



OPEN MIND. In response to the challenge to make a sitting structure with yarn, the designers created a new and unfamiliar object. Design: Maria Duke, MICA.

UNLOCK IDEAS

USING MATERIALS FOR INSPIRATION

The projects shown on the following pages were created by design students at Maryland Institute College of Art (MICA). The goal of these experiments was to unlock creativity by exploring the unique properties of materials. Whereas traditional design methodologies focus on sketching, our approach emphasizes hands-on prototyping with three-dimensional structures. Thus the works shown here are not slick finished products (or glossy 3D renderings of slick finished products). Instead they are active, raw projects produced with real materials and real tools in a studio environment.

To initiate these experiments, we asked a group of design students to address a particular problem: make a person comfortable while sitting. Naturally, each designer immediately began thinking about chairs. Then we asked them to put aside their ideas about chairs and focus instead on a particular material (foam, rope, wire, cardboard, metal rods, etc.). The designers explored each material, uncovering its properties as a surface, structure, and fastener. They could not rely on what they already knew about chairs: legs, back, seat, arms, and so on. By exploring materials rather than pursuing a preconceived end product, these designers began thinking in new ways.

The best way to learn is by doing. In the exercises documented here, designers stated a problem and then solved it with a randomly assigned material. Try it yourself and see what ideas emerge. Then, change materials and try it again. See how your results are different. This exercise is a kind of game. It is also a tool for inventing, brainstorming, and generating ideas. You can apply it to any type of problem—not just creating an object, but planning a process, studying a system, or designing a space. Kids, artists, designers, and even business people can broaden their thinking with this technique.

EXPLORING MOLDED FOAM

In the experimental project shown here, the challenge was to use molded foam to make a structure for sitting. Thus the project did not focus on “designing a chair” as an end result; instead, it focused on understanding sitting, comfort, and shape in a broader way.

It sounds easy to design a chair with foam, as this material is already associated with comfort and padding. However, the unique properties of molded foam can inspire surprising solutions.

Foam comes in many forms. Urethane foam sheets are used for traditional padding and upholstery. Closed-cell foams like Styrofoam insulation and polyethylene-extruded shapes are used for packing and flotation.

We used sheets of high density urethane foam to create an object that transforms from an upright to a horizontal position, supporting either a seated or reclining body.



AVAILABLE MATERIALS. We used readily available products like carpeting foam and packing materials to test ideas. How much structure is enough? Can we use other objects like walls or pillars to help us? Foam experiments by Cecilia Oh, MICA.



TRANSFORMABLE OBJECTS. The North Tiles is a transformable object made from fabric-covered foam sheets. Design: Ronan and Erwan Bouroullec



MOCKUPS. In this design, modular geometric shapes contrast with the softness of foam. We used small paper models for quick prototyping. Making cardboard mock-ups at actual scale helped establish dimensions and uncover overall structural issues. The volume shown here is hollow. In order to be useful as a seat, each triangle needed to become a base for a solid truncated tetrahedron.



FOAM CHAIR/SLIPPER. The object is designed to transform with use. It can be used for sitting during the day and lying down at night. When put back into a chair, the tetrahedrons fit inside like pieces in a puzzle. Design: Haiji Park, MICA.

EXPLORING YARN

Here, the challenge was to use yarn as a primary material in a sitting object. An obvious approach would have been to use skeins of yarn as stuffing and padding. Instead, we created surfaces and fasteners with yarn. Inspired by the craft of embroidering with a round tambour or hoop, we hand-embroidered the yarn around a welded metal frame to create a transparent rocker. Square steel mesh was attached to the welded frame to create an embroidery surface, similar to the plastic canvas used for needlepoint. Users can sit inside the hoop and add embroidery.

YARN AND METAL CHAIR. Thanks to the round shape, the prototype can be easily transported to the studio from the metal shop. Making small scale models is important to the thought process. Embroidery details can be added to the surface by someone relaxing in the chair. Design: Maria Duke, MICA.



