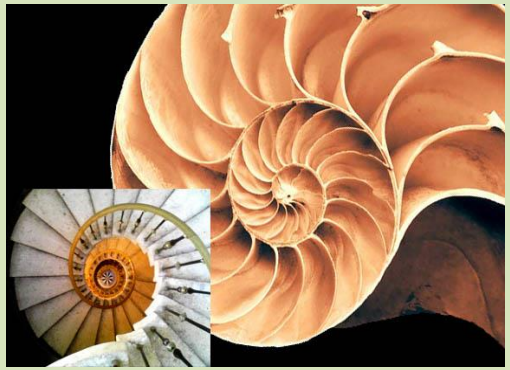
Women's History Month Presentation by International Studies Capstone Students

(Destiny Parker, Angie Juodagalvis, Hunter Cole, Sarah Claros on March 9, 2020)

"Mother Nature's a Woman too"

Her Personality, Practices, and Solutions to Human Problems

INST 490 Students with Dr. Tay Keong Tan

Why Does Nature Exist?

The Character of Mother Nature

1. Adaptive and Evolving
2. Self-Organizing and Self-Sufficient
3. Cooperative and Symbiotic
4. Frugal and Conserving: Recycles and Curbs Excesses
5. Supports Diversity and Innovation: Fits Form to Function

What is Biomimicry?

What is Biomimicry?

- "The design and production of materials, structures, and systems that are modeled on biological entities and processes."
- Ancient Greek: Bio for life, mimicry for imitation. Humanity look to Nature for answers to problems and copy from Her.
- Living organisms have well-adapted structures and materials over eons of evolution and natural selection. Self-healing abilities, environmental exposure tolerance and resistance, hydrophobicity, self-assembly, and harnessing solar energy.

Four Case Studies on Biomimicry

Destiny Goodwyn

Hunter Cole

Sarah Claros

Angie Juodagalvis

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International Studies Capstone Students
Tuesday, March 9th , 2021: 9:30-10:45am

Sunflower-Inspired Solar Plants

Destiny Goodwyn
International Studies Capstone:
INST 490 on Sustainable Development
Spring 2021

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Defining Biomimicry

"Nothing is invented, for it's written in nature first."
- Antoni Gaudi

01
Defining Biomimicry

What is a Sunflower?

02
Environmental Challenges

1. Climate Change
2. Economic Implications

Environmental Challenges

Climate Change

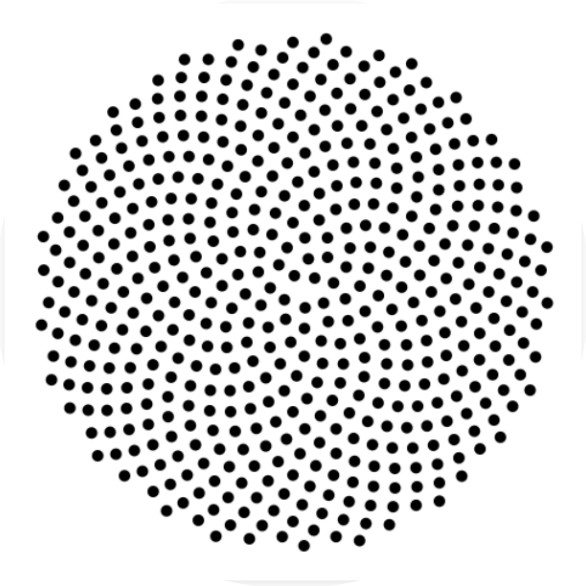
Economic Implications

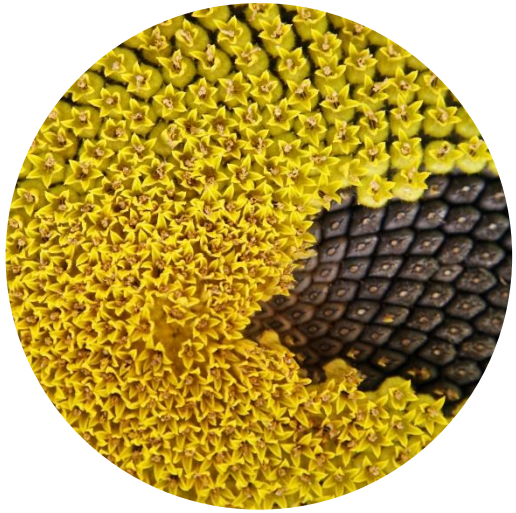
03

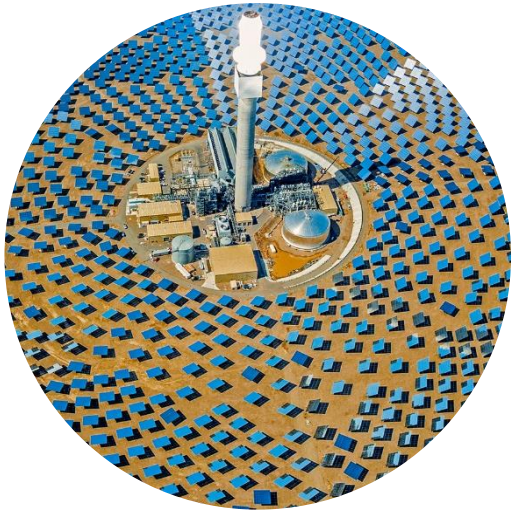
Solution: Helianthus Annus System

1. Characteristics of the Sunflower
2. Technological adoption/diffusion v. Technological Leadership
3. Kondrietive Waves & AI Revolution

