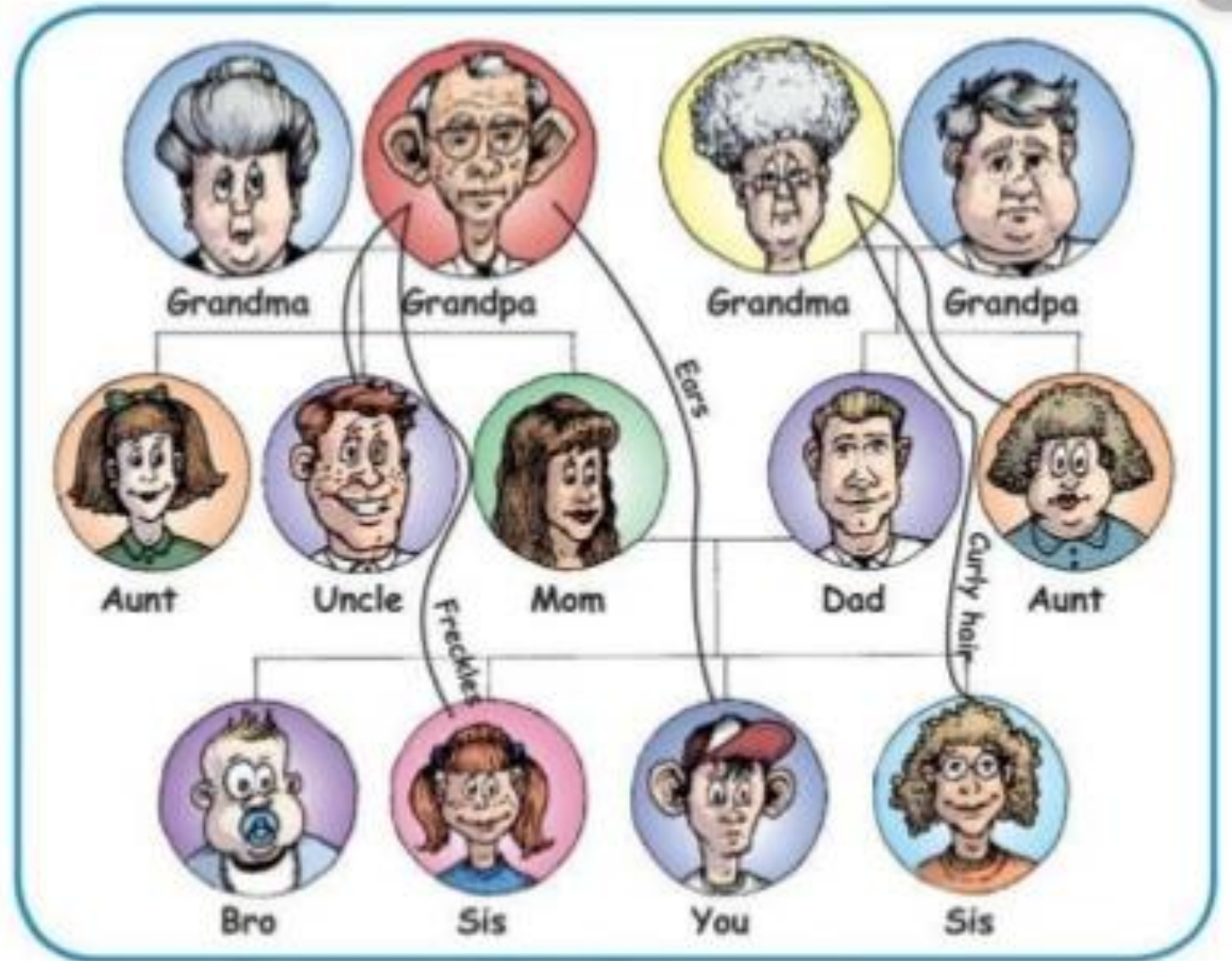


# Topic 3: Variation & Reproduction



# In this lesson you will

- describe examples of **variation** between organisms
- explain that your **traits** are decided by your **DNA**
- explain how variation helps organisms survive
- explain that traits are given to children by their parents through reproduction
- compare the advantages and disadvantages of sexual and asexual reproduction

