

Nā Meaola

Māiki:



@labhiofrank

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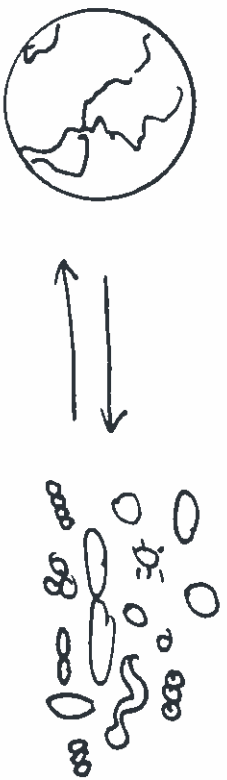
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MICRUBES FROM MOUNTAIN TO SEA

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The Frank Lab studies

the impact of environment on microbial dynamics and the impact of microbes on nutrient cycling for food production.



We ask...

1) WHO'S THERE?

Microbial community CENSUS
(ECOLOGY)

2) WHAT CAN THEY DO?

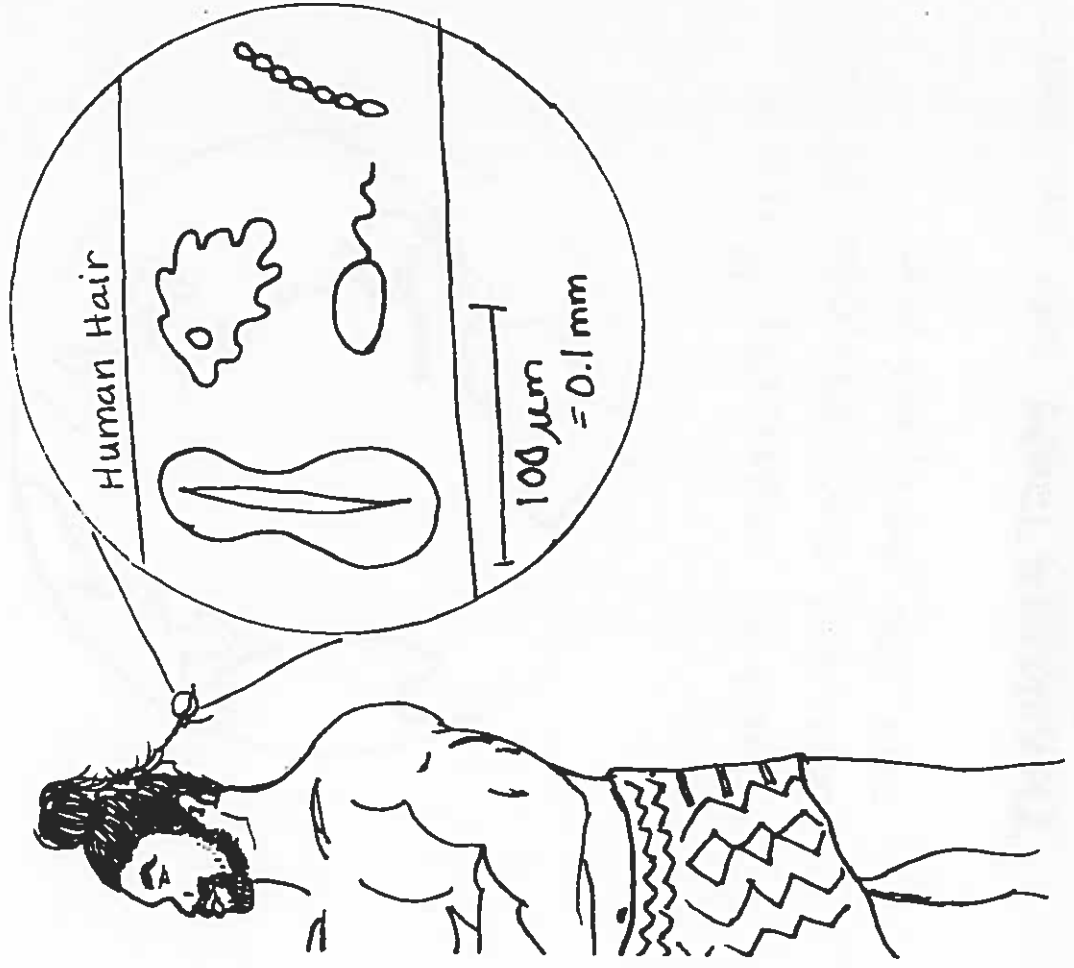
Microbial Job market
(FUNCTIONAL CAPACITY)

3) HOW FAST DO THEY DO IT?

