Lesson Plan
K-2 COMING FULL CYCLE

Essential Questions:

1. What are the stages of a life cycle?
2. How do different animals' life cycles differ?

GSE Standards:

- **S2L1**: Obtain, evaluate, and communicate information about the life cycles of different living organisms.
- **SKL2**: Obtain, evaluate, and communicate information to compare the similarities and differences in groups of organisms.
- **1.MDR.6**: Use appropriate tools to measure, order, and compare intervals of length and time, as well as denominations of money to solve real-life, mathematical problems and analyze graphical displays of data to answer relevant questions.

NGSS Standards:

- **1-LS3-1**: Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Materials:

- Life Cycle Cards, printed and cut
- Timeline Strips
- "Scarlet's Big Debut" Video
- "Penguin's First Pip" Video

Vocabulary:

- Life Cycle
- Fledgling
- Hatchling
- Juvenile
- Adult

Lesson Plan
K-2 CREATURE FEATURES

Background:

South African Penguins

- African penguins pair-bond for life, and usually have two broods, or nests, per year together. They share the responsibility of sitting on the nest and raising their young.
- Two, although sometimes three to four, small eggs are laid and incubated for 38-42 days.
- When one parent is incubating the egg, the other will head out to sea to forage or collect vegetative nesting material. Each parent has an incubation 'pouch' on the body to keep the incubation temperature constant.
- The eggs typically hatch two days apart, and the parents will continue to brood the chicks for about 15 days until they can regulate their body temperature.
- For the first 30 days, baby chicks are guarded by their parents. However, as they grow, they may form groups of chicks, called crèches, with up to 55 chicks!
- For the first three months of their lives, penguin chicks rely on their parents for food, which they receive through beak-to-beak regurgitation.
- Molting is when penguins lose and replace all of their feathers. The first molt occurs after 14 days followed by a second molt at 40–60 days, and juvenile plumage develops at 70–80 days.
- The chicks are fully fledged after 70–90 days. The fledgling juveniles will go out to sea on their own and return to their colony of birth after about 12– 22 months to molt into their adult plumage.
- Juveniles are considered full adults then, and will start breeding between four to six years later, starting the cycle of life over again!
- The life expectancy for penguins in their natural habitat is up to 27 years.

Lesson Plan
K-2 CREATURE FEATURES

Background:

Beluga Life Cycle

- Belugas are mammals, so they give live birth. Gestation typically ranges from 15 to 16 months with births typically occurring April-July.
- Belugas will give birth to one calf at a time, with females giving birth every 2-4 years. On average, a birth may last eight hours.
- Calves are born gray, which helps them camouflage into their mother's shadow. Usually by the time they are about 5 years old, they are white!
- The average calf birth weight is 119-145 pounds, and as an adult they can weigh between 1100-2500 pounds.
- Calves are dependent on their mother's milk for the the first 6-12 months of life, but can continue to nurse until they are 2 years old.
- Females will mature between 5-7 years of age, and males between 8-9 years of age.
- Belugas form groups, called "pods", of two to several dozen individuals. While pods are very fluid, the mother and calf bond is thought to be a central social relationship for belugas.
- The average life span of a beluga is 30-35 years.

Sea Lion Life Cycle

- Sea lions reach maturity by 4-5 years of age and begin mating in the late spring to early fall. This means that most births occur in June!
- The gestation period lasts about 11 months, with females usually giving birth to a single pup.
- The mother will nurse the pup for about 8 days, and then forage for 2-3 days at a time, coming back to nurse.
- Pups gather in groups, called colonies, and spend their time either resting or exploring.
- The pup and mother use specific calls to identify each other. After birth, they will spend time nuzzling and vocalizing to each other, imprinting on their memories exactly what one another smells and sounds like.

EDUCATION
GEORGIA AQUARIUM

Lesson Plan
K-2 CREATURE FEATURES

Background:

Sea Lion Life Cycle

- As sea lions grow, the pups will molt their dark brown coats for light brown or silver coats. Juveniles are usually slender-bodied.
- The average lifespan of a sea lion is around 20 years, although some have been recorded to live longer.
- Age can be determined by counting growth layers on their teeth, similar to rings on a tree.

Box Turtle Life Cycle

- Unlike mammals, box turtles are cold-blooded reptiles.
- Box turtles mate from April to October, with nesting occurring from May through July.
- Typically, a box turtle has one clutch per year, laying between 2-8 eggs in each clutch.
- The box turtle will dig a nest several inches below the soil, burying the eggs.
- Incubation of the eggs lasts 3 months, roughly 70-80 days, but is dependent on the temperature of the soil.
- As with other turtle species, the temperature of the nest determines the sex of the hatchlings. Warmer nests produce females, and cooler nests produce males.
- Box turtles do have a low reproductive rate, but they are long lived. While it requires 10-20 years to reach maturity, they can sometimes live to over 100 years. However, their typical life span is closer to 30-40 years old.