# What is a **species**?

*any living thing*

- A **species** is a group of **organisms** that look alike and can **reproduce** with each other.
  - Examples: Humans, giraffes

*make babies*



*giraffes*



# There are many different **species** of cats



Different species cannot reproduce with each other

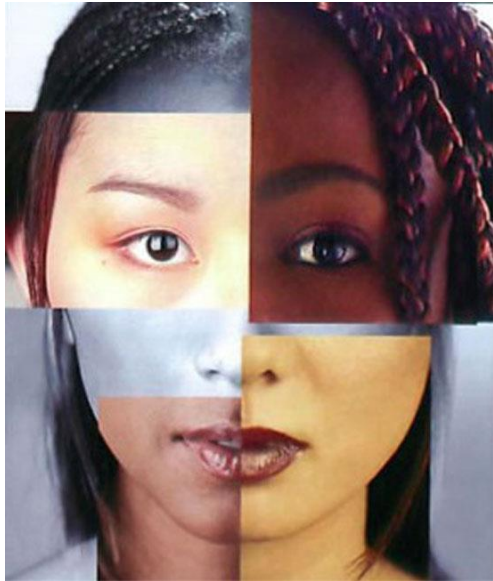
Domesticated dogs are all members of the same **species**



*These dogs could reproduce with each other.*

# Variation

- The differences between members of a species.
  - Examples:



Foxes







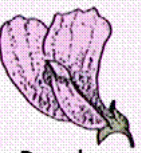
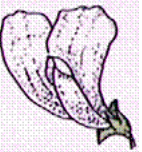
In humans, there are variations in skin color, eye color, hair color, eye shape, height, nose shape



# Trait





- Something about you that makes you different.
  - Examples: eye color trait

hair color trait  
skin color trait

Traits	Variations	
Seed shape	 Spherical	 Dented
Seed color	 Yellow	 Green
Flower color	 Purple	 White



# Variation in our Classroom

Species	Traits	Variations
Humans	<p>Trait 1: Singing</p> 	<p>good singer = 7                      bad singer = 2                      okay singer = 8</p>
	<p>Trait 2: Tongue-rolling</p> 	<p>yes = 8                      no = 10</p>
	<p>Trait 3: Thumbs-up</p> 	<p>hitchhiker's thumb = 9                      normal thumb = 7</p>
	<p>Trait 4: Earlobe shape</p> 	<p>attached = 3                      in between = 7                      free = 3</p>

Attached earlobe      Free earlobe  
 attached      free



# Variations in Kidney Beans

- What variations can you find in kidney beans?

(Draw the kidney beans)



Species	Traits	Variations within the trait
	Trait 1	
	Trait 2	

# Variations in Sunflowers



Species	Traits	Variations within the trait
	Trait 1	
	Trait 2	

# Variations in Southern Coquina Clams



Species	Traits	Variations within the trait
	Trait 1	
	Trait 2	



# Where does variation come from?

You have traits in common with your parents and siblings, but there are also variations among all of you.

These variations happen because **DNA** is mixed when species **reproduce**.



