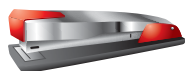
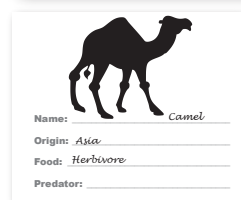
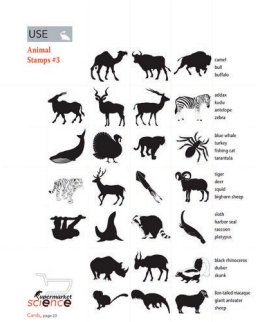


PARENT HELPER GUIDE



Introduction to Supermarket Science Materials

What You Need:



Parent Helpers



How to Use These Materials

Supermarket Science Materials are organized into thematically linked sets with experiments and activities as well as background information that makes them easier to do. There are also a bunch of simple, fun art and writing projects. All of the activities can be done alone or in conjunction with other project sets. Choose activities that are developmentally appropriate for your children.

All Supermarket Science Materials are primarily geared toward students in elementary and secondary schools, as well as their parents and teachers, but can be expanded to higher grades. The activities are designed to advance the understanding of concepts of biology, ecology, geology, and sociology based on local resources like a backyard or a local grocery store. All of the materials in this set and others link the Core Curriculum Standards. Use these Standards to focus the activities to a particular grade level.

There are also LEARN, SHOW, USE, DO, and TEACH pages. LEARN pages are designed to be printed out and given to the kids. They contain explanations, stories, or diagrams. SHOW pages usually present interesting photographs or illustrations that demonstrate specific concepts. USE pages are created as supplemental materials for the activities and experiments. Animal Cards and Map Cards are examples of USE pages. And finally, the DO pages contain the actual activities and experiments—please print as many copies as you need and give them to your children. Please use the back of these pages as scrap and add additional pages as needed.

On some pages, there are icons of animals. For example, an activity about elephants might have an elephant icon next to it. These icons can be used as keys to link information between all of the Supermarket Science Materials.

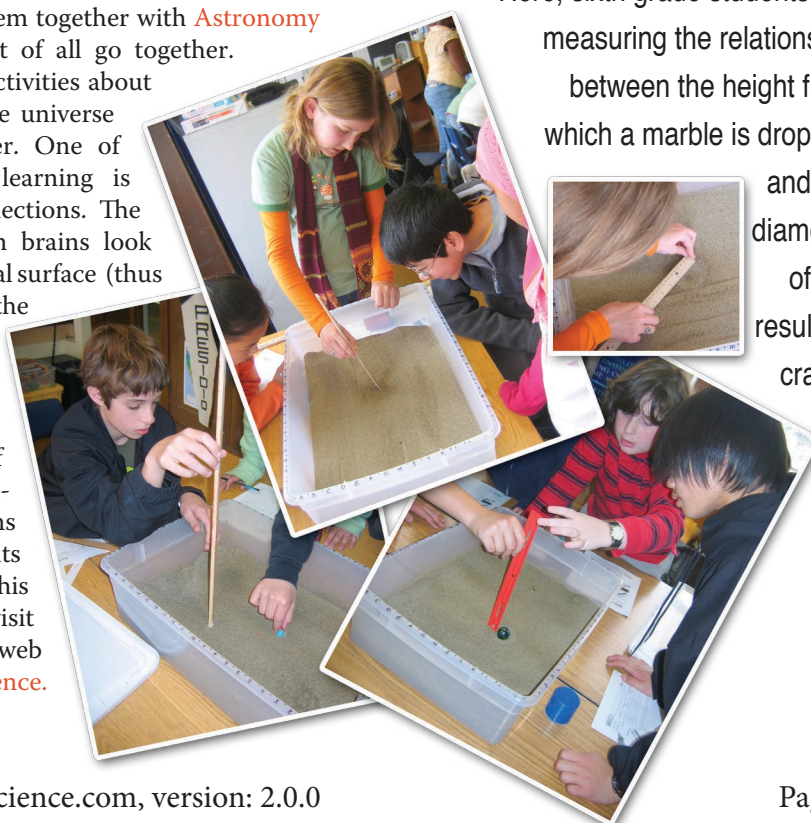
Most DO pages have a What You Need list of items in the margin under the title of the activity. This is a quick reminder for what children should have while doing the activity. It might look something like a list on the right: Animal Stamps pages, Animal Cards pages, research books, pencil, scissors, glue, etc.

