

“The more clearly we can focus our attention on the wonders and realities of the universe about us, the less taste we shall have for destruction.”

- Rachel Carson



RED TIDE
THE DINOFLAGELLATES ARE MULTIPLYING RAPIDLY



EXTINCT ANIMAL OF THE ISSUE
MORGANUCODON



NEW SECTION! ZOOLOGY EXPERIMENTS!
HOW TO FILTER WATER

NEWS FOR THE DEDICATED ZOOLOGIST

Red Tide

Blooms of algae caused by dinoflagellates have struck Florida’s coastline. The blooms have been particularly threatening for the past year and shows no sign of ending soon.

These blooms known as harmful algae blooms or HABs are causing issues such as respiratory issues and eye irritation in people, the disappearance of marine life, and contaminated shellfish. Red tide is limiting the number of beaches that beachgoers can visit, as well as further endangering marine life such as the Florida manatee and Kemp’s Ridley Sea Turtle, as well as the death of thousands of fish.



The most recent bloom of dinoflagellates stretches 100 miles along the coast of Florida as well as many more miles out into the ocean. This “algal nightmare”, as National Geographic author Maya Wei- Haas is calling it, is surprisingly not entirely caused by humans. While we do impact and



enhance the affect of red tide, it is a natural phenomena that is not yet entirely understood yet. This phenomena if so far not preventable and people must adapt to the conditions at the time of red tide. What triggers red tide is still unknown.

However, humans are not innocent in this situation. People expose the ocean to fertilizers from agricultural runoff and cause the algae to multiply rapidly. Concentration of the cells in 1 liter of water has increased by 1,400,000 times than usual amounts in highly concentrated areas. While the common amount of cells in 1 liter of water today is generally 10 million, specific locations contain approximately 140 million cells in 1 liter of water according to *National Geographic*.



Within the past few months, thousands of dead fish have been swept together by wind and ocean currents to form a giant massacre of lifeless catfish, pufferfish, eels, Goliath groupers, and trout. To add to the great killing, the beginning of 2018 was welcomed with 80 dead Florida manatees washing onto the beaches of Florida. At the beginning of August 2018, a 26 foot long



juvenile whale shark surprised scientists studying red tide when it washed up on the beaches of Sanibel Island, Florida.

Many bivalves such as oysters and clams become contaminated with the toxic algae when they feed. The toxins stay in

their system and become poisonous for humans to consume. Cooking the bivalves unfortunately do not eliminate the toxins.

Red Tide is also making it much harder for beachgoers to enjoy a day at the beach. Red tide is responsible for sudden asthma attacks in people with asthma and respiratory issues, as well as eye irritation. The hazardous fumes of red tide sting the windpipe (trachea) and lungs as the contaminated oxygen goes through the respiratory track. Please! Do your part to spread awareness of red tide.

Why Are National Parks Important?



What exactly is a national park? A national park is an area of land set aside by the government for public use. The United States has 58 national parks including Yellowstone, Grand Canyon, Red Wood, and Everglades National Park to name a few. All national parks have a central goal, for example, protecting endangered plant and animals species, to preserve historical sites, and so on. National Parks such as Hawai'i National Park work to protect their state bird, the nēnē goose and endemic birds. While Mesa Verde National Park's goal is to preserve the mesa- top villages of Ancestral Pueblo People.

Upcoming Events!

Mark these events on your calendar and spread awareness to celebrate them!

- February 2- Hedgehog Day
- February 5- Monarch Butterfly Day
- February 15- National Hippopotamus Day
- February 18- World Whale Day and World Pangolin Day
- February 22- National Wildlife Day
- February 27- International Polar Bear Day
- March 3- World Wildlife Day
- March 15- Buzzard Day
- March 16- National Panda Day
- March 20- World Frog Day and World Sparrow Day
- March 22- International Day of the Seal
- March 29- Manatee Appreciation Day

Cool Crafts that are Eco- Friendly Toilet Paper Roll Snakes

Materials:

- 1 toilet paper roll
- Scissors
- Acrylic paint of choice
- paint brush
- Marker
- googly eyes if available

Instructions:

- 1.) Paint your toilet paper roll any color
- 2.) Take your toilet paper roll cut into a spiral
- 3.) Make a V- shaped head for a venomous snake (optional)
- 4.) Give your snake a tongue
- 5.) Add googly eyes



There are over 3,000 species of snake all over the world!