Characteristics of the Sunflower



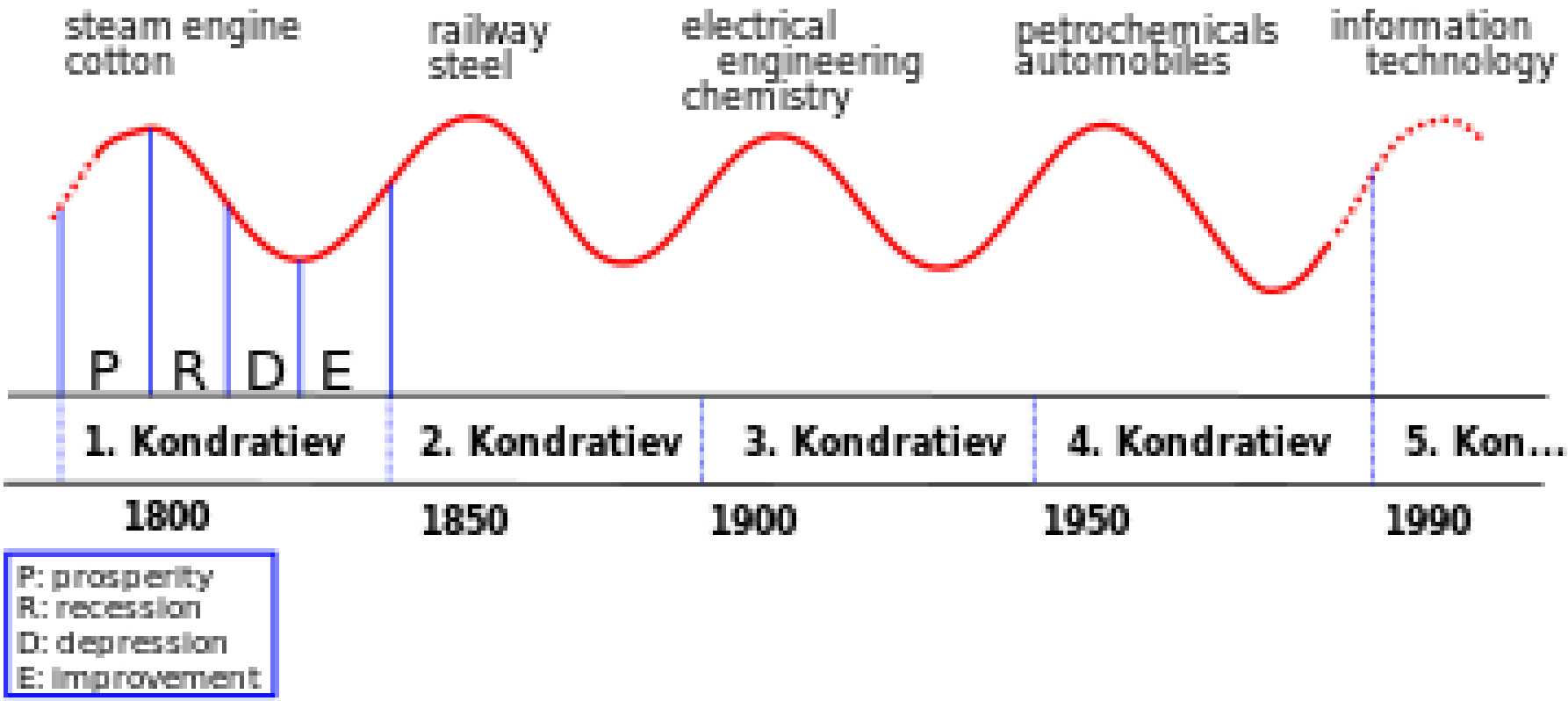




Fibonacci Sequencing

Technological Adoption & Diffusion v Technological Leadership

Kondratiev Waves



04
Real-World Application

1. Zurich Model
2. PS10 Model
3. University of Northern Colorado Solar Flower

IBM Zurich Model in Switzerland

(Airlight Energy and IBM Solar Electricity)

PS10 Model Andalucía, Spain

(Solar Power Station in Spain Works at Night)

UNC Solar Flower

(University of Northern Colorado University Solar Flower)