Microbial performance review
(METABOLIC ACTIVITY)

#microbestomeal

Microbes are TINY
SINGLE CELLED organisms
that you can't see



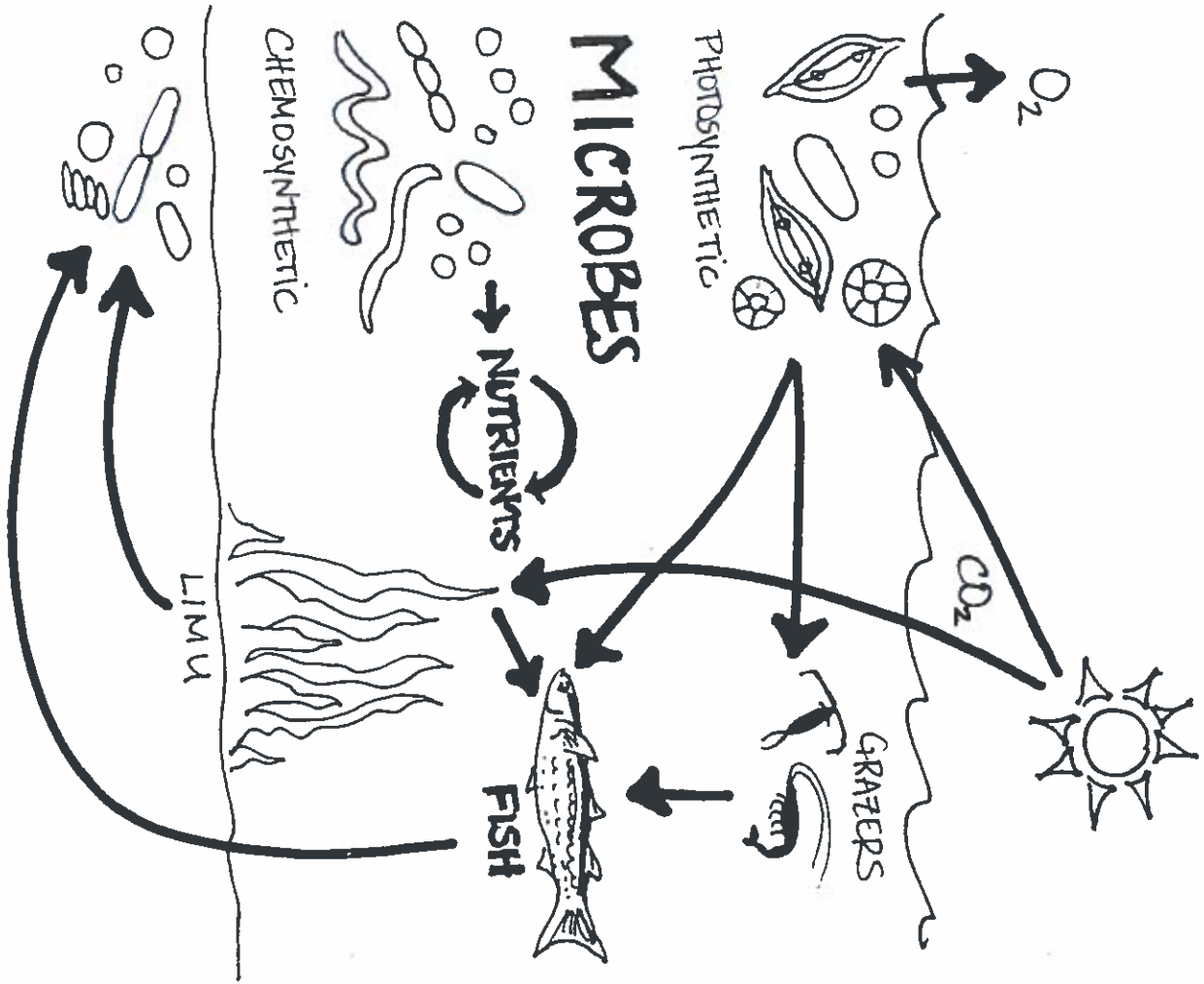
Microbes are found
EVERYWHERE!!