The Scatology Corner!

Scatology is a field of science that involves the study of the contents of an animal's poop.

On the prairies of Central United States, we really need to watch where we step. Not just avoiding prairie rattlesnakes, but the also the scat of the mighty prairie bison. These piles of flattened brown poo would certainly not be fun to step on, the size of it would probably engulf your whole foot! These patties dry in the sun and are then collected by locals to be used as fertilizers.



Bison Poop



Your Questions, Answered!

Dana asks: "How many species of marsupial are there?"

Marsupials are animals that nurse their young in a pouch. There are 334 species of marsupial in the world. 60% of these species are from Australia. Some species include the iconic kangaroo, Virginia opossum, koala, and the Tasmanian devil. Marsupials can not be confused with placental mammals which nurse the young through the placenta (umbilical chord) during gestation. Marsupials also can not be confused with monotremes.

Got A Burning Wildlife Question? Ask Morgan Gaskell!

Stay tuned for the bimonthly scat!

National Park Spotlight

Olympic National Park, WA

Filled with acres of lush, mossy forests, thrilling hiking trails, inspiring mountain views, miles of coastline, and home to over 300 bird species, Olympic National Park is a very diverse place. Subalpine zones, temperate rainforests, lowland forest, and coast, Olympic National Park’s major ecosystems are a wonder to behold. Home to animals such as vital salmon, banana slugs, bears, deer and elk, coastal birds and many mollusks, Olympic National Park is rich in biodiversity.



Starting with the forest floor, Olympic National Park’s organic waste is managed by the all- mighty banana slug which decomposes decaying plant and animal matter. Rocks, trees, and hiking trails are covered in lush moss. Ferns dot the the area, as do pine trees, and various Pacific Northwestern fungi. Mushrooms include the hard, fan- like artist’s conk and jellied bird’s nest fungi which resemble pepper seeds in a bowl of liquid.



The forest of Olympic National Park is inhabited by beavers, black bears, black tail deer, cougar, fishers (similar to pine Martens), Olympic marmot, and Roosevelt elk. Some of these animals migrate with the turn of seasons, such as the deer and elk. Others stay in the snow and hibernate, such as snowshoe hare and the Olympic marmot. The beavers keep river flow steady and form lakes with their dams. Roosevelt elk and deer keep grass meadows cut.



On the coastline, bivalves such as Pacific oysters, butter clams, keyhole limpet, California mussel, and Nuttall’s cockle can be found attached to rocks. Black oyster catchers, seagulls, and bald eagles can be seen flying overhead spying for fish. Washington’s iconic sockeye salmon rush through Olympic National Park’s rivers. Every year they make their hundreds of mile long migration from the ocean upstream to spawn. The 10 major rivers and the Pacific Ocean provide shelter and food for 36 species of fish. Including the endemic miniature Olympic mud minnow, and Beardslee and Crescenti trout in Lake Crescent.

Lastly, Olympic National Park is home to more than 300 species of bird including the sooty grouse, band- tailed pigeon, common raven, California quails, Canada jays, brown pelican, great blue heron, western sandpiper, various hummingbird, and western tanager, to name a few. Walking into the dimly lit forests, you are guaranteed to hear the chirps, calls, and tweets of these diverse bird. Olympic National Park is protected mainly for its diverse species.