**Balto**



**Bruno**

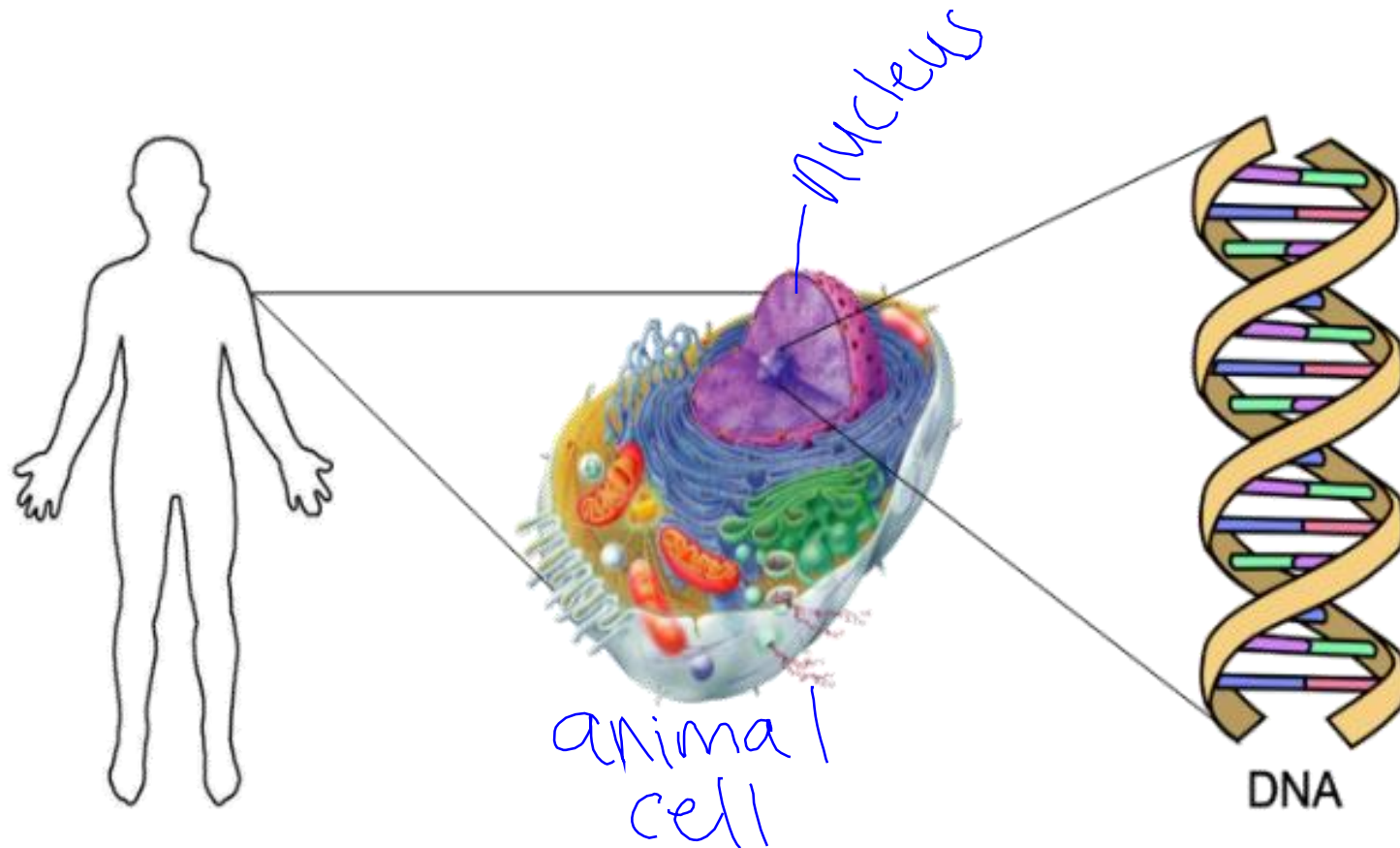
*something about you that makes you different*

*differences*

<b>Species</b>	<b>Traits</b>	<b>Variations within the trait</b>
<i>domesticated dogs.</i>	Trait 1 <i>Smell</i>	<i>good sense of smell</i> <i>bad sense of smell</i>
	Trait 2 <i>Size</i>	<i>Small, medium, large</i>

