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MoeBIOS vocabulary series



Biodegradable plastics



Biobased materials



Upcycling



Mechanical vs. chemical recycling



Microplastics



Compostable plastics

BIODEGRADABLE PLASTICS

📖 Definition: Plastics that can break down naturally into water, carbon dioxide, and biomass through the action of microorganisms. However, biodegradability depends on conditions like temperature, humidity, and microbial activity.

🌱 Example: PLA (polylactic acid), PHA, and PBS are commonly used biodegradable plastics.



BIOBASED MATERIALS



📖 Definition: Materials derived from renewable biological sources such as plants, algae, or agricultural waste, rather than fossil fuels.

🌱 Example: Biobased polymers like PEF (polyethylene furanoate) or PLA, made from corn starch or sugarcane.

UPCYCLING

📖 Definition: The creative transformation of waste materials into new, high-quality products, extending their lifespan and reducing environmental impact.


♻️ Example: Turning used plastic bottles into textile fibers for clothing instead of discarding them.

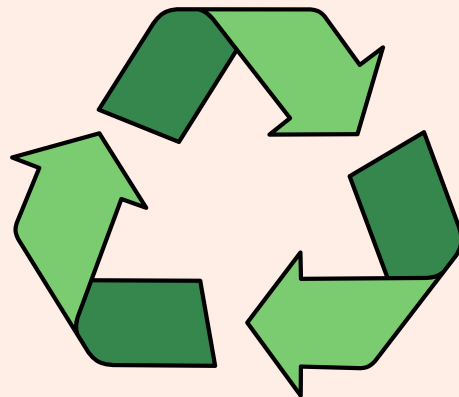


MECHANICAL VS. CHEMICAL RECYCLING

Definition:

- Mechanical recycling: Shredding, washing, and remelting plastics into new products without altering their chemical structure.
- Chemical recycling: Breaking down plastics into their basic chemical components to create new, high-quality materials.

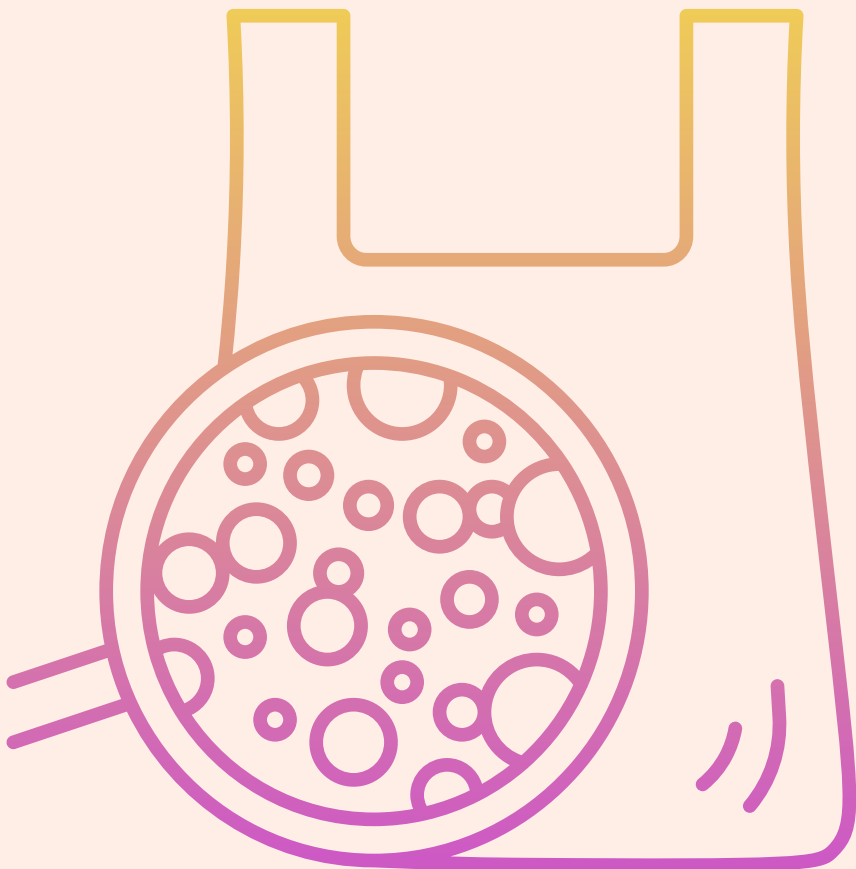
 Example: PET bottles can be mechanically recycled into new bottles, while chemical recycling can convert mixed plastics back into monomers.



MICROPLASTICS

📖 Definition: Tiny plastic particles (<5mm) that result from plastic degradation or are intentionally added to products like cosmetics. They pose environmental and health risks by accumulating in water, soil, and the food chain.

⚠️ Example: Microbeads in skincare products or fibers released from synthetic clothing during washing.



COMPOSTABLE PLASTICS

- 📖 Definition: A type of biodegradable plastic that breaks down into non-toxic components under specific composting conditions (temperature, humidity, microorganisms). Unlike general biodegradable plastics, compostable plastics must meet strict standards such as EN 13432 in the EU or ASTM D6400 in the U.S.
- 🌱 Example: Compostable food packaging, cutlery, and bags made from PLA or PHA that decompose in industrial composting facilities.



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