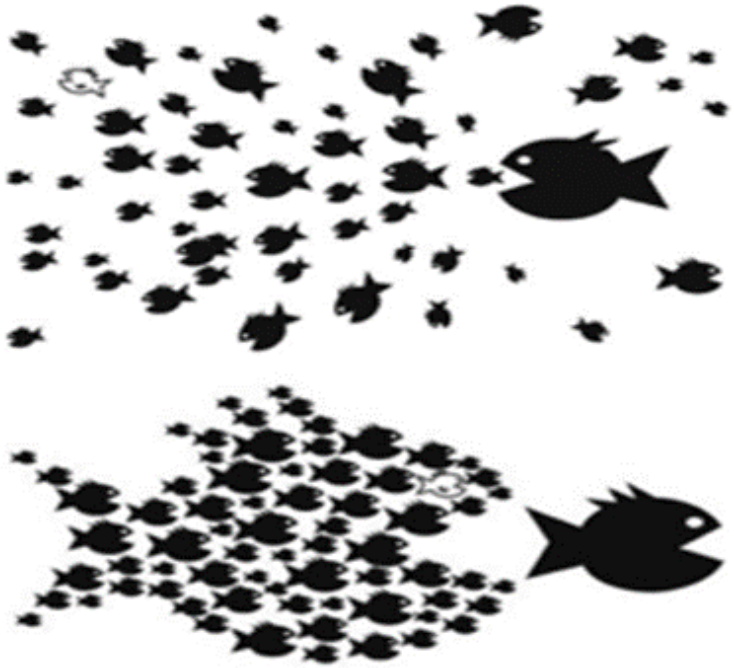
05
Sustainable Development

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

1. UN Sustainable Development Goals
2. Collective Action Problem & Solution

United Nation Sustainable Development Goals

Collective Action Problem vs. UN Sustainable Development Goals



***Collective Action Problem**: A dilemma where all individuals effected would be benefitted from cooperation, however, choose otherwise because of conflicting interests.*

– Mancur Olson

Collective Action Solution

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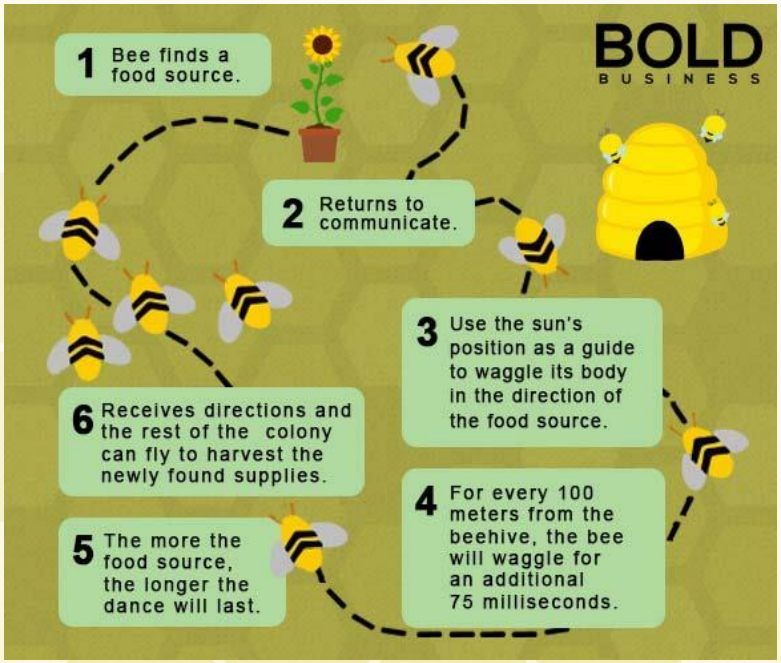
Tuesday, March 9, 2020: 9.30 – 10.45 am

The Honeybees' Hexagonal Honeycomb Structure

Angie Juodagalvis

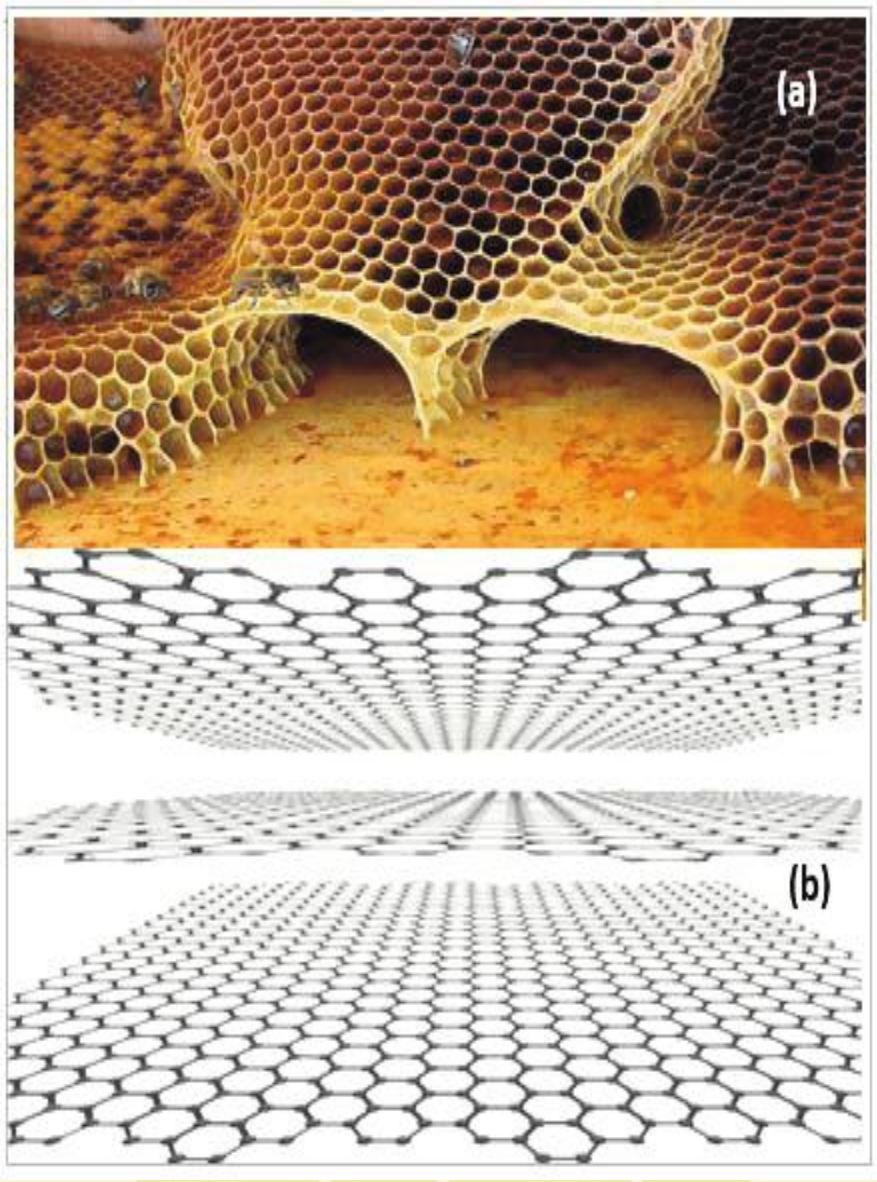
INST 490 International Studies Capstone: Senior Seminar on Sustainable Development, Spring 2021