# DNA

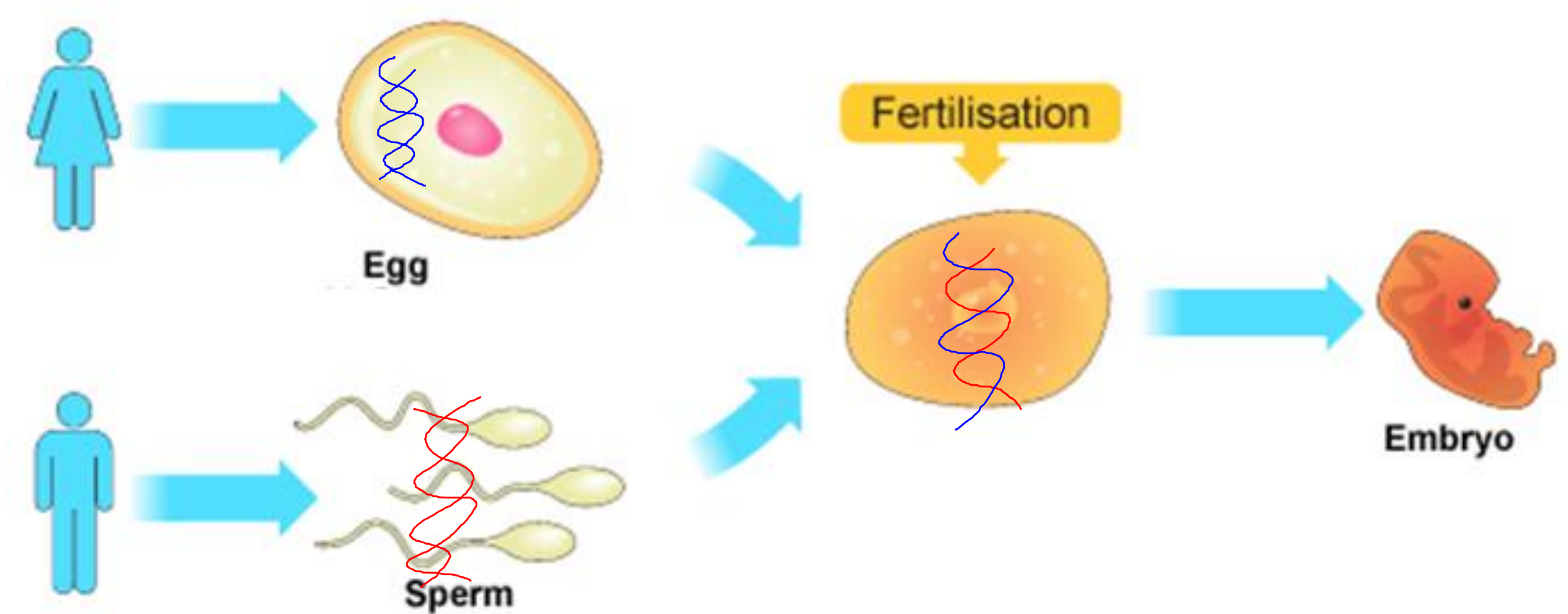
DNA is a material in the nucleus of your cells that **controls how you look**. You get  $\frac{1}{2}$  your DNA from **mom** and  $\frac{1}{2}$  from **dad**.





# Sexual Reproduction

DNA from **2 parents** is mixed to make a baby. The mixing of DNA makes variations in the baby.



