

Nature, Science and Health



Math, Maps and More

Have you ever thought about the connection between math and other areas of your life, like money, space, and time? Discover why people in all walks of life—from chefs to geographers—need to know some math to succeed at their jobs. After completing these activities, the probability is good that you'll further explore the fascinating world of mathematics.

Each interest project contains activities which are organized into four different categories: Skill Builders, Technology, Service Projects, and Career Exploration. By doing these activities, you will gain insights about yourself—your strengths and weaknesses, your likes and dislikes. You will have a range of new experiences, and you will develop valuable skills and expertise in specific areas. *To earn an interest project award, you must complete at least seven activities as follows: two Skill Builders activities; one Technology activity; one service project activity; one Career Exploration activity; Two activities from any category that you choose.*

Skill Builders

1. Use your math skills to create a budget for something that you would like to do or own. You could plan a dream trip or create a savings plan to buy a new computer. Choose tools for the task, such as a calculator, price lists, maps, or computer software. Be sure to list all the costs involved. For example, if you are planning a trip, include all the costs of accommodations, food, and air transportation.
2. Math is a vital part of maintaining a healthy lifestyle. Percentages of fat, protein, starch, and fiber in your daily diet change as your age, health, and activity levels change. Determine the total calorie intake for someone of your age, height, and activity level. Put together a menu for yourself, keeping in mind the need for balanced nutrition.
3. Many indicators of health and fitness require math computations. Do a complete profile of yourself using numbers. For example, use math skills to determine resting, target, and recovery heart rates. Find your pulse and count how many times your heart beats in 10 seconds. Multiply that number by 6. This is your resting heart rate. Be very active for at least 15 minutes. Take your pulse and compare this rate with your resting heart rate. See how long it takes for your pulse to return to your resting heart rate. Other things to check are height, weight, blood pressure, and respiration.

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4. Find out about the statistics used to determine how well a player and team in a particular sport are doing. Local papers carry many statistics on a variety of teams. Select a team or single player to follow for a month. Determine how your team or player did. Try this with a friend who tracks another player or team. See whose team comes out on top.
5. Geographers and cartographers use math skills to make and read maps. Use symbols to create a key for buildings, parks, and other features of interest. Draw your map to scale: for example, 1 inch = 1 mile or 1 cm = 1 km.

Technology

1. Use graphs to illustrate an issue that you feel is important, such as U.S. population shifts, acid rain patterns, or endangered species. Show comparisons, changes over time, and your projections for the future. If possible, use a computer to organize the data to create graphs or charts and then analyze them.
2. Use online resources to search for and explore several math-related Web sites. Find out about at least three women mathematicians, or visit a news group to discover what's being discussed by people interested in math.
3. Learn to play a computer game that uses math skills. Practice during several sessions to improve your skill level. For example, play a flight simulation game on a computer and try to get your plane safely to its destination without running out of fuel.
4. Technology is changing the field of medicine, and math plays an important part in the new advances in equipment and treatment. MRI and CAT scans are diagnostic techniques that can give a visual mapping of the body. Talk with a medical professional who can show you how MRI and CAT scan images are created and used to diagnose and treat diseases.
5. Learn how to read a thermometer, a barometer, a psychrometer, and an anemometer.

Service Projects

1. Create a math activity kit to use with children. You can write a weird and wacky math story or a detective story with math "clues." Or develop a math play focusing on one particular math concept such as factors, fractions, or percentages.
2. Host a Girl Scouts' Game Night. Find math-based games or collect board games from your friends and neighbors. Make sure they are age-appropriate! You may also want to consider creating your own board game. You will need to devise not only the board and the pieces, but also a method of scoring.
3. Volunteer to help collect data that could be used to assist an organization. You could do program surveys for your Girl Scout council or you might do something like assist the National Audubon Society with a bird count or help a local environmental group monitor water quality.

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4. Volunteer to be a treasurer for an organization and keep records in a ledger for a period of at least three months.
5. Help younger girls develop arithmetic skills by using simple computer math games.

Career Exploration

1. With two friends, create a list of eight “traditional” math careers like accountant, engineer, or statistician. Talk with adults and add another 10 careers which, while not math-based, rely heavily on mathematical skills. Then find out which of these 18 fields are “very easy entry” (high school education only is needed) and which are “delayed entry” (graduate school and internships are required).
2. What does math have to do with being a chef or restaurant owner? Find out by creating and running your own restaurant for a day. Select three dishes to feature on your menu and then estimate how many of your customers will wish to order each dish. Calculate how much of each ingredient you will have to purchase to provide each dish for your customers. Compute how much money you will have to spend to purchase these ingredients and what you will need to charge to make a profit. Figure out what profit you made (if any). What changes would you make for the next day? Or interview a restaurant owner, a caterer, or the banquet manager of a hotel. Ask questions such as how forecasts are made, how quantities are controlled, and how inventories are kept.
3. Use online resources, personal interviews, or the resources of a career education center to investigate college programs in mathematics. Determine which programs are best for undergraduate and graduate studies.
4. Imagine that you have your own small business. How would you need to use your math skills? Come up with a product or service you can provide and sell. How much capital is required to order supplies and equipment to start your business? List these start-up costs. Estimate your total number of customers. How much will you charge? Why?
5. For a week, keep a log of all the people you interact with who use math in their work. What types of math skills do they need?

And Beyond

If you like using math in different ways, from mathematical puzzles to brainteasers, try these related interest projects: Games for Life, Home Improvement, Build a Better Future, Inventions and Inquiry, Space Exploration, Creative Cooking, Cookies and Dough, Dollars and Sense or Your Own Business.

This badge can be found in the book *Interest Projects for girls 11 - 17*, page 69. This text has been reproduced with permission from Girl Scouts of the USA—this document may not be copied or reproduced in any way.