The Honeybee



Wasteful Architecture

Beehives' Honeycomb Structure

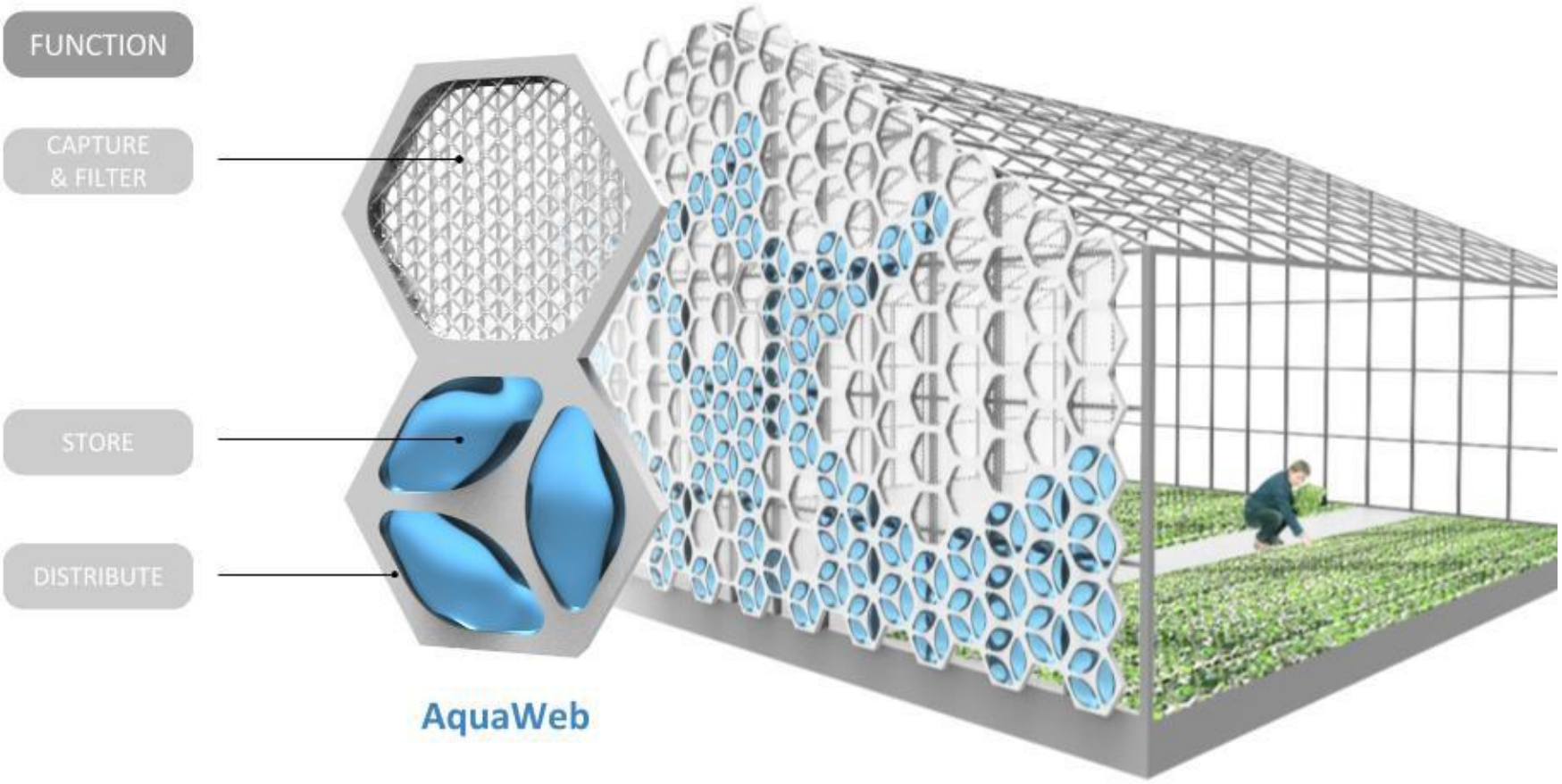



THE HONEYBEE
TEDEd
AND THE HEXAGON

Real-Life Architecture Application

MAD Sinosteel Skyscraper

Structural Strength and Efficient Use of Space



- Specific Goals: 11, 12, 13,15,17

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THE MEDICAL APPLICATIONS OF SPIDER SILK