Bio inventions

Friendsheep Wool Dryer Balls



Made in the Himalayan Valley of Kathmandu, Nepal, Friendsheep Wool Dryer Balls are artisan made by Nepali women seeking sustainable jobs. These dryer balls are eco-friendly, being made with organic wool, and can be used thousands of times in place of dryer sheets. They are cruelty free, fair trade, plastic free, and zero waste. By tossing the balls in with your load of laundry, you can reduce drying time, which in turn, saves you time, energy, and money. When purchased, your bag of dryer balls comes in another bag made of handmade lokta paper, a reusable, 100% compostable material. Friendsheep Wool Dryer Balls come in many designs, sheep, stars, penguin, panda bears, and koalas. The fuzzy organic New Zealand wool is sure to please you and your load of laundry!

Zoology Experiments

The side of wonder

Every good scientist must know lots of facts about their topic. Wondering about the world around them is the other half. By conducting experiments, scientists learn new things that we may not have learned otherwise. For example, if Gregor Mendel did not conduct experiments of breeding pea plants, how could we have discovered the basics of modern genetics? Or, if Robert Hooke did not wonder what cork looked like under a microscope, how would we have discovered cells? As you can see, while one part of a subject is knowing the facts, wondering about the world and answering questions with experiments is just as important.

Question: How do you filter water?

Facts: Filtering water is crucial in ensuring that people have clean water to drink. Without filtering water, people can get really sick by drinking contaminated water. As the world expands on renewable energy sources, we may have to start filtering water of any pollutants and other toxins before using it to power a car.

Lab Safety!
Never consume the experiment! You may get clean water in the end, but **DO NOT** drink it!

Experiment: To The Lab!

Materials:

- 4 small cups (K- cups could work well for this) Ask an adult to help you cut off the bottom part
- Approximately 3 tablespoons of the following: gravel, sand, and active carbon
- 5 filter papers, 4 cut to size to the bottom of the cup
- 2 regular sized cups
- A funnel
- 1/2 a cup of water mixed with oil and dirt
- Tape and scissors

Instructions on next page!



Polluted sources of water cause many diseases. Every year, over 5 million people die as a result of dirty water, lack of proper sanitation, and bad water hygiene.



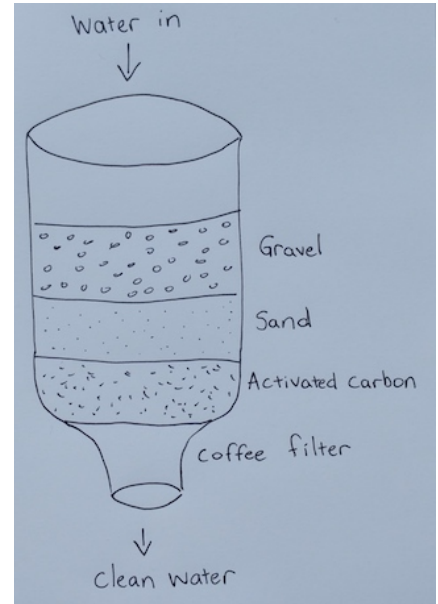
New water filtering technology has allowed millions of children and adults worldwide to have access to clean drinking water.

Instructions:

- 1.) Tape the filter papers cut to size to the bottom of the small cup.
- 2.) Put the gravel, sand, and active carbon into the small cups and stack on top of each other in that order from top to bottom.
- 3.) In the last small cup, fold the filter into a funnel shape and place inside.
- 4.) Tape together all 4 of the small cups and place inside funnel (make sure it does not fall over).
- 5.) Put funnel inside the regular sized cup and pour the artificial dirty water you previously made into the top of the filter. Wait a while for the water to go through.

Questions to Consider:

- 1.) How does the different substances you used effect the filter?
- 2.) Watch the flow of the dirty water through the filter, what do you notice?
- 3.) Is the water at the end cleaner or dirtier than when you put it in? Why?



