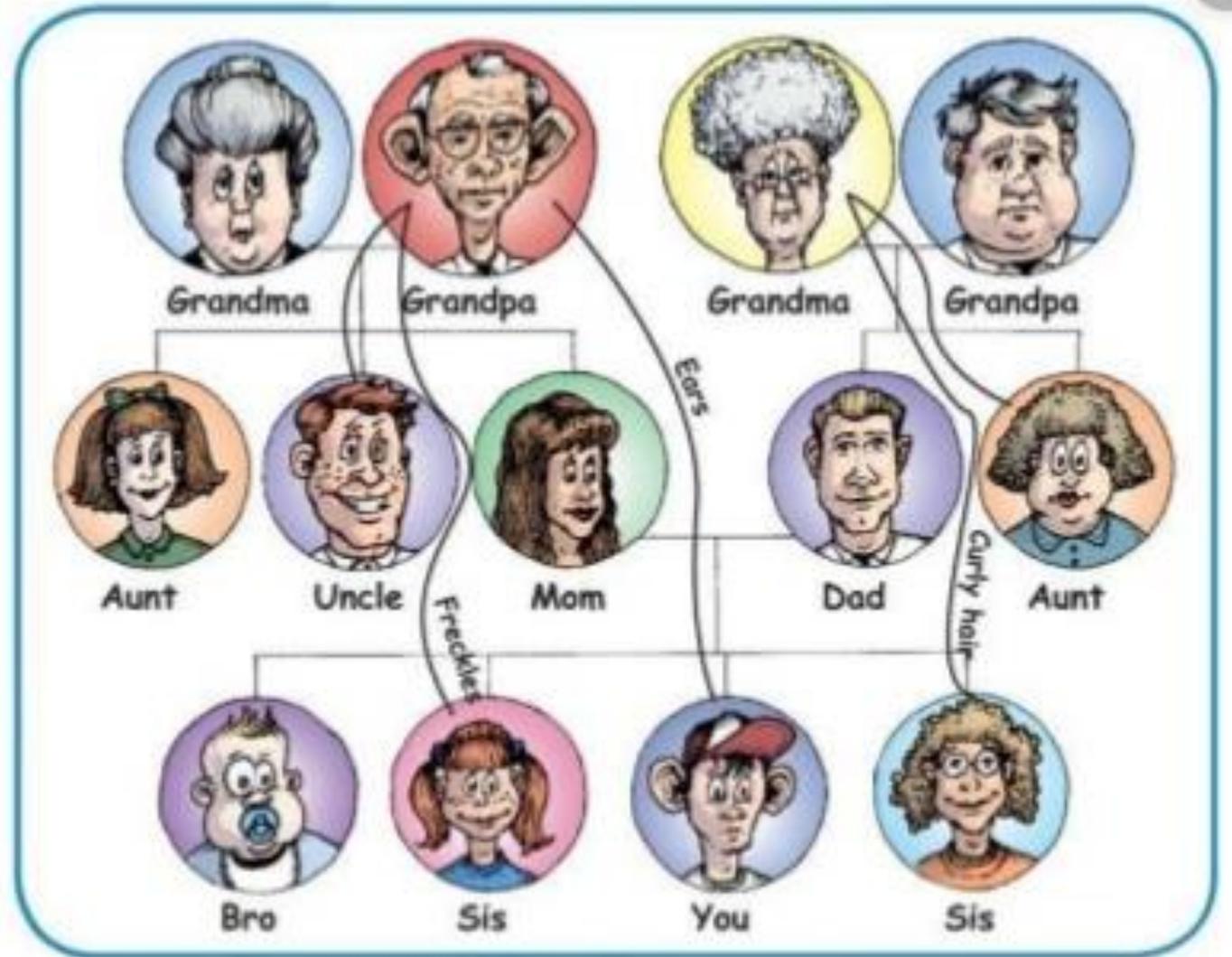


Topic 3: Variation & Reproduction



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

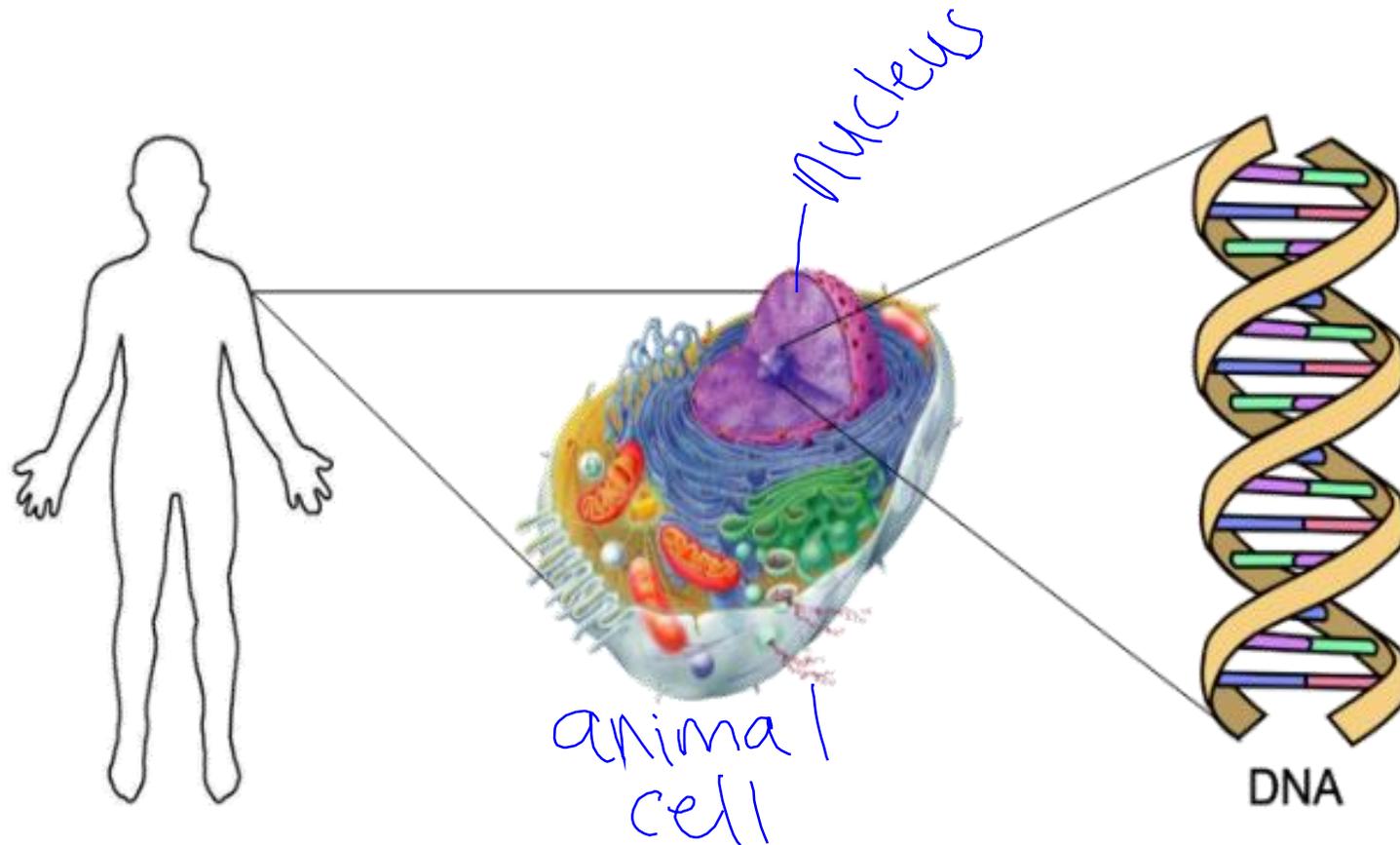
something about you that makes you different

differences

Species	Traits	Variations within the trait
<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>

