

BELLE ISLE CONSERVANCY



Date _____

Researchers Name _____

Scientific Search

Welcome to the Belle Isle Aquarium!
Today, you'll take on the role of a researcher as you observe a variety of species from across the globe. The experience unfolds in the nation's oldest aquarium, on a vibrant island right at the heart of the city of Detroit.

Objective

Your objective is to investigate species from diverse aquatic habitats. Each tank serves as a window into many fascinating ecosystems. From the Great Lakes of Michigan to other waterways from all over the world.

You will decipher riddles that will guide you to specific exhibits, where you will observe and analyze the unique attributes of their featured species. By reading the questions and answers tied to these biological concepts, you'll gather critical data to decode the final puzzle, increasing your understanding of these remarkable creatures and possibly gaining a deeper appreciation for them along the way.

As you explore the exhibits, remember to be thoughtful and curious. The world is full of wonders waiting to be discovered. Good luck, May your explorations lead to new knowledge and exciting discoveries!

Scientific Method

The scientific method is a systematic approach used by scientists to study the world and solve problems, ensuring research is evidence-based. Here are the main steps:

Observation: Noticing things that spark curiosity.

Question: Formulating a specific question about the observation.

Research: Gathering existing information related to the question.

Hypothesis: Making a testable idea or prediction based on observations.

Analysis: Evaluating data to determine if it supports or disproves the hypothesis.

Communication: Sharing results with others through reports or presentations.

Utilizing this method will assist you as you complete this activity here at the Belle Isle Aquarium. And it can also be useful in future careers or simply in your everyday life to cultivate curiosity, explore questions, solve problems and make informed decisions.

Hypothesis

Clues and Exhibits

Clue 1: Euryhaline Queen

*I can live in both fresh and salty streams,
My wide swimming range fulfills my dreams.
Through local waters, I glide and leap,
A rather colourful secret, I can keep.*

Hint : My 

Question: What does it mean to be **Euryhaline**? (“*Yur-Eee-Hay-Line*”)

Answer: Euryhaline species can adapt to varying levels of salinity...

This means that they can survive in both fresh and saltwater environments, allowing them to migrate between streams and oceans during their lifecycle.

Quiz: what euryhaline species is the clue referring to?

Clue 2: Sessile Serenity

*Stuck in place, yet alive and bright,
A builder of habitats, swaying in the light.
Sessile I am, movement ever so slight,
Many species thrive near me, from predators' bite.*

Question: What does it mean to be **Sessile**? (“*Seh-sile*”)

Answer: Sessile organisms are permanently attached to a substrate, unable to move freely.

They provide essential habitats and resources for a wide range of marine life, significantly contributing to the structure and health of aquatic ecosystems.

Quiz: what sessile species is the clue referring to?

Clue 3: Viviparous Virtuoso

*Not born from eggs, despite what it seems,
I give live birth within watery streams.
A parent so small with fins quite thin,
I swim with a flutter, quick as the wind.*

Question: What does it mean to be **Viviparous**? (“*Vai-vi-pr-uhs*”)

Answer: Viviparous reproduction involves embryos developing within the body of an organism, and parents give live birth to fully formed young. In contrast, oviparous species... lay eggs.

Quiz: what viviparous species is the clue referring to?

Clues and Exhibits

Clue 4: Sensory Savant

I help hunt where light is faint,
My touch it guides without complaint.
Through murky depths, I find my way,
And help my animal seize its prey.

Question: What does it mean to have an **Adaptation?** (*"Ad-ap-tay-shun"*)

Answer: Adaptations are specialized traits or behaviors that help an organism survive in its environment. For instance, many aquatic animals often have enhanced sensory adaptations, such as highly sensitive organs, improved eyesight, or tastebuds all over their skin, enabling them to detect food and navigate in dark environments.

Quiz: What is the name of this unique creature feature?

Clue 5: Dazzling Decapod

With ten legs to strut, I dance with glee,
My vibrant hues make me hard to see.
In coral and caves, I find retreat,
A tiny crustacean, that's pretty neat!

Question: What does it mean to be a **Decapod?** (*"Dek-uh-pahd"*)

Answer: Decapods are a diverse group of crustaceans with ten limbs, and five pairs of appendages, including a pair of pincers (chelae). These limbs serve a variety of functions, such as locomotion, feeding, swimming, and defense.

Quiz: What decapod is the clue referring to?