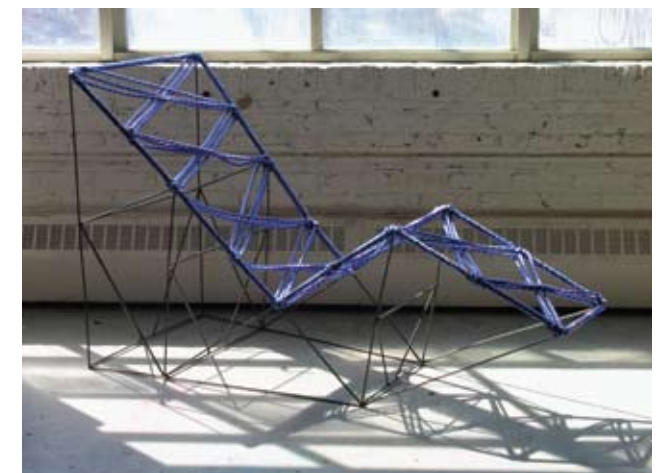
EXPLORING ROPE

How can rope be used to make a chair? To create the object shown here, we studied knots and knotting techniques. We created a minimal metal frame, welded from metal rods, to support the rope structure. The resulting object is light, both physically and visually.

To quickly test the welded structure, we wrapped it tightly with ordinary plastic wrap. Several problems emerged during the testing process, including the bending of the structure under weight. So, we went back to the welding shop to add more structure.



ROPE AND METAL CHAIR. We resolved the issue of the rope slipping along the metal frame by wrapping rope around the metal rod to create spacers between the knots. Design: Lily Worledge, MICA.



EXPLORING FELT

Industrial felt is a nonwoven textile that comes in sheets. It is easy to cut, fold, and fasten. Here, the challenge was to use this soft, flexible material in a structural way to support the human body.

Rolling the felt into cylinders yielded strong building elements. Industrial felt is available in a variety of densities; the denser the fibers, the more expensive the material. To keep costs down while using a lower-density felt, we reinforced the bottom parts of some of the rolls with cardboard.

The entire structure is fastened together with webbing straps. The piece can be taken apart to be turned into a series of blankets or to be cleaned..



FELT CHAIR. Buckled webbing keeps the parts of the chair together. Books and magazines can be stored between the chair's outer layers. Design: Huei-Ting Wu, MICA.



EXPLORING CORRUGATED CARDBOARD

Designers have experimented with corrugated cardboard as a material for decades, using this material to make inexpensive, lightweight furniture. In the prototype shown here, we created a honeycomb structure and carved out a space for the body. The whole structure is secured with industrial plastic straps.



EXBOX BENCH. This cardboard lattice bench consists of a potentially infinite numbers of sheets slotted together to form a collapsible seating arrangement. Designed: Giles Miller,



CARDBOARD CHAIR. Found throughout nature, honeycomb structures are strong and light. Our cardboard chair is easy to move. Design: Hyeshin Kim, MICA.

