (fist), meaning far from the target, to five (five fingers), having solidly met the target. Call on a few students to provide evidence for the rating they gave themselves.

- Distribute one index card to each student. Show students the video “What is Wampum?” Then ask, “How does this video enhance your understanding of the Peacemaker?” Students will write their responses on the index cards and hand it in at the end of the class.

- Review student responses to make sure they can make connections between the video and the text. If necessary, show the video again at the beginning of the next lesson and lead a class discussion on how the text and video connect.

Homework

- Students should continue their independent reading related to this unit.
Qualitative Features of Complex Text

- Subtle and frequent transitions
- Multiple /subtle themes and purposes
- Density of information
- Unfamiliar settings, topics, events
- Lack of repetition, overlap, or similarity of words and sentences
- Complex sentences
- Uncommon vocabulary
- Lack of words, sentences or paragraphs that pull the meaning together
- Longer paragraphs
- Any text structure which is less narrative
- A mix of text structures

Creating Text-Dependent Questions

1. Identify the standards that are being addressed
2. Identify the core understandings and key ideas of the text
3. Target small but critical-to-understand passages
4. Target vocabulary and text structure
5. Tackle tough sections head-on: notice things that are confusing and ask questions about them
6. Create coherent sequences of text-dependent questions
7. Create the assessment
Syntax Definition (1818)

“Syntax is a word which comes from the Greek. It means, in that language, the joining of several things together; and, as used by grammarians, it means those principles and rules which teach us how to put words together so as to form sentences. It means, in short, sentence-making. Having been taught by the rules of Etymology what are the relationships of words, how words grow out of each other, how they are varied in their letters in order to correspond with the variation in the circumstances to which they apply. Syntax will teach you how to give all your words their proper situations or places, when you come to put them together into sentences.”

William Cobbett, A Grammar of the English Language in a Series of Letters: Intended for the Use of Schools and of Young Persons in General, but More Especially for the Use of Soldiers, Sailors, Apprentices, and Plough-Boys, 1818

My definition:
The juicy sentence is a strategy developed by Lily Wong Fillmore, specifically to address the needs of ELL’s and accessing complex text. But I have found it to be a useful tool for all students. The juicy sentence provides the opportunity for students to gain a deeper understanding of the text by breaking apart a complex sentence. Through this close look at the sentence, many aspects of language can be taught in context. Here is my version of how the juicy sentence can be used in a classroom:

- After engaging the students in a close read using an exemplar, a BAP lesson, a RAP lesson, or even a class read-aloud, I choose a sentence worthy of our time, which may include: vocabulary worth investigating further, complex structure, language features that match grade-level language standards, etc.
- I write the sentence on the board and ask the students to copy the sentence verbatim. Then the students are instructed to write what they think the sentence means. We then discuss the meaning of the sentence, which will usually lead to a deeper discussion of how that sentence relates to the story we had read. I also take this opportunity to discuss any vocabulary and the use of context clues to determine the meaning (other instructional opportunities may come up for vocabulary—word replacement, etc.)
- Then I have the students write about “anything else they notice” about the sentence. This is difficult at first, as they need some modeling as to what this means. This is when I really go into the language standards—circling verbs and discussing tense, circling words with affixes and discussing meanings, base words, etc., circling punctuation and discussing purpose, etc. ... The grade-level language standards really drive this learning.
- The last part I ask the students to do is to rewrite the sentence using the same structure as the author. For example, if the sentence uses quotations, the students will include the same quotations. If the sentence is a compound sentence, the students will write a compound sentence. The topic does not have to mimic the original sentence, and actually, I think it shows a deeper understanding when it doesn’t.

Here is an example from a fifth-grade story found in Houghton Mifflin Harcourt’s *Katie’s Trunk*:

*My breath got caught somewhere midst my stomach and chest, and I could not get it back.*
This sentence gives the opportunity to discuss how it relates to the overall meaning of the story, to determine the meaning of *midst* using context clues, to teach about compound sentence structures, and verb endings. Another version of how to use a juicy sentence is described in the article found on this website:


After using the juicy sentence to examine syntax, you can take this instruction further. Judith Hochman uses kernel and complex sentences to expand students’ understanding of syntax in her book *Teaching Basic Writing Skills*. A kernel is a sentence broken into the smallest sentence possible (Volcanoes erupt). The complex sentence expands a kernel into a more detailed, complex sentence. You can begin this understanding by tearing the juicy sentence into a kernel and expanding it using the student’s own language. Then this learning can be connected to sentence expansion with the students’ personal writing. Hochman’s book also gives specific examples to kindergarten-sixth grade.

