

Name(s): \_\_\_\_\_ Group Name: \_\_\_\_\_ Date: \_\_\_\_\_

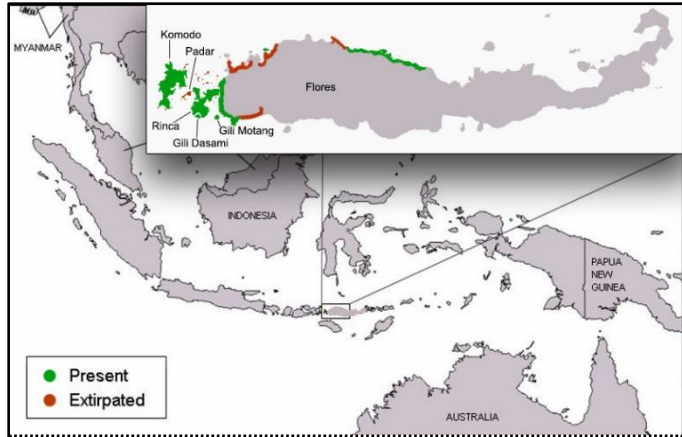
## Island Biodiversity & Ecology: Komodo Dragons

*Location: Komodo Courtyard*

### Land of the Dragons:

Komodo dragons (*Varanus komodoensis*) and the largest lizard species in the world. Their range, however, is quite small; they are only found on a handful of islands in Indonesia. The largest of these islands, Komodo, is about 22 miles long. The landscapes that can be found on the islands include tropical savanna forests, beaches, and mountainous ridges.

A study conducted in 2021 for the IUCN Red List found that the total population of Komodo dragons included 3,500 individuals. Based on their small range and population size, Komodo dragons are currently endangered. Other factors contribute to this status as well, including habitat loss, poaching, and rising sea levels.



**A map of the current range of Komodo dragons. This area is also referred to as Komodo National Park.** (Note: Extirpated means former or historic range.)

### Combating Island Isolation:



**Meet Iya the Komodo dragon! She lives at the St. Augustine Alligator Farm. This is a photo of her enjoying her Thanksgiving turkey in 2023.**

Animals that live on islands tend to have less access to resources because they have a smaller place to explore and find them. When faced with environmental changes and challenges, animals can *adapt* or make their own changes in response. Adaptations can occur over short-term and long-term periods and observed at the individual and species levels. For example, Komodo dragons are considered generalist carnivores because they will eat any prey item available to them.

While prey options might be plentiful, other needs like potential mates are not. With small population sizes and comparatively large

habitat ranges, finding a mate can provide challenging. To combat this, female Komodo dragons have developed an incredible adaptation – the ability to reproduce without need of a male. This process is called *parthenogenesis*. While this process is more common in smaller organisms, like insects, many shark and reptile species are able to undergo this process as well. This process usually results in offspring that are clones of the female. Things are a bit more complex for Komodo dragons, with the most interesting result being that all the offspring are males.

It used to be thought that female Komodo dragons could choose this outcome to make sure there would be mates present for the future. But scientists now know that it's not the female's choice, but rather her genetics that control this outcome.

*Genetics* is the study of how traits are passed from one generation to the next. The “instructions” for these traits reside within an organism's *genes*. Body plan, physical characteristics, and some behaviors of an organism are all controlled by genes. When the genes from male and female Komodos come together to form offspring, there is an equal 50/50 chance for the offspring to be male or female. But when only a female Komodo is involved in reproduction, roughly half of the eggs will be male, and the other half will not be viable. This all has to do with how copies of genes are made to be passed on and how they are able to combine during the early stages of reproduction for Komodo dragons.

While the process of parthenogenesis is quite complicated, it is a remarkable adaptation that allows Komodo dragons to still produce offspring in spite of their island isolation.