5×10^{30} microbes on Earth
= 5,000,000,000,000,000,
000,000,000,000,000

They are the **MOST ABUNDANT**
organism on the planet!!

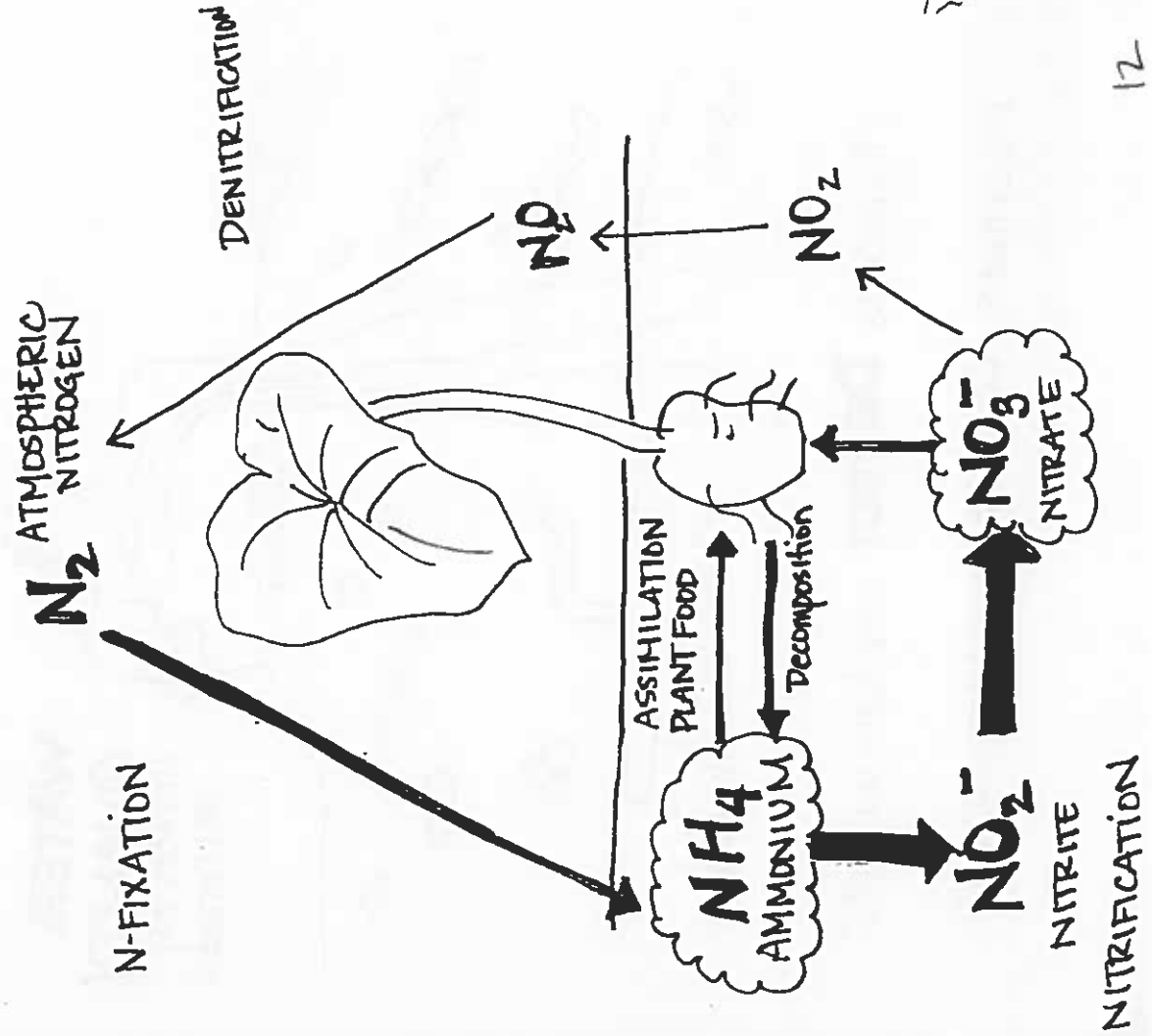
Microbes form the base of the
FOOD WEB in
TRADITIONAL AQUACULTURE