# Sexual Reproduction

Examples of **species** that do sexual reproduction

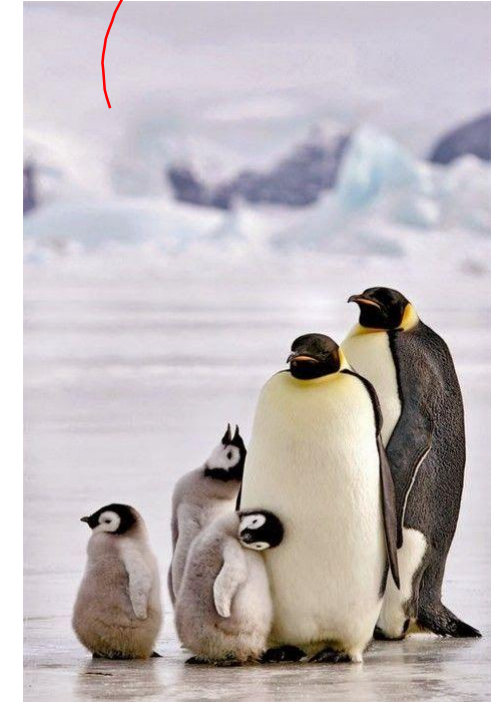
seagulls



lions



humans



penguins

Trying to attract a wife in the wild be like... <https://youtu.be/iTmHtxJpEWE>

# Why is **variation** important?

↳ differences



**Balto**



**Bruno**



If the only food source was on the other side of the fence, which dog would get the food?



# Variation helps organisms survive

keep living.

- Octopus camouflage
- Peppered Moth

Do you know the story of the **peppered moth**?