EXPLORING WIRE

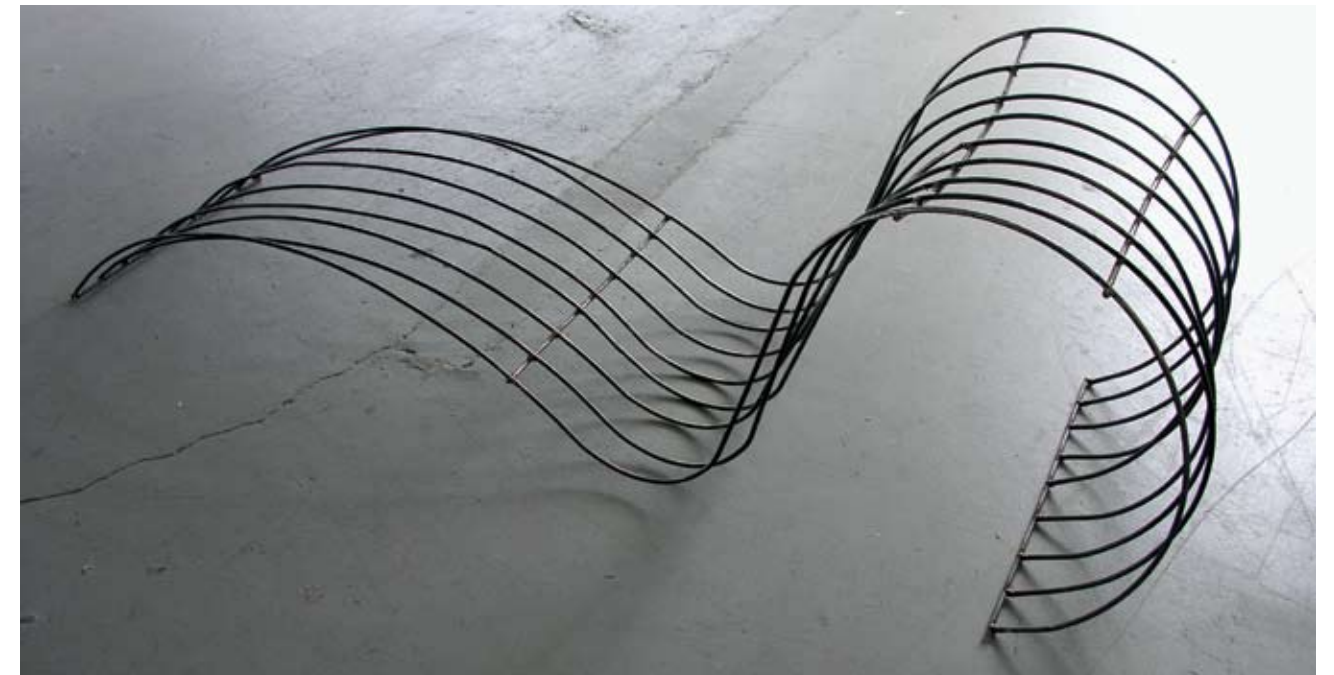
Wire springs are hidden inside many common furnishings, including mattresses and couches. The donut-shaped chair shown here is inspired by springs and coiled wire. A continuous ribbon of fabric ribbon is woven through the wire, helping to control the material as well as creating a soft outer surface. The structure folds for portability.



WIRE CHAIR. The completed prototype is tested for comfort and folding. Design: Whitney Campbell, MICA.

EXPLORING METAL ROD

Metal rods are similar to wire, but they are more structural and therefore lend themselves more easily to the problem of supporting the human body. Almost invisible, the object shown here could be used outdoors as well as indoors. If placed in a garden, it would cast almost no shadow, allowing plants and grasses to grow through it. The object is sculptural as well as functional.



INVISIBLE FORM. The structure is light, physically and visually. Design: Samantha Pasapane, MICA.

EXPLORING RUBBER

How can rubber become a chair? Rubber is formed through many processes, including dipping, molding, and inflating. The experiment shown here is made from recycled bike inner tubes. By stitching cut inner tubes together, we created a durable yet elastic sack. When stuffed with clothes while traveling, the object can be used as a place for sitting, resting, and reclining against walls.



RUBBER CHAIR. Old inner tubes were salvaged from a local bike shop—an excellent source of free rubber. The piece serves as a backpack or a wearable storage unit as well as a chair (similar to a bean bag) or as a place to sleep. Design: Katie Coble, MICA.



EXPLORING PLYWOOD

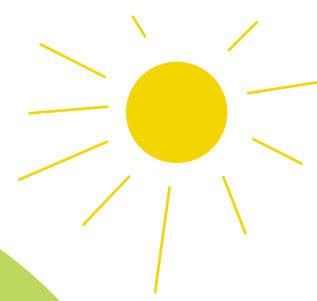
Plywood has many uses in furniture making. Explored here is the idea of a see-through structure that can be shipped flat and assembled by the user. The empty spaces inside this reading chair can be used for storing books and magazines. The pieces left over from the production process could be made into complementary objects such as bookshelves and light fixtures.



PLYWOOD CHAIR. The cut elements are designed to notch together without glue. The finished chair resembles an open skeleton. Design: Irina Dukhnevich, MICA.