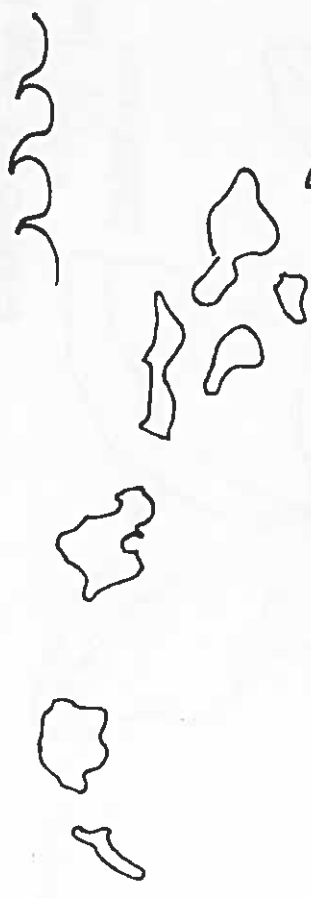
Microbes are important to

TRADITIONAL AGRICULTURE

because they **HELP PLANTS GROW** by converting **NUTRIENTS** into forms plants can eat



There are **MORE microbes** in the **OCEAN** than **STARS** in the known universe



Microbes make up **90% of the mass** of all LIFE in the ocean