Some of the activities use of cards from the Supermarket Science Cards or Stamps USE pages. Creating taxonomies is part of the scientific process. Card games and activities allow kids an opportunity to practice this skill.

While the Patterns in Nature activities can be done all on their own, consider doing them together with Astronomy and Impacts—they sort of all go together. But frankly so do the activities about animals—we live in one universe and things tie together. One of the greatest joys in learning is discovering these connections. The convolutions of human brains look very similar to brain coral surface (thus the name) and follow the pattern for packing.

Think of these activities as inspirational examples, jumping off points. For more activities and suggestions by teachers and parents on how to explore this material with kids, visit Supermarket Science web site at SupermarketScience.com.

Here, sixth grade students are measuring the relationship between the height from which a marble is dropped and the diameter of the resulting crater.



Introduction and Main Ideas for Supermarket Science Patterns in Nature



Words in red are
vocabulary words.
They are used in
a word puzzle **DO**
pages.

Summary and Introduction to Patterns of Nature

The **Supermarket Science Patterns in Nature** materials were developed to foster scientific inquiry and support guided exploration of visual patterns found in the world all around us: from brunches of trees to cracks in the pavement. While the activities differ by grade level, the overarching theme is the same: within nature, many similar patterns can be seen in objects of wildly differing sizes and materials. Often, objects with similar patterns possess an underlying similarity of construction. In these activities, children are asked to analyze visual data and to come up with scientific conclusions through logical reasoning.

Main Ideas

Research

- Children are asked to research basic information about different phenomena using visual and written information provided in this book (a given source) and a library or the Internet (a new source).

Precision

- Each label, name, or word has a specific meaning that all scientists in the same field understand to mean exactly the same thing.
- Descriptions of objects and events need to be precise enough to limit misunderstanding or misinterpretation by the readers as much as possible.
- “Fuzzy thinking” is not allowed.

Logical Thinking

- There are two pathways in science: deduction and induction. Deduction is a process that puts together bits of data and evidence to build a theory—it’s bottom up reasoning. Induction is the process that starts with an idea and then looks for data and evidence to support it—it’s top down reasoning.
- Logical reasoning is a formal way of thinking (usually deductive) where each successive thought is built upon the previous one; as long as each link in a chain of logical reasoning is true, the end conclusions are true.

Classification

- Objects can be grouped together based on visual analysis.
- Objects can be grouped according to inferred physical characteristics based on visual analysis.





"The Turbulent Orb" by
Ned Kahn.

Going to a Museum

There are many science museums that have exhibits that model patterns in nature. In particular, Ned Kahn is an artist and exhibit designer that specializes in building exhibits that highlight particular patterns in easy to understand ways [you can learn more about his work on his site: nedkahn.com]. The swirling, chaotic patterns visible in the **Turbulent Orb** and the **Jovian Cloud Tops Exhibits** are but two examples of exhibits designed by this artist. These exhibits demonstrate the swirls and twirls seen in the movement of clouds over the Earth and on other planets like Jupiter and Neptune. These exhibits are widely available around the United States and other parts of the world. To learn more about how to visit these exhibits in person, please check out the following sites on the Internet:

Exploratorium Museum in San Francisco, CA:

exploratorium.edu/exhibits/turbulent-orb

Questacon, The National Science and Technology Center in Australia:

questacon.edu.au/visiting/galleries/awesome-earth/exhibits/turbulent-orb

Lafayette Science Museum in Lafayette, LA:

lafayettesciencemuseum.org/turbulent-orb

National History Museum in London, in The United Kingdom:

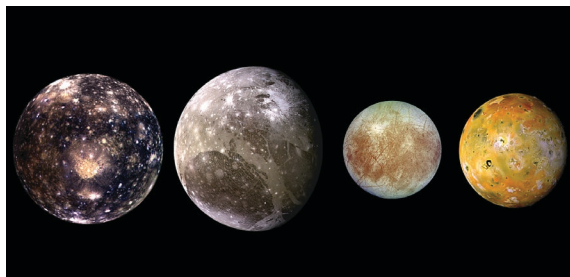
nhm.ac.uk/services/ibd/te/e/tl/2_content.htm

The diameter of the **Turbulent Orb Exhibit** is approximately half a meter. The diameter of Jupiter is approximately 150,000,000 meters. That's 300,000,000 times bigger than the **Turbulent Orb Exhibit**.