SOLVE THIS CHALLENGE:



**MAKE PERSON
COMFORTABLE IN HOT
WEATHER**

**USE OBJECTS FROM THE
MATERIAL BAG**



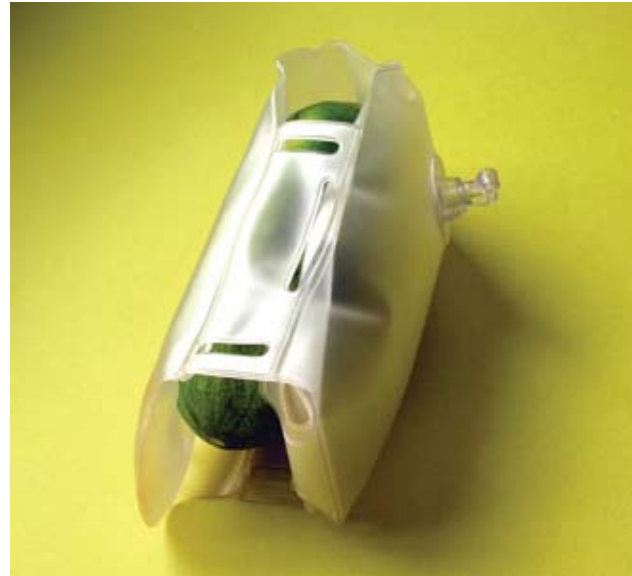
**DO NOT THINK OF
EXISTING SOLUTIONS
THINK ABOUT
PROPERTIES OF THE MATERIAL!**

TIME: 10 MIN.

USING MATERIALS FOR INSPIRATION

BRAINSTORM WITH MATERIALS

Back to the drawing board. After getting a reality check from our shopping trips, we try not to get discouraged. An exercise that helps to break away from the “everything has been done” block is to brainstorm with materials. This exercise is similar to the method described in the first chapter of this book, where we used materials for inspiration. To use this sketching exercise, establish a simple problem, such as how to carry groceries, and limit yourself to one material and see what kinds of solutions you can come up with. For example, an adhesive label will inspire different solutions for delivering produce than plastic mesh, an old T-shirt, or an inflatable structure will.



CUSHIONING WITH AIR. Here is an idea for a multiuse inflatable egg or fruit package. Air is a good insulator, keeping produce cold. In a one-shape-fits-all design, each cell will fit an apple or banana. When inflated, it will take the right shape.



MATERIALS LIBRARY. It is helpful to create your own library of inspiring materials. There are also companies such as Inventables, Material Connexion, and Materials Mont who provide this service to designers. A subscription gets you information and physical samples of new and experimental materials.



FREE SAMPLES. Many manufacturers are happy to provide designers with samples of their materials. Here, we got a sample of mesh from the manufacturer. It was enough material to make a mock up of a potential solution.

DIFFERENT MATERIALS INSPIRE DIFFERENT SOLUTIONS. YOUR FIRST CONCEPTS DON'T HAVE TO BE REALISTIC. THINK OUTSIDE THE BAG!

Take the process a step further and work hands-on with ordinary yet unconventional materials, like plastic straws, soda bottles, string, and bubble wrap. This approach encourages creative thinking. It also helps you understand the structural properties of materials.

Any material can be used as a surface, a structure, or a fastener. Use items that you have on hand to try out different ideas in a direct, physical way. Try not to think about how you have seen the problem solved before. To make a first round of quick mock-ups, we used existing bags, food packaging, paper pulp trays, and even vertical window blinds. Being resourceful pays off, since supply costs add up.



WORK WITH WHAT YOU HAVE. An old T-shirt was cut to make a stretchable sack. Design: Inna Alesina.



SEE THROUGH MATERIALS. We brainstormed about a speedy check-out system where all the items would get scanned in a single sweep. We designed several bag prototypes with transparent materials for scanning in the bag. We realized that every kind of produce has its own shape and you can't fit bananas into a shape made for oranges. Could universal shapes work? Concept: Benjamin Howard, MICA.