

PARENT HELPER GUIDE



Introduction to Supermarket Science Materials

What You Need:



Name: Camel

Origin: Asia

Food: Herbivore

Predator: _____



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.

Electromagnetic spectrum might be a difficult subject to master for an elementary school kid, but thinking about colors is not. We believe that even young kids are able to understand a lot of the material covered in these pages. If you are part of a school, then science buddies teams can work together—older kids can learn the material and show off what they know to their younger science buddies. At home, older siblings can do the same for their younger brothers and sisters or even their parents and grandparents. Explaining the material to others is a great way to master difficult concepts. So plunge in and have fun. This set of activities shows just some possibilities of learning about electromagnetic spectrum. There are as many ways of learning as there are people doing it. We encourage you to come up with other ways of explaining colors and light. 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.

The black and white images of the girl on the bottom is shown using information from just one color each: red, green, blue.



Introduction to Supermarket Science Electromagnetic Spectrum Materials



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

Summary and Introduction

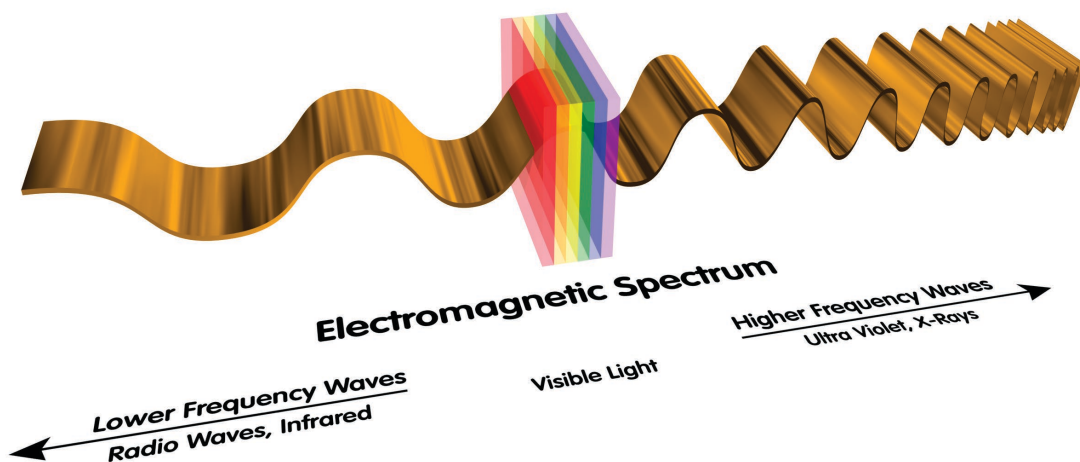
These activities and experiments introduce students to the electromagnetic spectrum and colors. While some activities seem difficult, most children are able to at least partially complete the experiments. Encourage them to do as much as possible. The accompanying **TEACH** and **LEARN** pages should provide enough information for teachers and parent helpers to assist their students. These pages are for curious adults getting ready to answer those tough questions kids ask just before bed time or while visiting museums. There is a lot of information here and some is quite difficult, but it is all fun.

Electromagnetic spectrum includes all electromagnetic waves from the shortest wavelength to the longest radio wave lengths. In order of decreasing wavelength, these are radio, microwave, infrared, visible light, ultraviolet, x-rays, and gamma rays. The wavelength determines where in the electromagnetic spectrum it resides. Gamma rays have the shortest wavelength and are able to pass through huge slabs of stone. X-rays have a slightly longer wavelength than gamma rays, but still can go right through the human body (which is why they are used to look for broken bones). Ultraviolet rays are longer still. Visible light includes all the colors of the rainbow. The violet rays have the shortest wavelength, followed by blue, green, yellow, and red. Red light is produced by the longest visible electromagnetic waves. Next comes infrared. Some animals have vision that allows them to see infrared and ultraviolet light in addition to all of the visible light—we call visible light “visible” because humans can see it. After infrared come microwaves. These are the electromagnetic waves that are used for cooking in your microwave oven. The longest electromagnetic waves are radio. The tuners in your radio receivers adjust their antennas to pick up a radio wave of certain frequency. Frequency depends on wavelength of the electromagnetic wave—how many crests pass by in a given time (think train cars).

Main Ideas

Electromagnetic Spectrum

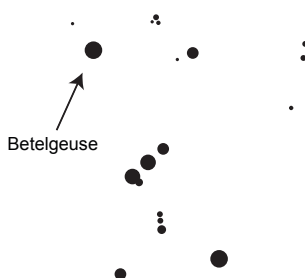
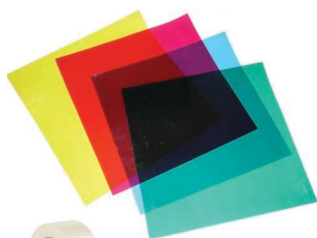
- Wavelength is a measurement used to examine electromagnetic wave and is the length from crest to crest.
- Frequency is a measurement used to examine electromagnetic wave and is determined by counting the number of crests in a specified amount of time (usually a second).
- The energy of the wave, how powerful it is (think radio stations), is measured by its amplitude or the height of the wave.
- In order of decreasing wavelength, these are radio, microwave, infrared, visible light, ultraviolet, x-rays, and gamma rays.
- White light is composed of many colors; a prism can divide white light into its components.
- Color pigments on paper combine in different ways than colored light: if red and green pigments are mixed together, the result is a muddy brown; but if red and green light beams are mixed together, the result is a yellow light beam.



What You Need to Conduct These Activities



Parent Helpers



The Orion Constellation



What You Need

The concepts covered in this section are complex. Parents, teachers, and older students should read all of the **LEARN** pages and try to do the activities suggested on them. Younger students would benefit from having parents or teachers read the **LEARN** pages to them. Make sure to have adequate time set aside for discussions. For maximum benefit, it might be necessary to spend several days to complete this section.

The **DO** pages are appropriate for elementary school children as well as older students. In elementary school, these activities work well when performed in pairs with plenty of adult supervision. A parent can help students organize their materials and their thinking. In higher grades, such supervisory function can be taken up by the students themselves.

Some of the activities in this section require special materials. In particular, the glasses shown on the next page are made with red, green, and blue plastic color filters that can be purchased in your local hobby shop, a photo supply store, or in a gift store as fancy wrapping paper. Of course these are also available for order on Amazon.com (see below).

The materials you will need for each group of students:

- Red, Green, and Blue colored gels
- One Pencil
- Water color markers (pastel markers) or color pencils
- Scissors
- Thumbtacks
- Tape
- Paper
- String
- **Template for Cutting Colored Lens for Paper USE** page
- Parent Helpers to help kids with setting up, clean up, and organization



For color gels, visit <https://www.discountsschoolsupply.com/> and search for “Cellophane Sheets Assorted Colors Pack of 48.” The current price is \$8.64. Or you can buy “Cowboystudio Color Correction Gels - Set of 4 12x12 inches Gels” from Amazon.com for \$6.96.

Hidden Constellation Star Map DO page requires kids not only to color in the stars correctly and view the result through the red filtered glasses, but to actually identify the constellation. This constellation is Orion with the three stars in the middle forming the Orion’s Belt (see left). Your children can use a stellar map on do some research on the Internet. Some might even recognize the pattern from watching the night skies! (This is only true for Northern Hemisphere. Orion is visible in the Southern Hemisphere in summer and in the Northern Hemisphere in winter.)

Do More

This is a difficult section, but some ideas can be easily extended into other areas of the curriculum. In particular, color mixing and creating coded messages with the use of the color glasses are fun and easy to do, and these activities reinforce some of the ideas introduced in this section.