



## Asexual Reproduction

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Asexual reproduction involves mitosis instead of meiosis. This means that all the offspring are clones of the parent.

Animals reproduce in two ways, sexually (two parents contribute genetic material) and asexually (only one individual contributes genetic material). Although asexual is less common in animals, it does occur.

There can be advantages to asexual reproduction as it allows for rapid production of offspring with little energetic cost which can be advantageous in a stable environment. However, having so little genetic variation makes it much more difficult for them to adapt to change.

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## Types of Asexual Reproduction

### Budding

This occurs when the nuclear material is evenly divided but the cytoplasm is unevenly divided producing a small bud. The bud can break off and develop into a individual organism or it can remain attached as part of a colony.

Examples of species that use budding include jellyfish, hydra and corals.

## Fragmentation

Parts of the parent's body break off and develop into complete individuals. This occurs in planarians, some worms and some sea stars.

## Parthenogenesis

This type of asexual reproduction involves unfertilized eggs developing into fully functional individuals. It occurs in many invertebrates and also some vertebrate species of fish, reptile, amphibians, and even some birds although bird eggs that come out of parthenogenesis do not hatch.

## Parthenogenesis in Vertebrates

Parthenogenesis is known to occur in several vertebrate species. It is the only type of asexual reproduction that happens in vertebrates and it never occurs in mammals.

Parthenogenesis in vertebrates is usually facultative [1]. This means that individuals within the species can reproduce both sexually and asexually depending on their environmental conditions at the time. This allows them to take advantage of good conditions even in the absence of males [2] while still maintaining genetic diversity by reproducing sexually.

There are some all female species that reproduce exclusively by parthenogenesis; virtually all of them are lizards [3].

## Evolution of Parthenogenesis

There are many questions as to why parthenogenesis evolved in some species.

In vertebrates, it has been theorized that it is a product of hybridization [4]. It would be advantageous in species that live in unstable environments where they can easily become separated from other members of the species. What is becoming clear is that it may be more common than previously believed.

There is no way to identify an individual reproduced by parthenogenesis without a DNA analysis of both the individual and the potential parents.

Many of the discoveries of parthenogenesis have come about in zoos where species are often separated by sex to allow males to be used for genetic diversity at various zoos around the world. When offspring are born in a same sex environment it does raise some questions.

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**Source URL:** <https://explorable.com/asexual-reproduction>

### Links

[1] <http://rsbl.royalsocietypublishing.org/content/early/2012/08/29/rsbl.2012.0666.abstract>

[2] <http://www.nature.com/nature/journal/v444/n7122/abs/4441021a.html>

[3] <http://www.pnas.org/content/77/1/499.full.pdf>

[4] <http://www.jstor.org/discover/10.2307/2459591?uid=2&uid=4&sid=21102357061657>