More information about Lily Wong Fillmore’s work can be found in this article:
(http://ell.stanford.edu/sites/default/files/pdf/academic-papers/06-LWF%20CJF%20Text%20Complexity%20FINAL_0.pdf)
## Multiple Choice Question Stems

**Aligned by Standard**

Extracted from the June 2014, August 2014, and January 2015 NYS Common Core Regents Exams

<table>
<thead>
<tr>
<th>RI.2</th>
<th>RI.3</th>
<th>RI.4</th>
<th>RI.5</th>
<th>RI.6</th>
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<tbody>
<tr>
<td>Which statement from the text best summarizes the central idea?</td>
<td>The author’s anecdote about ___ serves to introduce a ___</td>
<td>The speaker repeats the word ___ throughout the ___ in order to ___</td>
<td>The primary purpose of lines ___ through ___ is to clarify the ___</td>
<td>The references to ___ in lines ___ through ___ contribute to the author’s purpose by suggesting that ___</td>
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<td>With which statement would the author of this text most likely agree?</td>
<td>How do lines ___ through ___ develop a claim?</td>
<td>What effect is created by the use of irony in line ___ and lines ___ through ___?</td>
<td>The authors reference to ___ is used to help clarify ___</td>
<td>The function of lines ___ through ___ is to ___</td>
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<tr>
<td>With which statement would the authors most likely agree?</td>
<td>The central idea of the ___ paragraph focuses on the ___</td>
<td>Which statement best clarifies the sentence in lines ___ through ___?</td>
<td>The authors attempt to engage the audience through the use of ___</td>
<td>Lines ___ through ___ establish a ___</td>
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<td>The central idea of the ___ paragraph focuses on the ___</td>
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<td>Which statement from the text best summarizes the central idea of paragraph ___?</td>
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<td>Which purpose is not referenced in the ___?</td>
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<td>The sentence ___ contributes to the central theme by...?</td>
<td>In this passage, the conversation between ___ and ___ (lines ___ through ___) serves to</td>
<td>Lines ___ through ___ suggest that the ___ people</td>
<td>The comparison in lines ___ and ___ emphasizes the ___</td>
<td>The poet’s purpose in the poem can best be described as</td>
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<td>As used on Line ( ) the phrase ___ means that things are ___</td>
<td>Which analysis is best supported by the details in lines ___ through ___ of the text?</td>
<td>Which word best describes the narrator’s tone ___</td>
<td>Why does &lt;character&gt; not “character thought/dialogue” in line ___</td>
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<td>The primary function of lines ___ is to ___</td>
<td>The author’s description of the conversation between ___ and ___ in lines ___ through ___ serves mostly to</td>
<td>The reference to [character’s] “descriptive trait” and “descriptive trait” in line ___ reveals his/her ___</td>
<td>The author’s purpose &lt;in the first stanza&gt; is to</td>
<td>Lines ___ through ___ illustrate the narrators belief that ___</td>
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<td>Which quotation best reflects a central theme in the text?</td>
<td>The conversation with ___ (lines ___ through ___) leaves the narrator with a sense of</td>
<td>The phrase “___” (line) emphasizes the narrator’s ___</td>
<td>What is the effect of withholding ___</td>
<td>What is most likely not a purpose of the repetition of the phrase “___”?</td>
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<td>The ___ references throughout the poem serve to</td>
<td>How do the words ...(line), “<em><strong>” (line), and “</strong></em>” (line) advance the author’s purpose</td>
<td>The author’s description of ___ stresses the ___</td>
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<td>The description of ___ in lines ___ through ___ emphasizes the idea of</td>
<td>The examples presented in lines ___ through ___ help the reader understand</td>
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<td>Which word best describes the narrator’s tone ___</td>
<td>The author structures the text around references to ___</td>
<td>Why does &lt;character&gt; not “character thought/dialogue” in line ___</td>
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