By: Hunter Cole

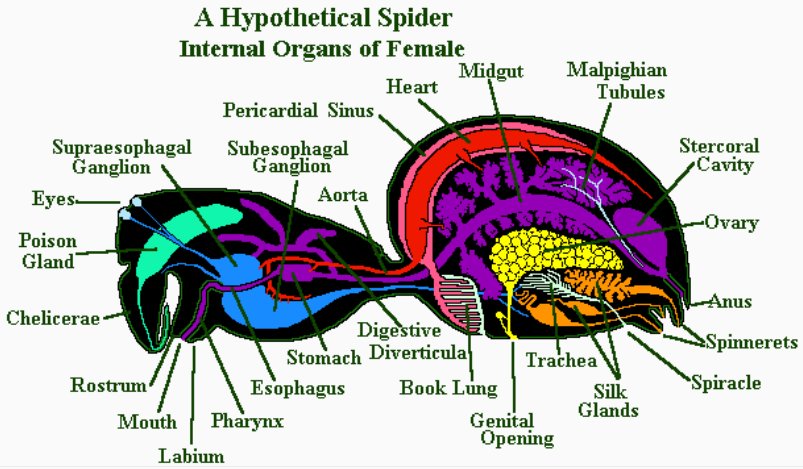
The Biology of the Spider

-Lone wolves

-Different species evolved to solve different problems

-Webs are homes and traps

-Two different kinds of silk



What is so special about Spider Silk?

-It's Tough

-It doesn't inflame human internals

-Its biodegradable

How can it be applied to the Medical Field?

-Can be used for artificial skin and stitches

-Can be used to coat antibiotics and deliver them in a safe way

-Can be used to help treat broken bones

-Much much more!

How does this improve Sustainable Development?

-What is Sustainable Development?

-Feeds into UN Sustainable Development Goals (SDG) 3, 9, 6, 14, 8

What challenges will the application of Spider Silk entail?

-The chemicals used to make it are hard to replicate

-We don't understand the spinning process

-The spiders aren't being cooperative

What does this have to do with women?

-Female spiders are the main source of spider silk right now

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Women's History Month Presentation by
International Studies Capstone Students

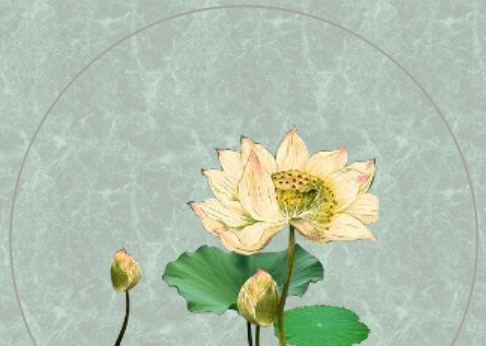
The Lotus Leaf Effect

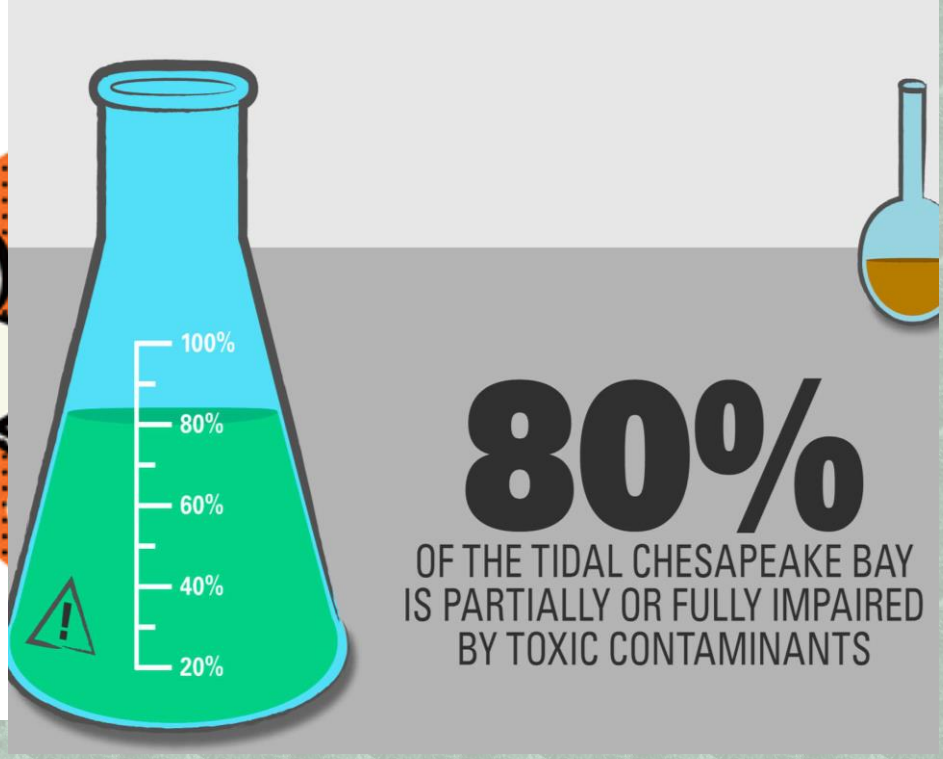
Sarah Claros, INST 490

International Studies Capstone, Spring 2021

Agenda

1. Issues to be solved
2. The lotus effect
3. Current applications
4. Potential future applications
5. Implications for global sustainability