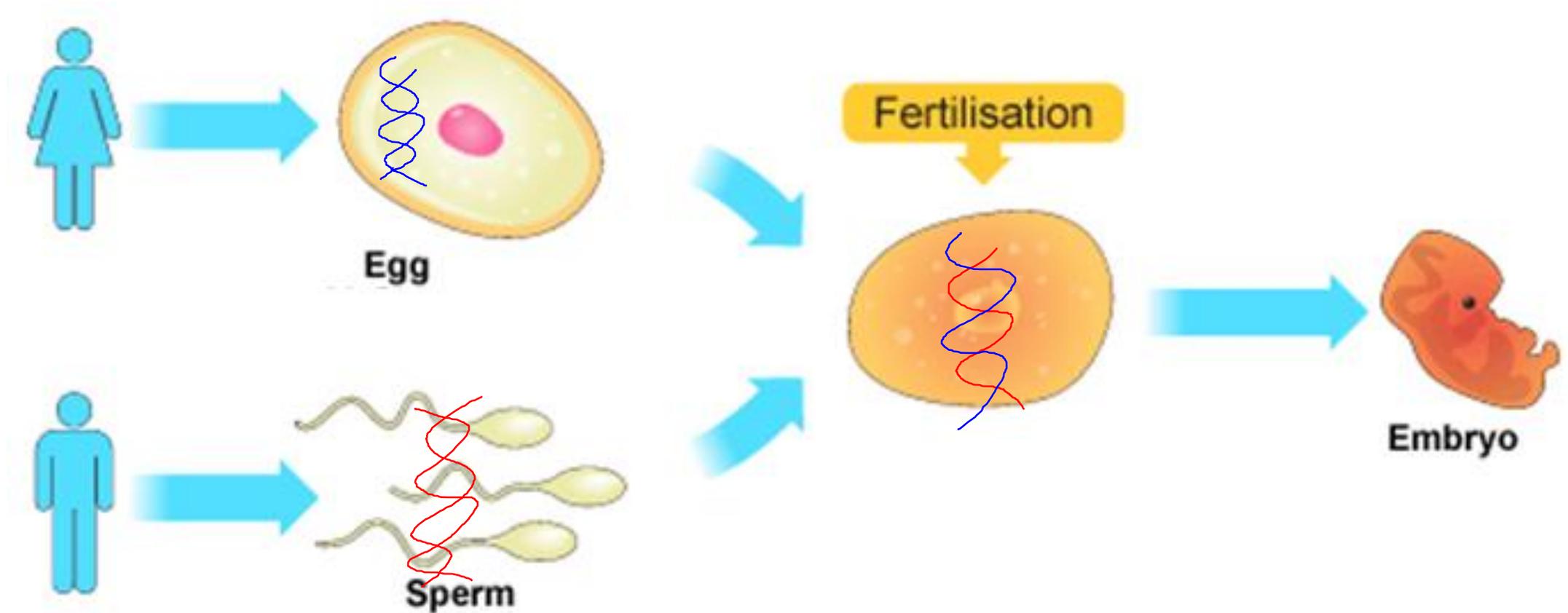
DNA

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

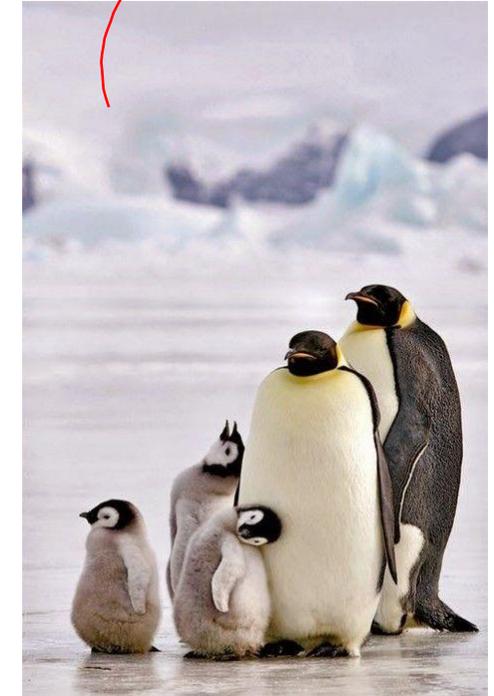
seagulls



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

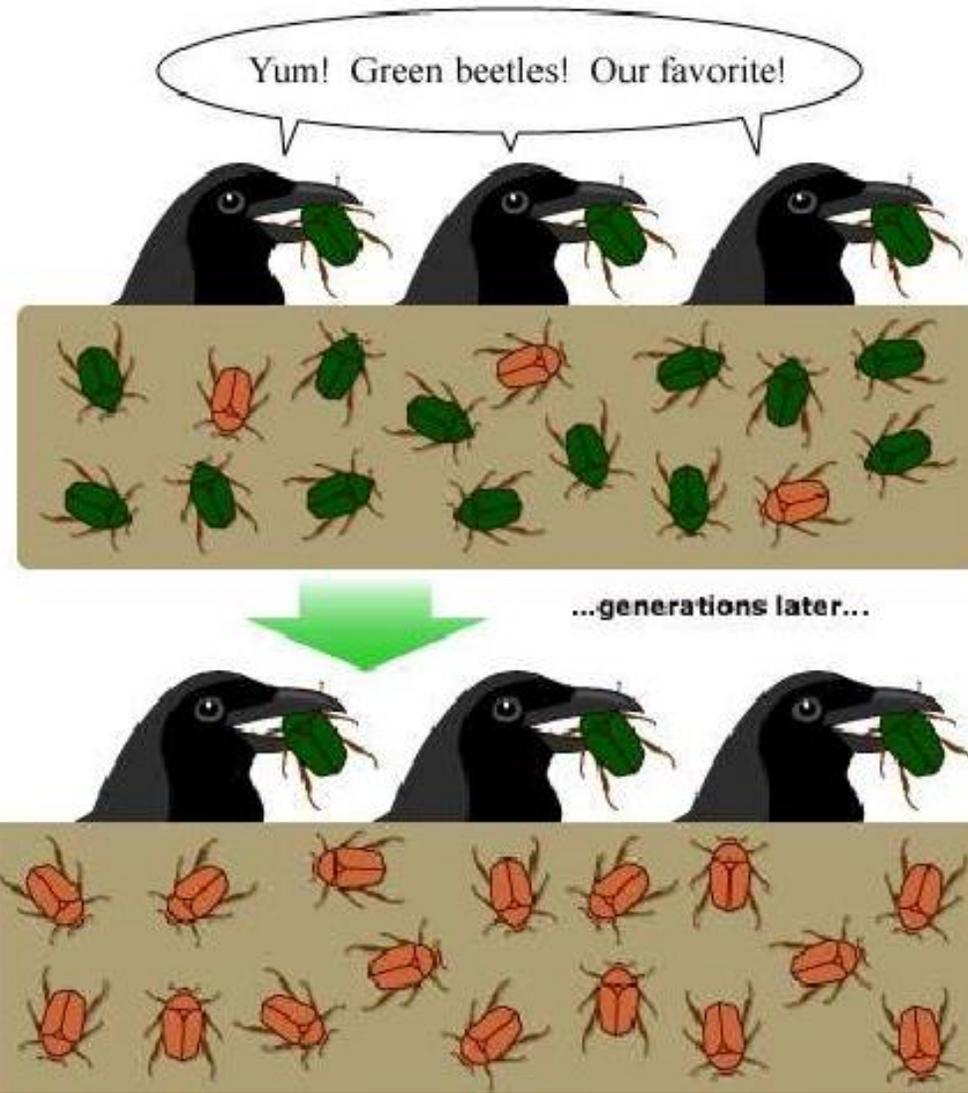


Polluted Environment

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