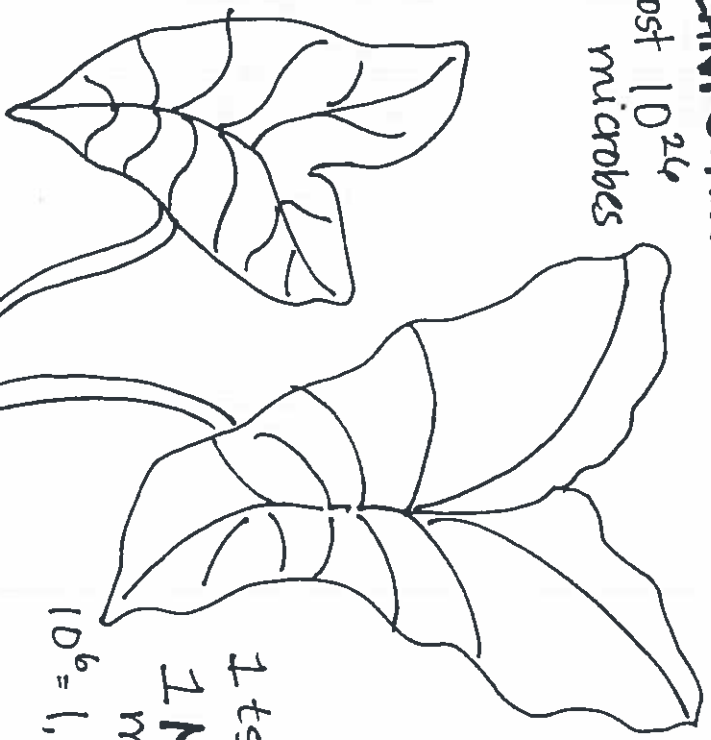
Microbes in the 'āina

Microbes are **IMPORTANT** in

GROUNDWATER AQUIFERS

PLANT SURFACES

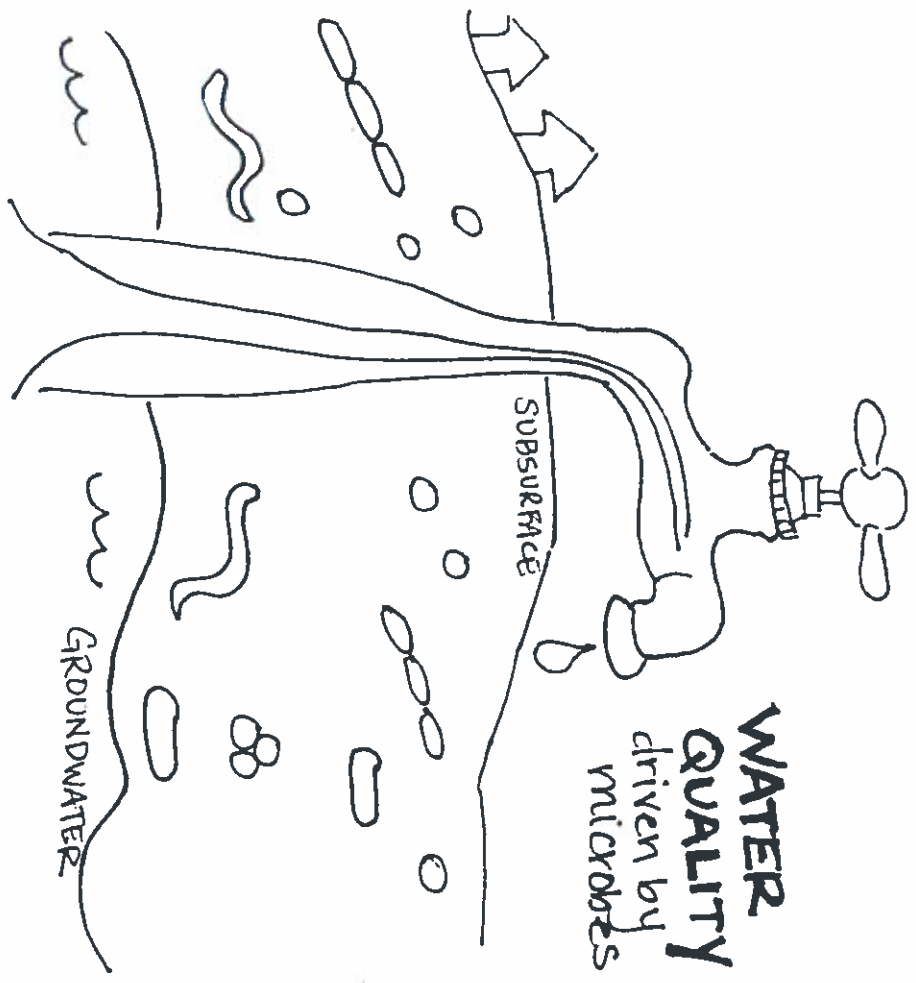
host 10^{24}
microbes



1 tsp **WAI**
1 **MILLION**
microbes
 $10^6 = 1,000,000$

1 tsp **LEPO**

1 **BILLION**
microbes
 $10^9 = 1,000,000,000$

