Journey of a Sea Turtle

Use chance to model sea turtle survival from nest to adulthood.

Duration

Preparation: 20 minutes

Activity: 45 – 60 minutes

Supplies

- Dice templates
- Journey of a Sea Turtle cards
- Tape
- Scissors
- Data table

Background

Review the different life stages of a sea turtle with your students by reading the information below aloud. If time allows, view the TEDed "The survival of the sea turtle" by Scott Gass.

Stage 1: Hatchling (60 Days)
Female sea turtles lay their eggs on land during the night. The female will clear the sand away with her flippers and make a pit for the eggs or find another suitable place in the brush or open beach. The female turtle lays her eggs then covers them with sand. The female then crawls back to the ocean and the eggs will incubate in the nest.

Stage 2: Journey from nest to shoreline (1 hour)
Baby sea turtles emerge primarily at night. Hatchlings orient themselves to light reflected off the water, away from darker areas typically found inland. Over a hundred hatchlings may emerge from a nest at one time.

Stage 3: Surf Zone (2 hours)
Often referred to as a "frenzy," hatchlings remain in a swimming state, trying to get from the shoreline to deeper waters. Little is known about hatchlings from this point until they are adults and come onshore to nest again.

Stage 4: Pelagic Zone (1 year)
Juvenile sea turtles float in the open ocean currents, eating and growing. Little is known about this stage.

Stage 5: Benthic juvenile to adult (17 years)
Only 1% of a nest will reach maturity. At this stage, the only enemies of sea turtles are sharks and humans.

Instructions

1) Divide students into five groups. Give each group a copy of each set of dice template (5 per group). For each template, students must cut along the outside edges and tape together to create a die.

2) Each group also receives a set of Journey of a Sea Turtle cards, describing each life stage, and a data table. There are three available data tables.

3) Students begin with the "Eggs/Nest" die and roll to find their fate. If they are somehow killed, they mark on their data table with a tally mark the stage in which they died. If they survived, they move on to the "Hatchlings" die, and so on. Each group attempts 20 times, so that all five groups have a total of 100 data entries. The three data tables available reflect student abilities in fractions and percentages. In one, students only record the number of deaths, without calculations. In another, students record deaths, record this numerator in the fraction, and then determine the percent. In the last, students record deaths, create the fraction, and then determine the percent.

Follow-up:

1) Ask students which stage had the largest number of deaths. Ask them why they believe this is. As they answer, remind them of the duration of each stage and what each turtle must overcome in each stage.

2) Ask students what stage seemed to have the most deaths due to human behavior. Ask them to give examples of this.

Extension

Ask students to play the survivor game again, but anytime the die shows a death by some human activity, they treat it as a "free play" and roll again. Ask them to record these numbers. How do they compare to the first set? Why?

Have students create graphs representing the data table.

Journey of a Sea Turtle

Data Table

Stage when turtle died	1 – Eggs/Nest	2 – Hatchling	3 – Surf Zone	4 – Sargassum	5 – Open Ocean	Survived!
Group 1						
Group 2						
Group 3						
Group 4						
Group 5						

Journey of a Sea Turtle

Data Table

Stage when turtle died	1 – Eggs/Nest	2 – Hatchling	3 – Surf Zone	4 – Sargassum	5 – Open Ocean	Survived!
Group 1						
Fraction	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___
Percent	____ %	____ %	____ %	____ %	____ %	____ %
Group 2						
Fraction	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___
Percent	____ %	____ %	____ %	____ %	____ %	____ %
Group 3						
Fraction	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___
Percent	____ %	____ %	____ %	____ %	____ %	____ %
Group 4						
Fraction	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___
Percent	____ %	____ %	____ %	____ %	____ %	____ %
Group 5						
Fraction	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___	___ / ___
Percent	____ %	____ %	____ %	____ %	____ %	____ %

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Journey of a Sea Turtle

Data Table

Stage when turtle died	1 – Eggs/Nest	2 – Hatchling	3 – Surf Zone	4 – Sargassum	5 – Open Ocean	Survived!
Group 1						
Fraction	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20
Percent	____ %	____ %	____ %	____ %	____ %	____ %
Group 2						
Fraction	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20
Percent	____ %	____ %	____ %	____ %	____ %	____ %
Group 3						
Fraction	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20
Percent	____ %	____ %	____ %	____ %	____ %	____ %
Group 4						
Fraction	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20
Percent	____ %	____ %	____ %	____ %	____ %	____ %
Group 5						
Fraction	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20	___ / 20
Percent	____ %	____ %	____ %	____ %	____ %	____ %

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Eggs/Nest

(60 days)

Female sea turtles lay their eggs on land during the night. The female will clear the sand away with her flippers and make a pit for the eggs or find another suitable place in the brush or open beach. The female turtle lays her eggs and then covers them with sand. The female then crawls back to the ocean and the eggs will incubate in the nest.