Lesson Plan
K-2 CREATURE FEATURES

Lesson Structure:

1. Show students the two videos, highlighting baby sea lions and baby penguins at Georgia Aquarium. Discuss with students what differences and similarities they noticed between the two baby animals' early life stages. Highlight the amount of time it takes for an animal to go through the life cycle stages.
2. Highlight the vocabulary words and have students identify the correct order of an animal's life cycle from egg to adult, placing the images next to the timeline by the correct time.
3. Introduce the Life Cycle Card Game and review the rules
4. Students start with 5 cards from the deck.
5. To begin their turn, students draw a card, either from the deck or the discard pile. They then can either lay a card or discard a card. If they lay a card, they do not need to discard.
6. To lay a card, it must be in the correct order, beginning with the animal name card. There are multiple animal life cycle options, but students may only lay out one animal.
7. The first player to lay out a complete animal life cycle in the correct order wins.
8. If needed, reshuffle the discard pile if you run out of cards.

Lesson Plan
K-2 CREATURE FEATURES

Evaluate:

1. Students should be able to compare and contrast the penguin chick and sea lion pup early life stages after viewing the videos.
2. Ask students to highlight the differences not only from each other, but also from the baby and the parent animals as well.
3. Ensure that students have an understanding of the order and timing of the life cycle stages for each animal, and can identify the similarities.

Extend:

1. Alternative lesson options include using the cards to play a game of war, with the older life stage winning over the younger.
2. The cards can also be used to play a memory match game, matching the parent to the baby.
3. For older students, have them calculate the amount of elapsed time between life stages for different animals, and compare to see which ones are longer or shorter.
4. To learn more about Eastern box turtle nesting, view this video, that highlights the Southern Conservation Trust.

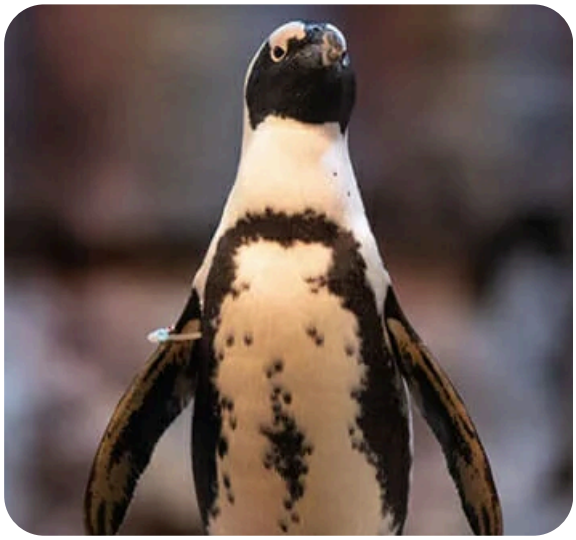
Lesson Plan
K-2 CREATURE FEATURES

Print 3 copies of each page and cut out the cards.

SOUTH AFRICAN
PENGUIN EGG

SOUTH AFRICAN
PENGUIN CHICK

SOUTH AFRICAN
PENGUIN FLEDGLING



SOUTH AFRICAN
PENGUIN ADULT

Lesson Plan
K-2 CREATURE FEATURES

Print 3 copies of each page and cut out the cards.

EASTERN BOX
TURTLE EGG

EASTERN BOX
TURTLE HATCHLING

EASTERN BOX
TURTLE JUVENILE

EASTERN BOX
TURTLE ADULT

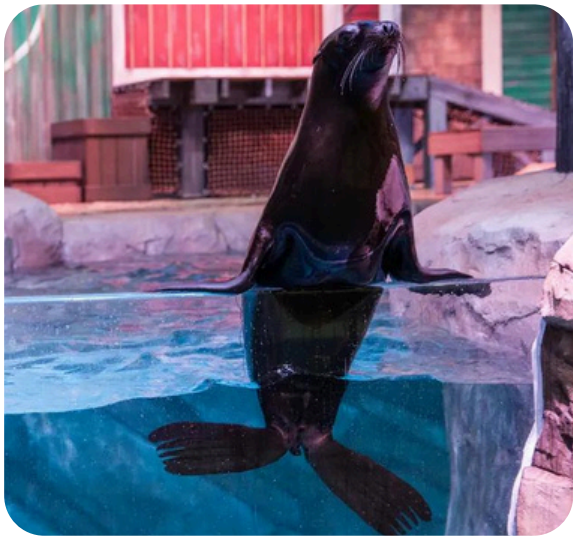
Lesson Plan
K-2 CREATURE FEATURES

Print 3 copies of each page and cut out the cards.

CALIFORNIA SEA LION BIRTH

CALIFORNIA SEA LION PUP

CALIFORNIA SEA LION JUVENILE



CALIFORNIA SEA LION ADULT

EDUCATION
GEORGIA AQUARIUM

Lesson Plan
K-2 CREATURE FEATURES

Print 3 copies of each page and cut out the cards.

BELUGA WHALE
PREGNANCY

BELUGA WHALE
CALF

BELUGA WHALE
YEARLING

BELUGA WHALE
ADULT

Lesson Plan
K-2 CREATURE FEATURES

Print and cut each timeline strip