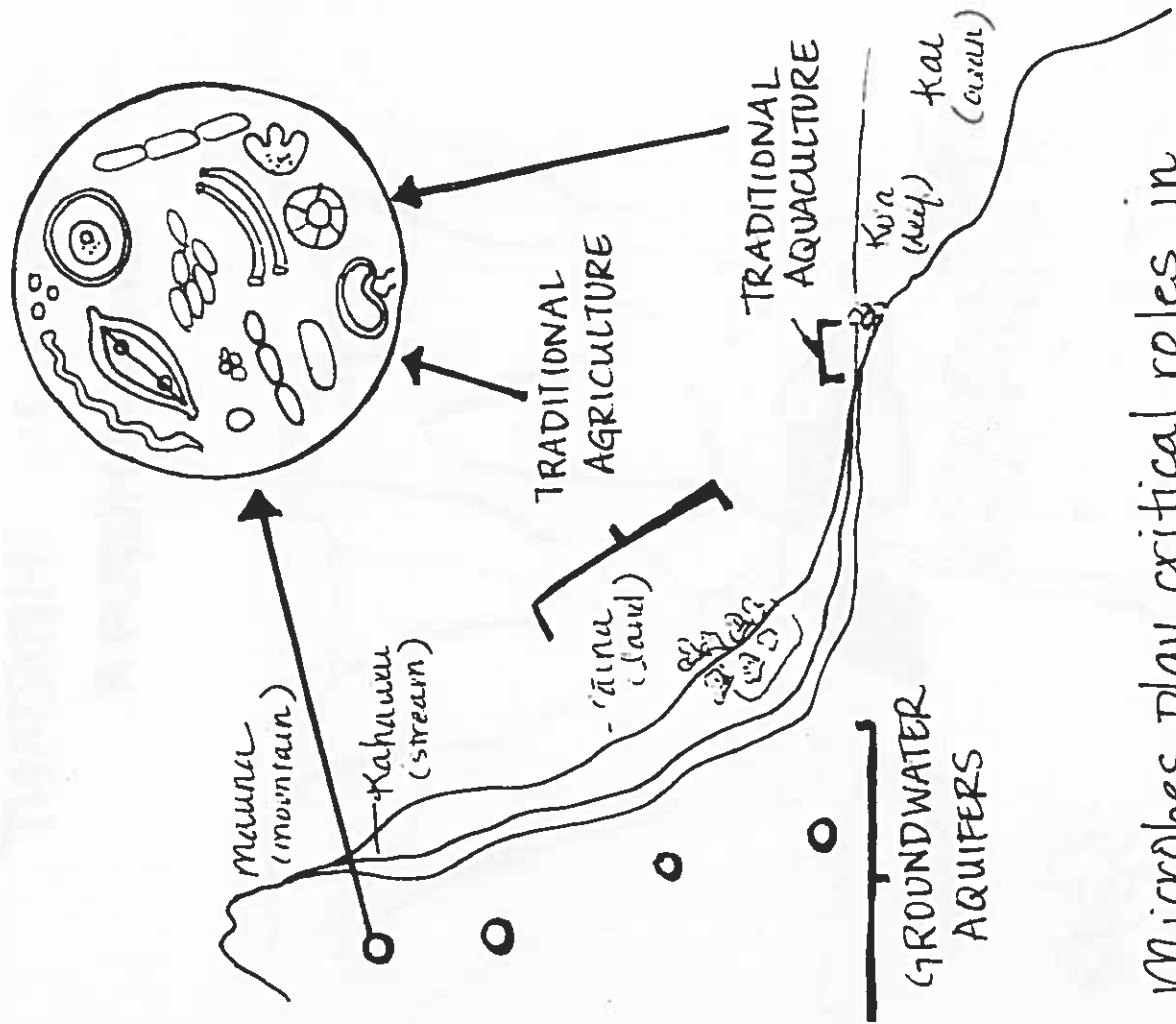


WATER QUALITY
driven by
microbes

Microbes **DETECT** contaminants

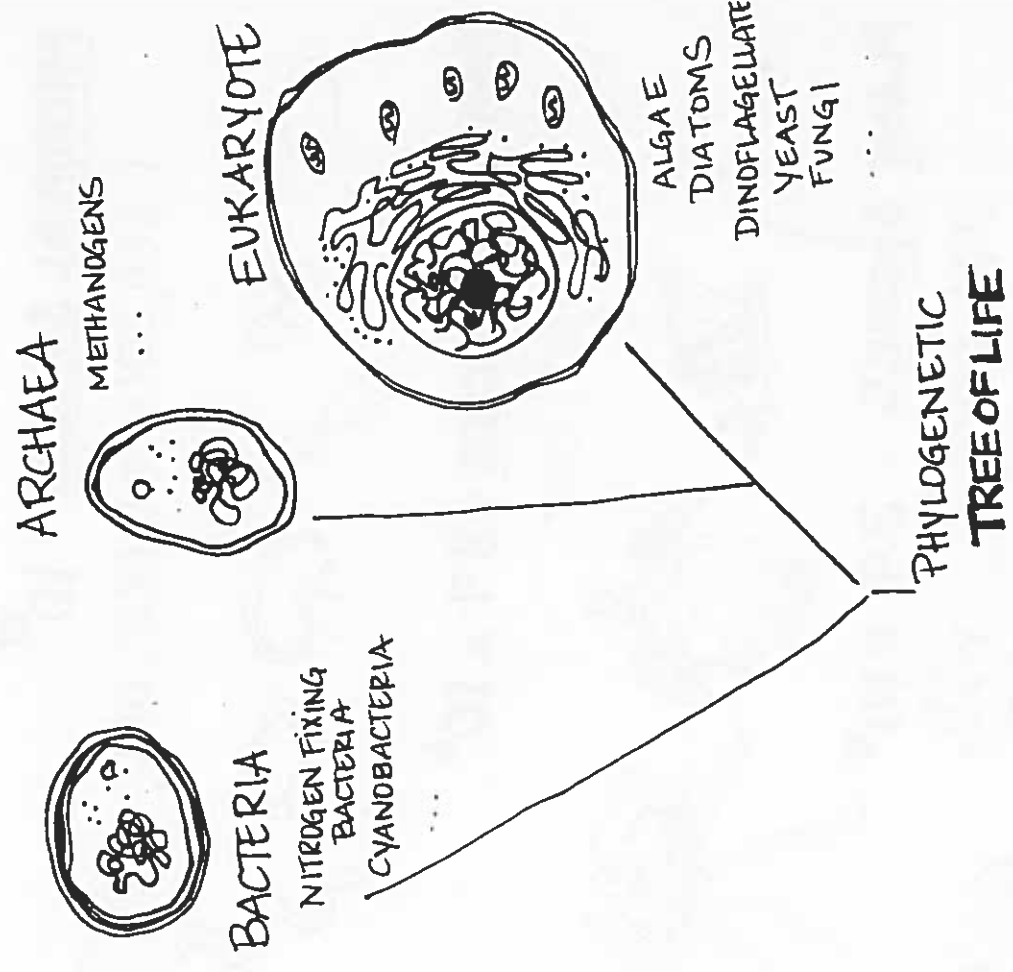
Microbes **CLEAN** contaminants

AHUPUA'A



Microbes play critical roles in the environment - **SHAPING ECOSYSTEMS** from **RIDGE to REEF**

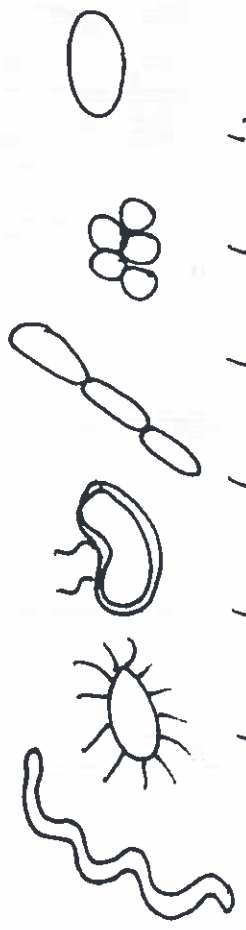