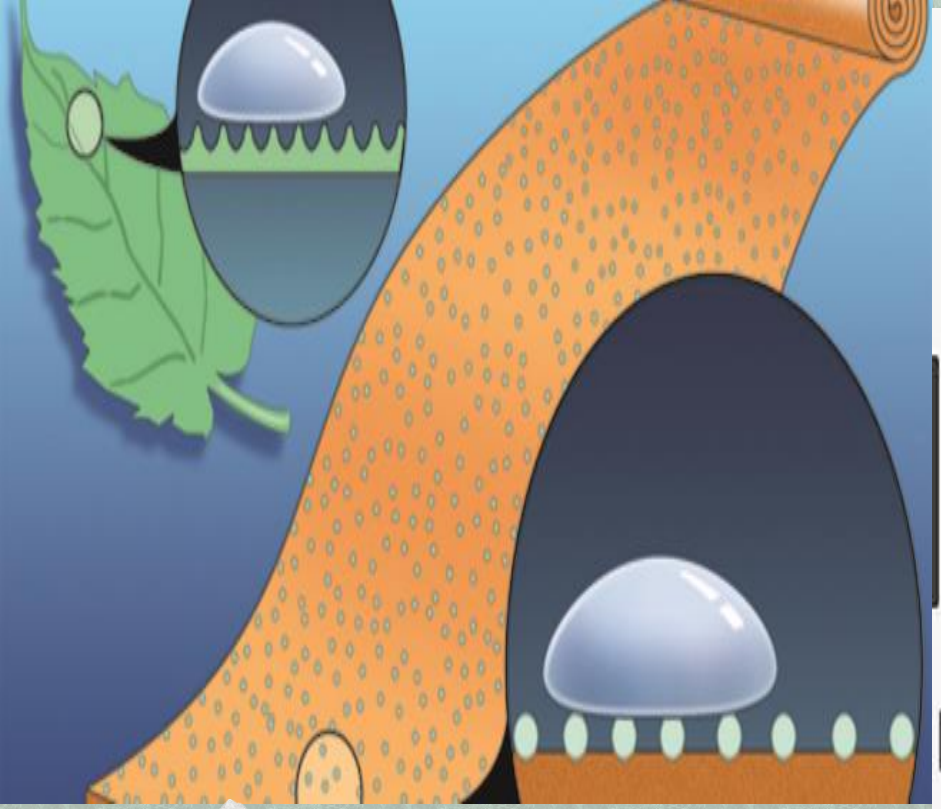
Chemical pollutants found in cleaning agents damage the environment

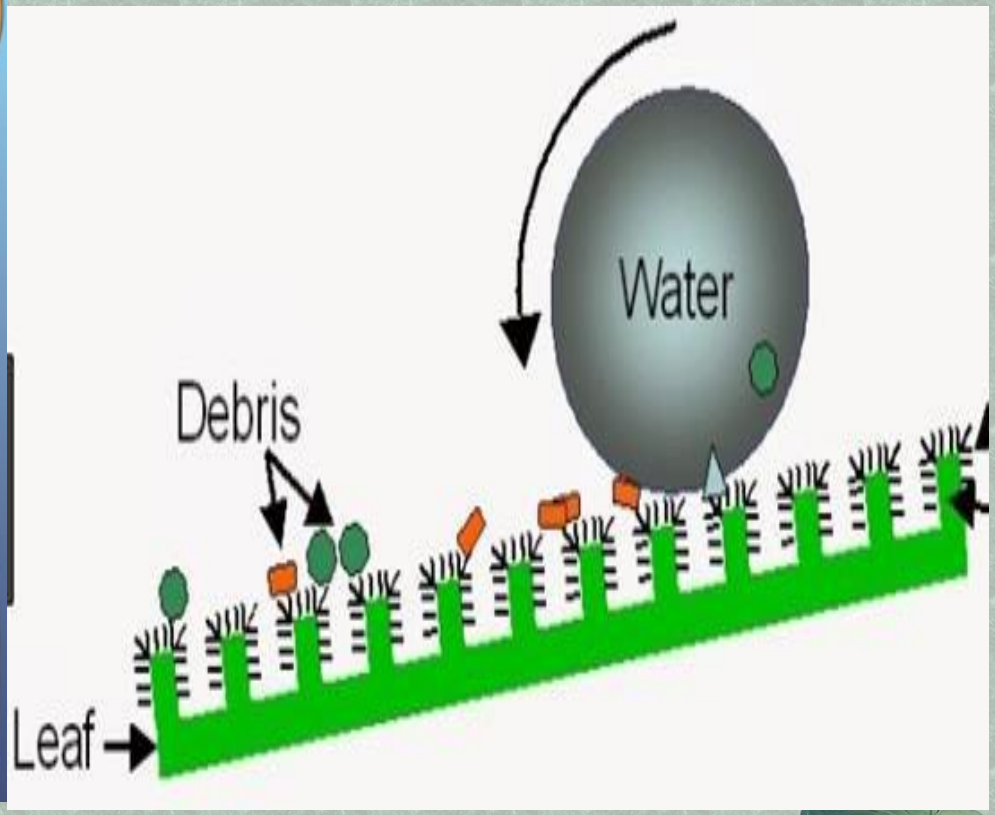
The Problem of High-Touch Surfaces during a Pandemic