tree bark



Unpolluted Environment

tree bark

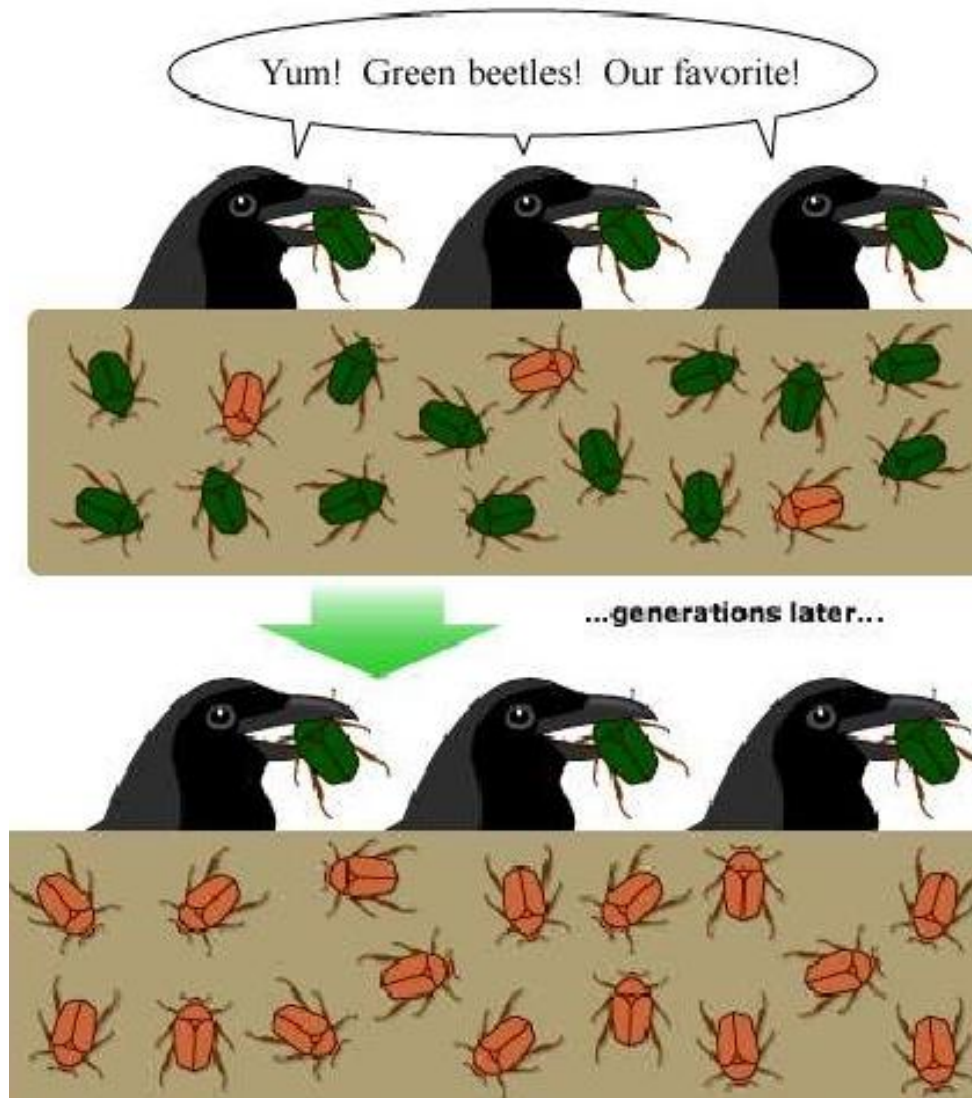


Polluted Environment

Variation is important within a species because it helps them survive as a species.

For example, light-colored moths may be more easily seen by **predators** than dark colored moths. The light-colored moths will be killed and eaten, but the dark colored moths will survive. If all the moths were light-colored then they may all have been eaten. The **species** can survive better if there is **variation** among its members.

# Variation helps organisms survive



# Sexual Reproduction



## Advantages of sexual reproduction

- Makes more species
- Makes variation within the species
- Species can survive better because of the variations (peppered moth)



