WHAT IF WE COULD MODIFY WINDOWS TO BE LIGHT SENSITIVE AND ADJUST SHADE ACCORDINGLY? Cat whiskers are extremely sensitive and allow cats to detect objects around them.

Cat's elliptical pupil changes according to the amount of light it takes in. The pupil is thinner during the day to allow less light in and gets wider at night to allow more light in to see better.

Cat ears are controlled by 32 muscles to help with their balance and amazing hearing ability.



Honey bees have two set of wings that strokes about 12,000 times per minute. It can also fly about 24km/hr at the speed of 15 mph.

The honey comb hexagon shape is one of the strongest shape to build with as it can efficiently pack pieces and resources together.

HONEY

BEES

Honey bees rely on flowers to gather nectar while also pollinating the flower. Benefiting both the bee and the flower in a mutualistic relationship.

> HOW MIGHT WE IMPROVE AIR CRAFTS TO TRANSPORT AND DELIVER MORE RESOURCES IN SMALLER YET EFFICIENT BODIES?

BUTTERFLY'S CHRYSALIS

WHAT IF WE COULD CHANGE THE TRANSPARENCY OF OUTDOOR TEXTILE & FABRIC WITH THE CHANGING SUNLIGHT?

Butterfly wings are made of tubes that are covered with thin tissue and scales. The wings help carry heat to the body from basking in the sun light. Inside the chrysalis, a developing butterfly wings are collapsed around its body. The butterfly must spread its wings after emerging from the the chrysalis and wait for its wings to dry and harden before it can first fly.

The chrysalis is made from silk threads and becomes transparent before the butterfly is ready to come out. ICD/ITKE Research Pavilion at the University of Stuttgart designed a pavilion inspired by a sea urchin's skeleton. The pavilion was constructed out of polygonal timber plates and explored the biological principles of a sea urchin's plate skeleton morphology. This bionic structure aimed at incorporating biological properties to architectural design with a module system of plate components and robotically fabricated finger joints.





Synthetic shark skin swimsuits were inspired by the sand-like texture of a shark's skin and its movement through water. It is said to reduce drag and increase energy efficiency and flexibility as it compresses the body and stop skin vibration. The synthetic material consists of tiny jagged scales on a flexible skin usually made out of nylon, elastane or a polyester fabric.

SYNTHETIC SHARK SKIN SWIMSUIT



The salvinia molesta is a weed with egg-beater shaped hairs that can hold and trap water as well as being able to foat on the surface of water. It traps little pockets of air and can cling to water with sitcky hair tips. Researchers at Ohio State University have been using the salvinia molesta as inspiration for new types of waterproof coating for materials. The hairs create a buoyancy and clingy-ness to water where researchers think they can apply this to boats and aquatic vehicle to reduce friction and drag while increasing the buoyancy.







MANY CHRYSALIS REFLECT THE HABITAT IN WHECH THEY ARE FOUND. THIS HELPS, THEM CAMOUFLAGE WITH THE SURROUNDING ENVIRONMENT.

BUTTERFLIES EATS ITS WAY OUT OF THE CHRYSALIS FROM THE BOTTOM TO ESCAPE -



BUTTERFLIES ONLY DRINK NECTAR FROM FLOWERS AS WELL AS POLLINATING IT. THEY DRINK FROM THEIR LONG NARROW TUBE IN THE MOUTH.





SILK THREADS

WILL STICK TOGETHER

AS IT WRAPS AROUND

THE CATERPILLAR,

BUTTERFLY WINGS BASK IN THE SUN LIGHT TO GAIN HEAT AND WARM UP. - OL

RIGHT BEFORE THE BUTTERFLY WHEN IT CAN COME OUT WHEN THE CHRYSALIS IS CLEAR.



THE CHRYSALIS





THE LIFE CYCLE

THE CHRYSALIS

THE ADULT BUTTERFLY



THE CHIRYSALIS WILL HARDEN WITH FRESH AMR,

THE BUTTERFLY WILL EMERGE FROM THE CHRYSAUS WHEN IT FEELS READY.

THE CHRYSALIS

CHRYSALIS to TENT



A butterfly's chrysalis will change the appearance to a transparent protective cover about a day before the adult butterfly emerges. The clear chrysalis shell tells the butterfly that it is ready to break free and discharge from the chrysalis.



Opaque

Using a special fabric to change and adjust the opacity, we can design tents to change their appearance. By directing how light reflect off from the tent, we can adjust the material of the tent to become more transparent or opaque to camouflage with the environment.

Changing the transparency of the tent's material allows the tent to be more versatile throughout the day and night. Making a tent transparent allows you to look out into the sky at night while giving you the protection from bugs and other pests.



Transparent