“No Mud, No Lotus”:

The Hindu Scriptures, The Bhagavad Gita, considers it a metaphor for detachment

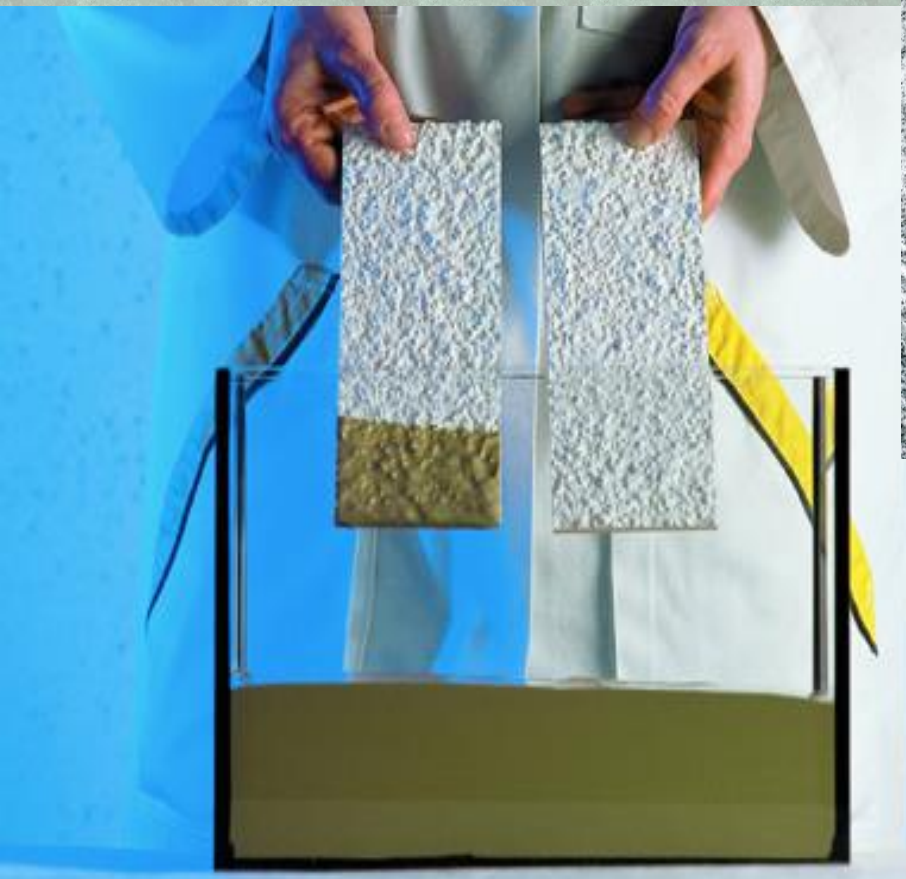
The lotus leaf can cleanse itself of dirt, bacteria, and fungi