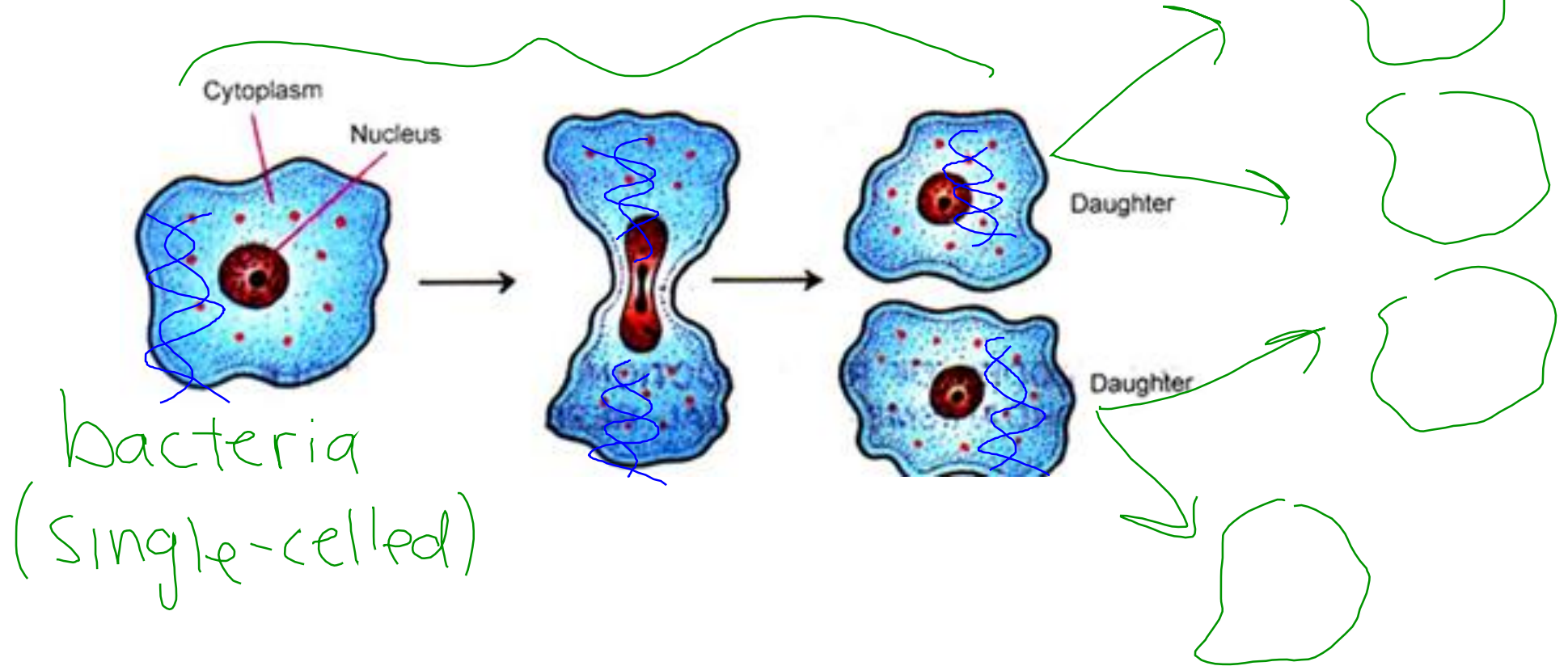
## Disadvantages of sexual reproduction

- Time and effort to find a partner, reproduce, and to raise the child.
- Risks to health and safety

hard work

# Asexual Reproduction

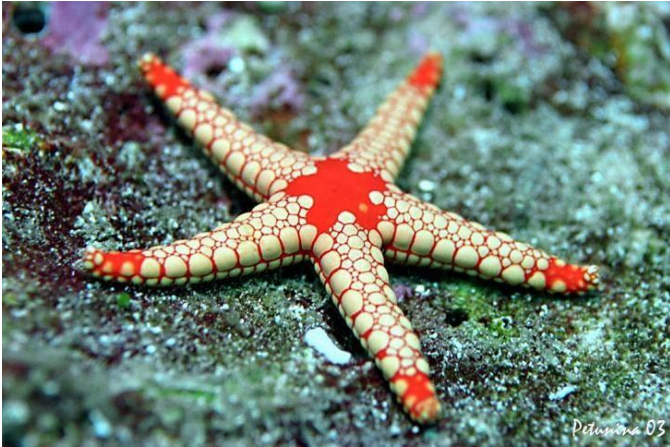
Only **1 parent** is needed to make a baby. The baby is **identical** to the parent because no DNA is mixed. *20 minutes*



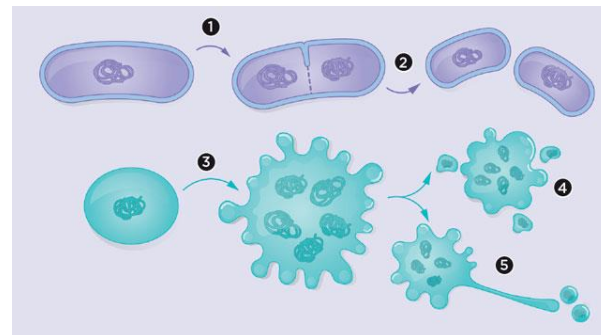


# Asexual Reproduction

Examples of animals that can do asexual reproduction



**Bacteria** are not animals, but they do asexual reproduction



# Asexual Reproduction



## Advantages of asexual reproduction

- makes a lot of babies very fast.
- No time or effort spent raising the child.
- Do not need to find a partner.



## Disadvantages of asexual reproduction

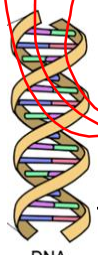
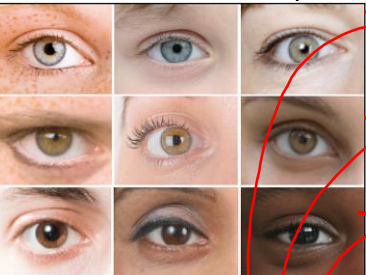
- There is no variation among the members of the species, so it is harder to survive when the species is attacked.

# Traits

**Heritable Traits:** Traits you get from your parents through DNA.

**Non-Heritable Traits:** Traits you must learn or are not born with.

Examples of <b>Heritable</b> Traits	Examples of <b>Non-Heritable</b> Traits
<p>eye color skin color sound of voice cheek shape DNA good looks</p>	<p>playing soccer tattoos good singer cut off finger be an artist</p>



DNA