Salmon Migration



living in salt water and fresh water, an adaptation not commonly found in fish. The reason for this adaptation is their great migration, otherwise known as the salmon run. During this time in the summer, salmon will travel thousands of miles from the ocean into a stream to get to a spawning ground, where they were born.

Salmon are amazing fish! You probably would not

believe that such fish would be able to do what they do. These amazing creatures travel hundreds of miles from the ocean upstream to the place were they were born to lay thousands of eggs.

Salmon are divided into six main species. These include the sockeye salmon, Chinook (king) salmon, coho salmon, Atlantic salmon, chum salmon, and pink salmon. All six of these species are capable of



There are many dangers the salmon must face, including sharks, birds, wolves, humans, and most famously, the grizzly bear. All these factors limit the salmon's chance of living greatly, but it is the way of life for the salmon. Human settlement in the form of dams prevent a lot of salmon from spawning. As a result, conservationists have invented

a salmon step ladder. The salmon jump from part to part. This step ladder is being implementing in many dams across America, but salmon face many other threats. These threats include over fishing and unsustainable fishing, habitat destruction, and climate change.



Salmon are anadromous, meaning they can live in both fresh and salt water.

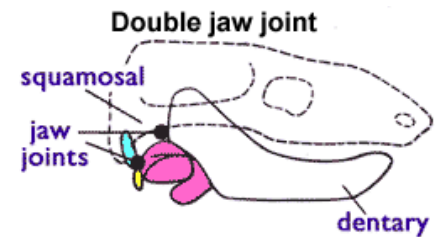
Prehistoric Animal of the Issue: Morganucodon

The small shrew sniffed the ground for insect pheromones. When he picked up the scent he moved towards it, creeping slowly. He grabbed the cicada in his mouth and swallowed it whole. The morganucodon looked up at the moon and then back down at the ground for another protein rich bug.



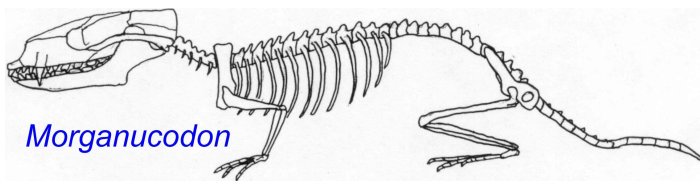
Morganucodon was a small mammal- like shrew of the Late Jurassic. It was a cross between a reptile and mammal. Morganucodon, and many others like it, gave rise to the mammal species of today. Fossils of morganucodon appeared 205 million year ago and tell us it was about 4 and a half inches long. Most of the fossils have been found in Glamorgan, Wales and Yunnan, China. Unlike many early mammals, morganucodon fossils preserved well.

Morganucodon is known as a *transitional mammal*. This means they had both jaw joints found in mammals and reptiles. Reptiles have an enlarged synapsid jaw joint while mammals only have dentary (mandible) jaw joints. Scientists classify morganucodon into the sub class Mammaliaformes. Morganucodon was a polyphyodont, meaning it could replace its teeth like reptiles did instead of mammals which are



diphyodonts (only having 2 sets of teeth in the entire life time.

Morganucodon was vital in the evolution of reptiles to mammals.



Morganucodon

Polyphyodonts Versus Diphyodonts

Polyphyodonts have an adaptation that allows them to have infinite teeth. Diphyodonts only get 2 sets of teeth. You are a diphyodont. That is why your parents always tell you to brush your teeth well, because once you loose your baby teeth, your adult teeth are the only ones you will get ever again. What other animals can you think of that are diphyodonts? Some other diphyodonts include horses, dogs, cats, primates, and more! Polyphyodonts have infinite supplies of teeth. What animals can you think of that are

polyphyodonts? Some include sharks, crocodiles, and alligators. The new teeth are generated from stem cells in the dental lamina of a polyphyodont. When the old tooth falls out, the new one pushes up.



Prehistory Poll

Which do you like better?