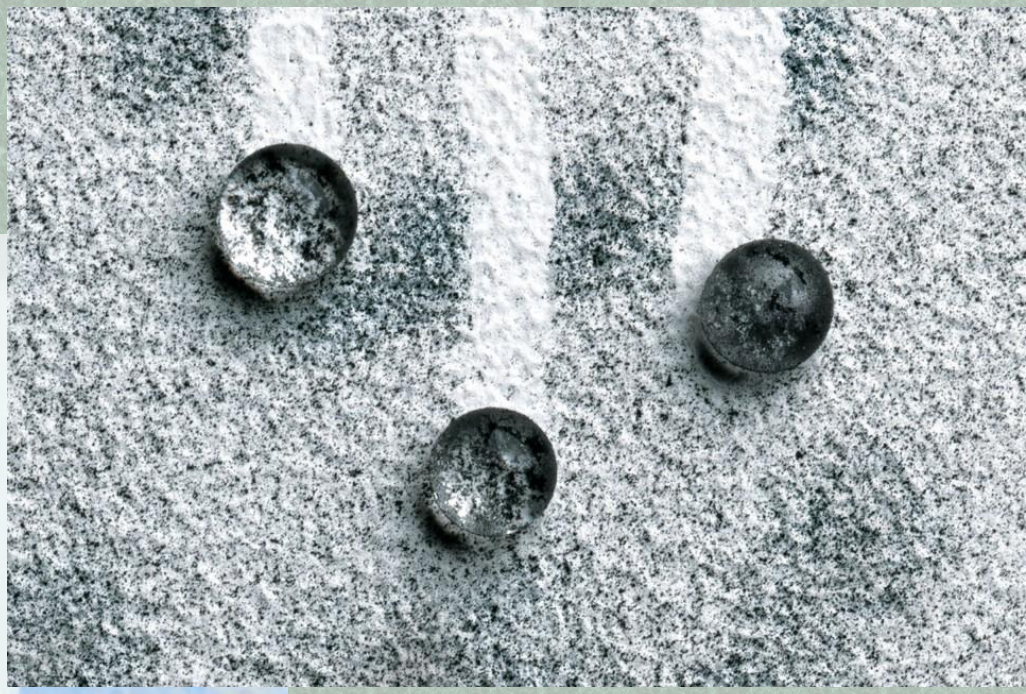




The lotus effect causes water to bead on the surface while collecting debris

Current applications of the lotus effect

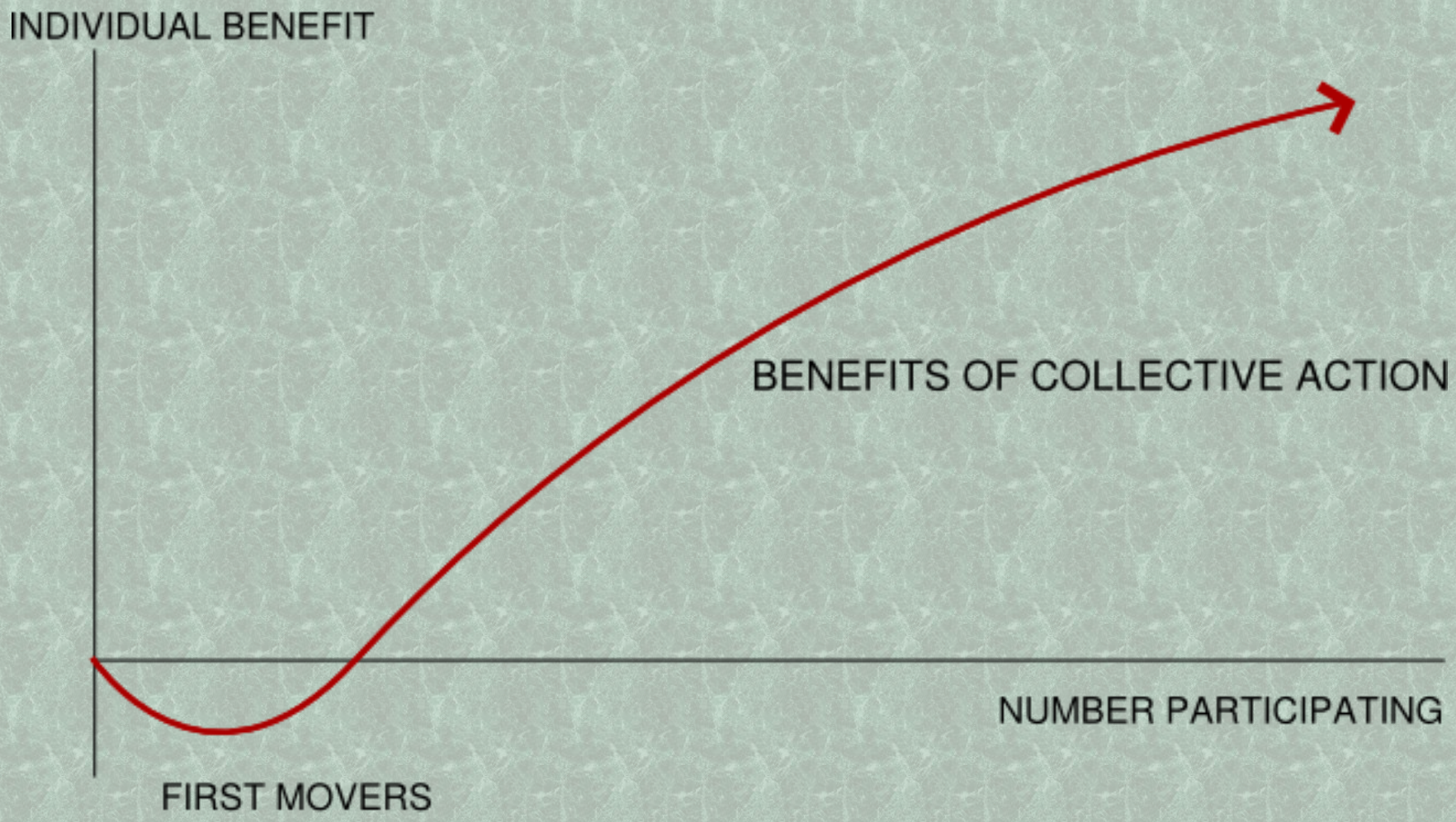




Potential implications for global sustainability

- Reduce chemical pollutants
- Reduce medical waste
- Waterproofing nanotechnologies

Collective Action Problem Associated With Further Development



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THANKS FOR LISTENING

Conclusion

1. Nature offers humanity all it needs to survive and thrive, but She has limits.
2. Her designs and practices are always sustainable, created from eons of evolution and natural selection.
3. Humans defy the rules and boundaries of Nature at our own peril.

Women's History Month Presentation by Leadership Capstone Students

Thursday, March 18, 12.30 – 1.45 pm

(See Women's Studies Program Website for Zoom Link to the Event)

"Wonder Woman Won't Wait!"

Women's Issues and Challenges in a Male-Dominated World

POSC 410 Students with Dr. Tay Keong Tan

Nothing is invented, for it's written in nature first.

Antoni Gaudi

"Nothing is art if it does not come from nature."

—Antoni Gaudi

QuoteAddicts

There are no straight lines or sharp corners in nature. Therefore, buildings must have no straight lines or sharp corners.

Antoni Gaudi Quotes

blog.miragestudio7.com

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Sunflower-Inspired Solar Panels

Destiny Parker

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Industrial Applications of Spider Silk

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The Lotus Leaf Effect

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International Studies Capstone, Spring 2021

Human Architecture

La Sagrada Familia

Works of Antonio Gaudi

Esthetics, Functionality, and Sustainability

http://bostongreenfest.org/biomimicry.html

THANKS FOR LISTENING