How big would the turbulence be if it was resized to Jupiter proportions? To find out multiply the width and then the length of the turbulence by 300,000,000. The answer will be in centimeters. To change the answer to kilometers, get rid of the last five zeros in the numbers (there are 100 centimeters in a meter and 1,000 meters in a kilometer). Now the answer is in kilometers. Easy!



Ned Kahn's exhibits: on left,
modeling convection; on right
"Jovian Cloud Tops."



Galilean Moons—the largest
moons of Jupiter.



Visit Lunar Atlas to find the
names of the craters on
the Moon at:
lpi.usra.edu/resources/cla/

What You Need to Conduct These Activities



Parent Helpers



What You Need

Some of the concepts covered in this section are complex, but humans are very good at identifying patterns. Even very young kids will be able to spot an impact crater or a spiral pattern or a branching structure. So make sure to have adequate time set aside for interesting discussions. Encourage your children to write poetry and draw imagery based on the ideas they learn here.

For patterns activities that use **Cards**, there are different **DO** pages to accommodate different developmental levels. For elementary school students, use the **DO** page titled **Searching for Shapes**. For middle school students, use the **DO** page titled **Looking for Patterns**. For high school students, use the **DO** page named **Forces that Shape Nature**. The suggested grade levels for each page are for guidance only. If you feel that a **DO** page is either too easy or too difficult for your children, feel free to use higher or lower level **DO** page as appropriate. Or do all of them!

The materials you will need for each group of kids:

- Pencils and dark markers (to outline the cracks)
- Scissors and tape or glue
- Ruler or measuring tape
- Chalk—if you want to outline the crack in the pavement or stucco
- Milk and food coloring
- Brown paper bags
- Two soda bottles and a connector or plumbers tape
- Parent Helpers to help kids with setting up, clean up, and organization



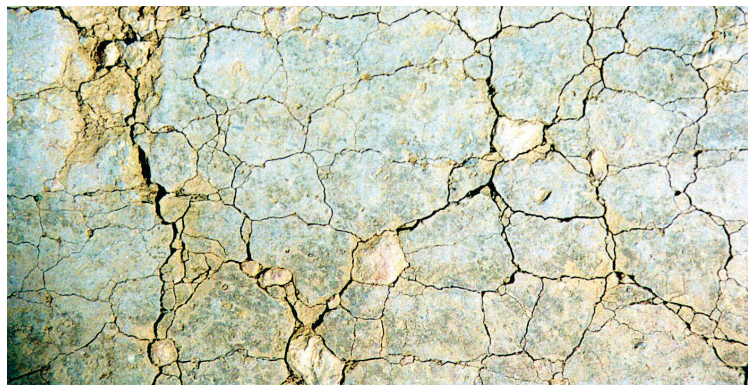
Do More

Ideally, **Patterns in Nature** activities will be used as a starting point to explore phenomena kids observe every day. We hope it encourages real scientific curiosity and teaches something of underlying natural processes. These activities can easily be extended to experiences both inside and outside the classroom or home.

Many of the images used in these pages are from NASA. You can go to [Nasa.gov](https://www.nasa.gov) to discover more images that relate to observable patterns in nature.

You can use images you discover or collect on your own to make more **Patterns in Nature Cards**—there are blanks provided. Not only will this give you another window into our amazing universe, but you can use your cards to play games.

And please, what ever you do, send us your photos and stories so we can share them with the world!



You can use water and a paint brush to outline cracks in stucco. Water won't do any damage and will make it a bit easier to see the pattern. Any time kids engage multiple senses in understanding the phenomenon is a good thing.