Eaten by insects and mammals – Ants and other insects invade nests, mammals like raccoons and dogs dig up nests to eat eggs

Human activity – humans may collect eggs illegally or accidentally destroy nests

Survive

Survive – Eggs continue to incubate for the full 60 days before hatching

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Photo Credits

1. “Raccoon Cute Pose” by Harlequeen is licensed under CC BY 2.0
2. “Treads” by Xavier Dunigan is licensed under CC BY-NC-ND 2.0

Hatchling

(1 hour)

Baby sea turtles emerge primarily at night. Hatchlings orient themselves to light reflected off the water, away from darker areas typically found inland. Over a hundred hatchlings may emerge from a nest at one time.

Eaten/Wrong Direction – Hatchling may be attacked by crabs, birds, or mammals; artificial lights (street lights, hotel lights, etc.) may confuse the hatchling and lead the hatchlings away from the ocean

Survive

Survive – Hatchlings make the journey to the ocean water

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3. “Ghost crab” by Adam Foster Photography is licensed under CC BY-NC-ND 2.0

Surf Zone

(2 hours)

Often referred to as a “frenzy,” hatchlings remain in a swimming state, trying to get from the shoreline to deeper waters. Little is known about hatchlings from this point until they are adults and come onshore to nest again.

Eaten by fish and birds – Many large fish and birds eat the hatchlings swimming out to the sargassum (floating seaweed)

Survive

Survive – Hatchlings swim away from the shore and find protection in floating seaweed, called sargassum

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Sargassum

(1 year)

Juvenile sea turtles float in the open ocean currents, eating and gro wing. Little is known about this stage.

Eaten by large fish – Sharks, tuna, and other large fish are able to eat these juvenile turtles

Human activity – Dredging, oil pollution, and plastic consumption can all cause turtle deaths

Survive

Survive – Turtles remain protected by the sargassum before becoming too large and venturing out on their own

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Open Ocean

(about 17 years)

Less than 1% of a nest will reach maturity. At this stage, the only enemies of sea turtles are sharks and humans.

Disease – Fibropapilloma, a wide-spread disease, causes large tumors

Fishing gear – Turtles become trapped and drown when tangled with fishing gear, gill nets, and mesh nets

Eaten by large sharks – Bull sharks, tiger sharks, and other large sharks can kill turtles

Other human activity – Oil pollution, plastic consumption, boat strikes, chemical pollution and dredging

Survive

Survive – Can continue to swim in the open ocean, mate, and lay eggs

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Photo Credits

1. “Fibropapilloma-associated Turtle Herpesvirus” by PacificKlaus is licensed under CC BY-NC 2.0
2. “Brighton-4” by DavidShutter is licensed under CC BY-ND 2.0

Eggs/Nest

Eaten by insects and mammals

Human activity, like collecting eggs or destroying nests

Survive

Eggs continue to incubate

Survive

Eggs continue to incubate

Survive

Eggs continue to incubate

Survive

Eggs continue to incubate

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Hatchling

Eaten by predator or wrong direction

Survive

Hatchlings make the journey to the ocean water

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Surf Zone

Eaten by fish and birds

Survive

Hatchlings swim away from the shore to sargassum

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Hatchlings swim away from the shore to sargassum

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Eaten by large fish

Sargassum

Human activity, including dredging, oil pollution, and plastic consumption

Survive

Turtles remain protected by the sargassum before venturing out

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Turtles remain protected by the sargassum before venturing out

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Survive

Turtles remain protected by the sargassum before venturing out

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Disease, like fibropapilloma

4

Open Ocean

Tangled in fishing gear, gill nets, and mesh nets

Eaten by large sharks

5

Plastic consumption, boat strikes, dredging, oil pollution and chemical pollution

Survive

Turtles can continue to swim in the open ocean, mate, and lay eggs

Survive

Turtles can continue to swim in the open ocean, mate, and lay eggs

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