There are **3** types of microbial **CELLS**



Microbes are the **MOST**
DIVERSE form of life

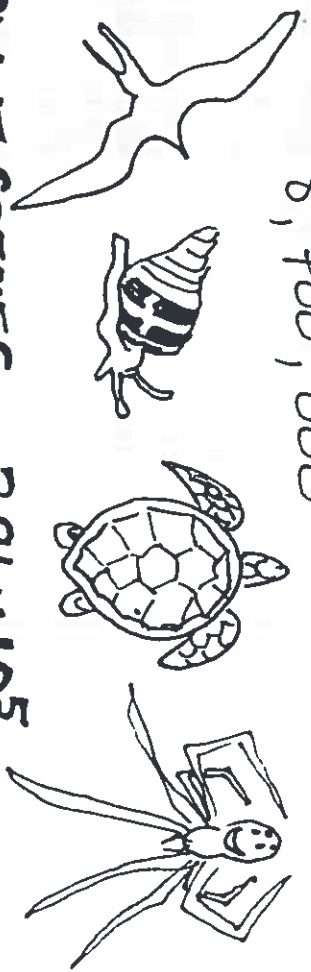
MICROBIAL SPECIES = 10^{18}

1,000,000,000,000,000,000



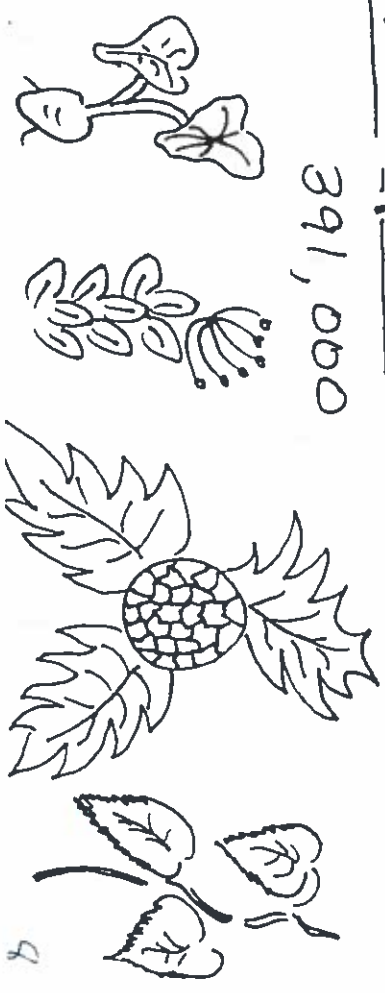
ANIMAL SPECIES = 8.7×10^6

8,700,000



PLANT SPECIES = 3.91×10^5

391,000



Microbes are **IMPORTANT**
across AHUPUA'A