Clue 6: Electric Enigmas

We generate power, a shocking feat,
A predator's touch that helps us eat.
In streams and rivers, we call our home,
Creating electricity everywhere we roam.

Question: What does it mean to be **Bioelectric?** (*"Bai-oh-ih-lek-trik"*)

Answer: Electric eels use specialized cells called electrocytes to produce electric charges for navigation, hunting, and defense. These cells store energy and release it as an electric current.

Quiz: how many species here have bioelectricity?

Clues and Exhibits

Clue 7: Regenerating Wonders

A fish with ancient ties to its kind,
Can regrow lost fins and swim just fine.
A regenerative marvel, beyond compare.
I can crawl on land and breathe in fresh air.

Question: What does it mean to have **Regeneration**? (*"Ree-jen-err-ray-shun"*)

Answer: Regeneration is the ability to regrow lost or damaged body parts. Some species possess remarkable regenerative capabilities, allowing special cells to repair their limbs and other such structures after injury.

Quiz: Which species with regeneration is the clue referring to?

Clue 8: Ancient Annihilator

My scales are hard, teeth like a spear,
I've swum through history, year after year.
With my slim body I hunt, my maw a snare,
A drifting silent stalker, my prey unaware.

Question: What are **Ganoid Scales**? (*"Gay-noid Skaylz"*)

Answer: Ganoid scales are thick, durable, resistant, diamond-shaped plates of collagen-coated with ganoine, a special kind of enamel that makes them tough, and protective, like armor. These scales are an evolutionary adaptation belonging to a handful of ancient fish species.

Quiz: Which species with Ganoid scales is the clue referring to?

Clue 9: Fragmental Frenzy

Across the sea floor, we reside,
Losing a piece is no cause for deride.
My fragments thrive and grow anew,
A body double, or perhaps a few?

Question: What is Fragmental Reproduction or **Fragmentation**? (*"Frag-men-tay-shun"*)

Answer: Fragmentation is a form of asexual reproduction where an organism's body can break into parts each capable of growing into an entirely new individual, to recover from injury and propagate.

Quiz: Which species with fragmental reproduction is the clue referring to?

Clues and Exhibits

Clue 10: Armored Anomaly

With plates on my back and a snout so long,
I rake the riverbeds, where I belong.
I'm a living relic, bony, armored skin you see
A ancient swimmer, oh yes, that's me!

Question: What is an **Exoskeleton**? ("*Ek-so-skel-uh-ton*")

Answer: Exoskeletons are external or semi/external skeletons providing armor and structure to the body, A variety of animals, from arthropods, reptiles, and even some fish have this adaptation.

Quiz: Which armored species is the clue referring to?

Clue 11: Toxic Territory

I carry toxins, a venomous might,
To ward off danger or win a fight.
With colors bold, I warn my foe,
A striking message: "Just so you know..."

Question: What does it mean to have Chemical Defenses? ("*Kem-i-kal Dee-fen-siz*")

Answer: Chemical defenses are adaptations that allow organisms to produce toxins or unpleasant chemicals, deterring predators and protecting themselves from harm.

Quiz: Which toxic species is the clue referring to?

Clue 12: Cooperative Creatives

*We build and thrive with tasks we share,
No single worker bears the care.
Our roles are split, yet unity is key,
The secret to success is you and me.*

Question: What does it mean to be Eusocial? ("*Yuu-So-Shull*")

Answer: Eusociality is the highest level of social organization found in animals, it is observed in a wide range of species groups across the animal kingdom. Eusocial species tend to achieve greater collectively than non-eusocial species, being more coordinated, abundant, and amassing a larger share of resources.

Quiz: Which eusocial species is this clue referring to?

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Scientific Search - Answer Key

Conclusion: The Endless Stream of Discovery

Science isn't just a collection of facts but a method, a way of seeing the world with curiosity and wonder. Every question asked, every clue solved, and every answer thought upon, is yet another step in the unending journey of discovery. Through observation, experimentation, and reflection, we refine our understanding of the natural world and our place within it.

The beauty of this process is that it thrives on uncertainty.

There is no final destination, no single "right" or "wrong" answer, but rather a continuum of insights that deepen with time.

What we think we know today might evolve tomorrow as we learn more and uncover new evidence. In this way, science mirrors life itself dynamic, adaptive, and ever-changing.

Below you will contrast the data you collected with your hypothesis to see if they were correct.