Prehistoric Reptiles

VS

Prehistoric Mammals

Games

Match the organization to the goal

- | | |
|---------------------------------------|---|
| 1.) Roots And Shoots | A.) Making Sustainable palm oil the norm |
| 2.) Rainforest Alliance | B.) Create a better future for people and nature |
| 3.) GreenPalm | C.) Gather team members worldwide in community projects |
| 4.) RSPO | D.) Explore and protect Earth |
| 5.) NOAA Ocean | E.) Provide science- based conservation and management to the world |
| 6.) World Wildlife Fund | F.) Protect North America’s Birds |
| 7.) Audubon | G.) Promote sustainable palm oil by working with other chains |
| 8.) National Geographic | H.) Conserve nature and reduce threats to the diversity of life |
| 9.) MSC | I.) End overfishing through sustainable fishing |
| 10.) News For The Dedicated Zoologist | J.) Educate the public about zoology and conservation |

See the last page for answers.


Nature Poll
Which will you conserve?

Water by saving on shower time and collecting water for plants

OR

Energy by using devices less and emitting less carbon dioxide

By using renewable energy sources such as water, wind, and solar energy, humans can cut down on carbon dioxide, and money, and be overall more efficient!



In The Last Issue...

The Mesozoic Era won 2-1!



Pterodaustro won 3-0!



Reptile Issue: Collared Lizard

The collared lizard (*Crotaphytus collaris*) is a common lizard found throughout Arizona, New Mexico, Utah, Nevada, and southern California. The collared lizards have adapted to run on their hind legs in order to catch prey such as insects and escape predators such as roadrunners. If a collared lizard loses its tail, which is unlikely, it does not grow back.



The collared lizard is named after the black and white “collar” around their neck. Their skin color ranges from yellow, blue, and green to brown, white, and red. The collared lizards live in sagebrush, desert scrub, pinyon- juniper, and desert grasslands. They enjoy living in rock crevices, and in the open vegetation of its habitat. When collared lizard females bear eggs, their stomachs develop bright red spots of color. When the eggs are laid, the spots fade away. 1 to 13 eggs are laid in the beginning months of summer and are not cared for by the parents.

Resources

- <https://oceanservice.noaa.gov/facts/redtide.html>
- <https://www.nationalgeographic.com/environment/2018/08/news-longest-red-tide-wildlife-deaths-marine-life-toxins/>
- <https://whatismyspiritanimal.com/animal-holidays-celebrations/>
- <https://www.nps.gov/olym/index.htm>
- <https://www.friendsheepwool.com/products/eco-dryer-balls-flock-of-friends>
- <https://pbskids.org/video/wild-kratts/3003015799>
- <https://www.newdinosaurs.com/morganucodon/>
- <https://kids.kiddle.co/Morganucodon>
- <https://www.desertmuseum.org/kids/oz/long-fact-sheets/Collared%20Lizard.php>

Thank You for reading this month’s edition of “News for the Dedicated Zoologist”! I hope you enjoyed it. Please do your part and spread awareness for all those endangered animals out there.



But wait, keep reading!

If you would like to ask a **zoology related** question to be featured in “Your Questions, Answered”, what you need to do is simple!

Fill out the information below and send it to my email or give it me in person.

“News For the Dedicated Zoologist” Request Paperwork

Name: _____

Age (optional): _____

Question: _____

Email (also optional): _____

Please send this paper to this address: biologysilife@50-50.com, ga1573mo1002@pusd.us, **or** give it to me in person.

Answers- Organization Match Game

- Roots And Shoots- C. Rainforest Alliance- B.
- GreenPalm-G. RSPO- A.
- NOAA Ocean- E. World Wildlife Fund- F.
- Audubon- F. National Geographic- D.
- MSC- I. News For The Dedicated Zoologist- J.

“News For The Dedicated Zoologist” is an uncredited non- profit newsletter, 100% of the money goes towards animal conservation.

Get Ready For The April- May Issue Of *News For The Dedicated Zoologist!*