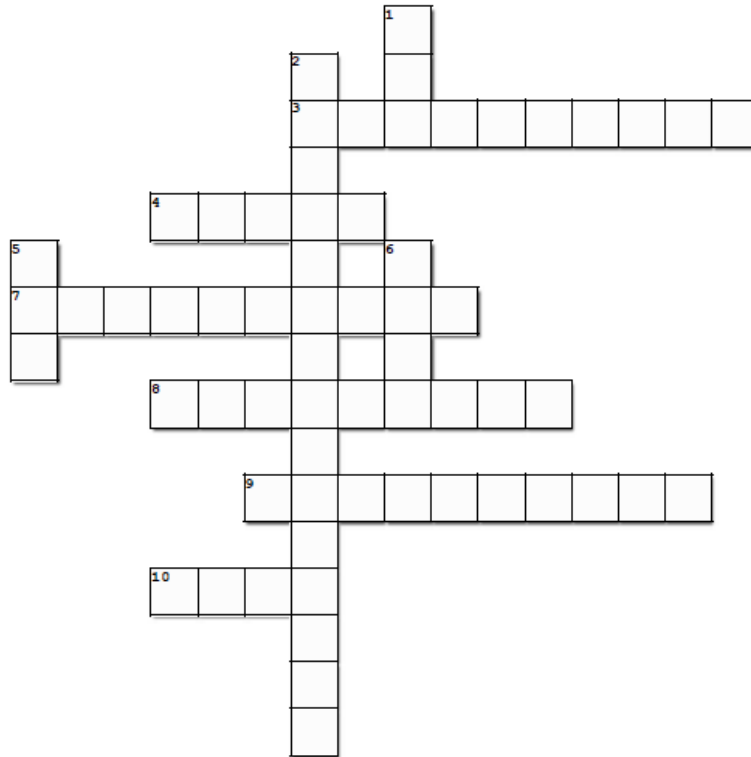
This is a baby Komodo dragon hatching out of an egg at the Bronx Zoo in 2021. Most reptiles hatch with the aid of an egg tooth – a tiny point on the front of their nose to help them cut through their egg shell.

Check out these resources to learn more about...

- ❖ **General Komodo dragon Facts** - [nationalzoo.si.edu/animals/komodo-dragon](http://nationalzoo.si.edu/animals/komodo-dragon)
- ❖ **Komodo dragon parthenogenesis** - [thetech.org/ask-a-geneticist/articles/2016/komodo-dragon-parthenogenesis-not-clone/](http://thetech.org/ask-a-geneticist/articles/2016/komodo-dragon-parthenogenesis-not-clone/)
- ❖ **Komodo dragon Conservation Status** - [iucnredlist.org/species/22884/123633058](http://iucnredlist.org/species/22884/123633058)
- ❖ **Komodo Dragon Conservation** - [globalconservation.org/species-facing-extinction/komodo-dragon/](http://globalconservation.org/species-facing-extinction/komodo-dragon/)
- ❖ **Komodo Survival Program** - [komododragon.org/](http://komododragon.org/)

## Activity: Komodo dragon Crossword Puzzle

- After reading the article and listening to the animal chat, see if you can solve the crossword puzzle below!



Created using the Crossword Maker on TheTeachersCorner.net

### **Across**

3. physical traits or behaviors an animal has to help it live in its environment.
4. Baby reptiles hatch out of their eggs by using their egg \_\_\_\_\_.
7. the current conservation status of Komodo dragons.
8. the only country where Komodo dragons can currently be found.
9. Komodo dragons are not picky eaters; this makes them \_\_\_\_\_ carnivores.
10. If a female Komodo dragon undergoes parthenogenesis, all of the offspring will be \_\_\_\_\_.

### **Down**

1. the name of the St. Augustine Alligator Farm's Komodo dragon.
2. the ability for a female organism to reproduce without the need of a male.
5. one threat to Komodo dragons is rising \_\_\_\_\_ levels which shrinks their available habitat.
6. the "instructions" for an organism's traits.

### **Discussion Questions:**

1. What are some physical adaptations that Komodo dragons have?
2. What are some behavioral adaptations that Komodo dragons have?
3. Which do you think is more useful: short-term or long-term adaptations? Why?
4. Do you think that the occurrence of parthenogenesis would change as the total population of Komodo dragons changes? Why or why not? How?
5. If you could have a unique adaptation from any animal, what would it be? Why?