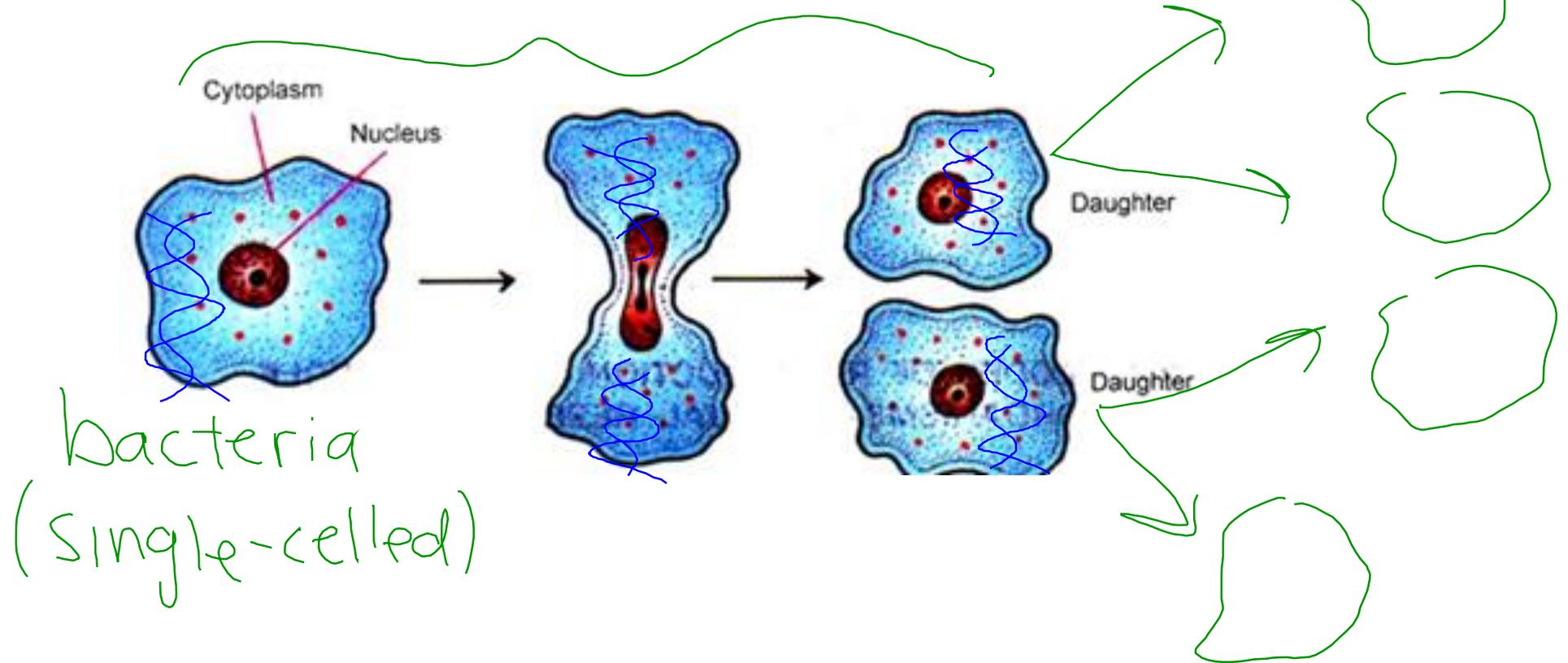
- Time and effort to find a partner, reproduce, and to raise the child.
- Risks to health and safety

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

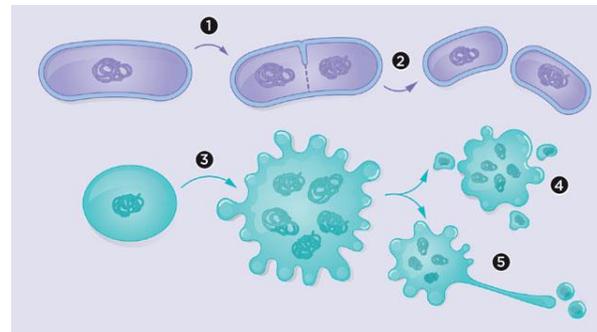


Asexual Reproduction

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.



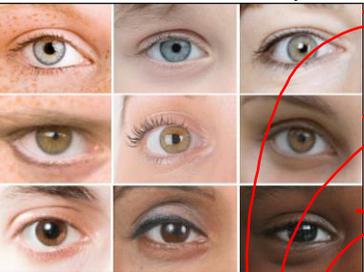
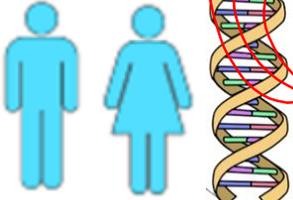
Disadvantages of asexual reproduction

- 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 Heritable Traits	Examples of Non-Heritable 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>