Clue 1: Euryhaline Queen

Question: What does it mean to be Euryhaline?
Quiz: What euryhaline species is the clue referring to?
Answer: Rainbow Trout (*Oncorhynchus mykiss*)
Exhibit: Rainbow Trout
Zoological Concept: Euryhaline species

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 2: Sessile Serenity

Question: What does it mean to be Sessile?
Quiz: What sessile species is the clue referring to?
Answer: Coral (Phylum Cnidaria)
Exhibit: Coral
Zoological Concept: Sessile organisms

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 3: Viviparous Virtuoso

Question: What does it mean to be Viviparous?
Quiz: What viviparous species is the clue referring to?
Answer: Butterfly Splitfin (*Ameioblennius splendiferus*)
Exhibit: Butterfly Splitfin
Zoological Concept: Viviparous reproduction

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 4: Sensory Savant

Question: What does it mean to have an Adaptation?
Quiz: What is the name of this unique creature feature?
Answer: Barbels (Sensory Organs)
Exhibit: Perruno Catfish (*Perrunichthys perruno*)
Zoological Concept: Nocturnal adaptations

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 5: Dazzling Decapod

Question: What does it mean to be a Decapod?
Quiz: What decapod is the clue referring to?
Answer: Sexy Shrimp (*Thor amboinensis*)
Exhibit: Sexy Shrimp
Zoological Concept: Crustacean anatomy and symbiosis

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 6: Electric Enigmas

Question: What does it mean to be Bioelectric?
Quiz: How many species here have bioelectricity?
Answer: Three
Exhibit: Electric Eel, Clown Featherback, Electric Catfish
Zoological Concept: Bioelectricity

My guess was
I found out that this was TRUE FALSE Because
Notes

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Scientific Search - Answer Key

Clue 7: Regenerating Wonders

Question: What does it mean to have Regeneration?
 Quiz: Which species with regeneration is the clue referring to?
 Answer: Bichir (Polypterus spp.)
 Exhibit: Bichir
 Zoological Concept: Regeneration

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 8: Ancient Annihilator

Question: What are Ganoid Scales?
 Quiz: Which Ganoid scales species is the clue referring to?
 Answer: Gar (Lepisosteus spp.)
 Exhibit: Gar
 Zoological Concept: Aquatic Morphology

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 9: Fragmental Frenzy

Question: What is Fragmental Reproduction or Fragmentation?
 Quiz: What fragmentally reproductive species is the clue about?
 Answer: Sea Stars (Class Asteroidea)
 Exhibit: Sea Stars
 Zoological Concept: Asexual (fragmental) reproduction

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 10: Armored Anomaly

Question: What is an Exoskeleton?
 Quiz: Which armored species is the clue referring to?
 Answer: Sturgeon (Acipenseridae)
 Exhibit: Sturgeon
 Zoological Concept: Exoskeletal physiology

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 11: Toxic Territory

Question: What does it mean to have Chemical Defenses?
 Quiz: Which toxic species is the clue referring to?
 Answer: Lionfish (Pterois spp.)
 Exhibit: Lionfish or Blue Hippo Tang,
 Zoological Concept: Chemical defenses

My guess was
I found out that this was TRUE FALSE Because
Notes

Clue 12: Cooperative Creatives

Question: What does it mean to be Eusocial?
 Quiz: Which eusocial species is the clue referring to?
 Answer: Humans (Homo sapiens)
 Exhibit: Humans
 Zoological Concept: Social behavior

My guess was
I found out that this was TRUE FALSE Because
Notes

Afterword:

Thank you so much for coming out and visiting the Belle Isle aquarium here in Detroit Michigan. The Methods of observation you used today teach us the power of perspective and offer us insight and an appreciation of a world filled with diversity, resilience, and interconnectedness. Each species, whether a dazzling decapod or an ancient annihilator, contributes to the intricate web of life. Their unique adaptations remind us that there are countless ways to thrive, survive, and inspire wonder.

When engaging with these concepts, you've participated in the essence of scientific learning: asking questions, exploring possibilities, and embracing the unknown. As you continue your journey of curiosity, remember that science doesn't demand perfect answers. Instead, it invites an open mind, a curious heart, and a willingness to learn from every experience.

So, whether you're studying aquatic life in an aquarium or exploring out in nature know this: the pursuit of knowledge is a reward in itself. Each discovery, no matter how small, illuminates a path forward, sparking new questions and possibilities. Because the joy of learning lies not in correct answers, but in the questions that keep us looking.

Keep learning. Keep exploring. Curiosity is the key to all the world's discoveries.

