Project 1 - LIVING A MINIMUM LIFESTYLE ON MINIMUM WAGE

Introduction: For many of us, our very first job consists of some entry level, minimum wage job. This type of job is a great way to earn spending money, but could we support ourselves making a minimum wage? What does it actually cost to live by ourselves, pay all of our own bills, and buy all of our own food? In this project, you will compute yearly expenses for a person who lives a modest lifestyle. Then you will prepare your own budget.

Procedure:
1. Listed here are the expenses of a person who lives on a tight budget. Note that this person does not have money budgeted for movies, vacations, or going out to eat. Using the data given here, calculate the yearly expenses.

EXPENSES

Water - $12.04/month

Electricity - $20.02/month

Heat - $33/month (year-round average)

Food - $28/week (using coupons)

Household Cleaners, Soap, etc. - $30/month

Laundry - $5.00/week

Gas for Car - $15/week

Auto - (Older Model) $100/year (cost)
$120 per 6 months (insurance)
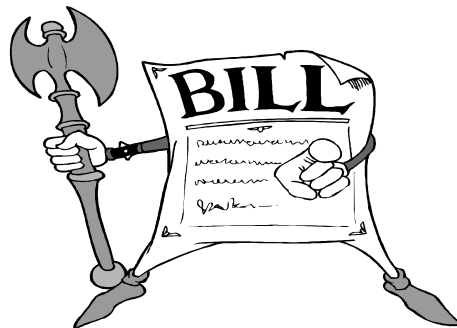$500/year (maintenance)

Medical - $80/month insurance

Clothes, Shoes, etc. - $100/year (second hand)

Furniture, Kitchenware, etc. - $100/year (second hand)

Rent - $290/month (1 bedroom apartment)

CALCULATIONS

YEARLY EXPENSES $_____

2.   Compute the yearly income of a person who has a $4.35/hour job. Use fifty-two 40-hour weeks and take 10% (one tenth) out for taxes.

CALCULATIONS

YEARLY INCOME AFTER TAXES $_____

3.   Is the income calculated in step 1 enough to pay for the expenses calculated in step 2? If it is, then you made a mistake – go back and check your work! How could you modify your lifestyle in order to make ends meet? Give specific calculations to back up your answer.

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CALCULATIONS

4.   Calculate the yearly expenses for a more desirable lifestyle. Do this by adding the following to the expenses in step 1. Note: Only add the items that you personally would like to have. Fill in the table on the following page.

a.   Movies, or going out (per week times 52)
b.   New clothes, furniture and other household items (per year)
c.   Eating out (per week times 52)
d.   Eating foods like steak, snack foods and other nonessentials (per week times 52)
e.   Trips out of town (as, food, lodging, etc., . . .) (per year)
f.   New cars (12 monthly payments + $170/year extra insurance)
g.   Sports and hobbies
h.   Other

BUDGET ITEM	YEARLY EXPENSE
TOTAL COST	

5.   Approximately what yearly income would you need to pay for your personal lifestyle calculated in step 4? Keep in mind that about 20% or 1/5 of your yearly income will be taken out for taxes.

Example: If you need $25,000 per year, then your yearly income must be about $31,000 since 1/5 of 31,000 = 6,200 and 31,000 - 6,200 = 24,800.

CALCULATIONS

YEARLY INCOME $_____

6.   Name three types of jobs that interest you. Make sure that these jobs pay wages that support
        the type of lifestyle that you would like to have. Also, list the before tax income of each job.

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7.   Based on your findings describe what it would be like to drop out of school and support
        yourself with a minimum wage job.

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Project 2 - DIETARY PLANNING TO REDUCE FAT

Introduction: People are always trying to lose weight. There are probably dozens of different methods of weight loss. Some extreme methods involve fad diets while others involve complicated exercise equipment. A successful method of weight loss combines exercise and diet management. Research, in recent years, indicates that a low fat diet works best. In this project, you will look at many different foods and their fat contents. You will also recommend a menu for breakfast, lunch, and dinner for a single day.

Procedure:
1.   Pick four of your favorite processed snack items that contain significant fat or significant amounts of sugar and fat (e.g., cookies, chips, candy bars, etc.). Pick four of your favorite food items from the following categories: fruits, vegetables, breads/cereals/rice/pasta items, milk/yogurt/cheese items, and meat/poultry/non-meat substitutes (e.g., nuts, lentils, etc.). Also pick four of your favorite entrees which contain several food categories (e.g., lasagna, casseroles, etc.).   You should have picked a total of 28 different food items and entrees. Write the names of these items below.

4 SNACK ITEMS_____

4 FRUITS_____

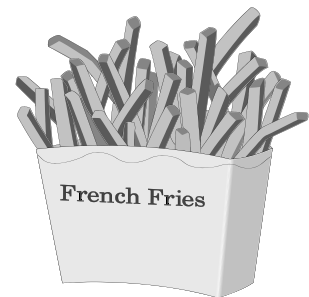**4 VEGETABLES**_____

4 BREADS/CEREALS/PASTA_____

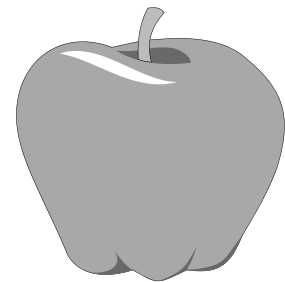**4 MILK/YOGURT/CHEESE**_____

4 MEAT/PROTEIN_____

4 ENTREES_____

2.   For each of the food items picked, you must find the **grams of fat per serving**. For the snack items, the fat gram information will be given on the package. For other food items, the fat gram information is available in most cook books, or in most dietary planning books found in the library.

3.   Fill in the seven tables on the following pages. There is one table for each of the seven categories listed in step 1. Write in the name of each food, and list the fat grams per serving.
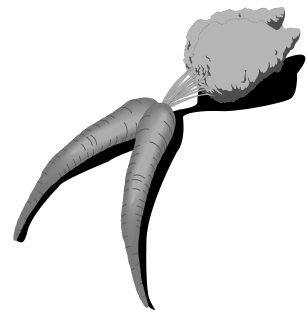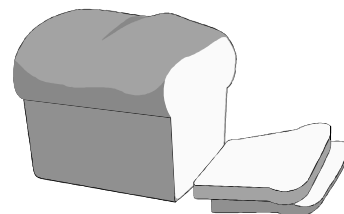
NAMES OF SNACK ITEMS	GRAMS OF FAT

NAMES OF FRUITS	GRAMS OF FAT

NAMES OF VEGETABLES	GRAMS OF FAT

French Fries

NAMES OF BREADS/CEREALS/PASTA	GRAMS OF FAT

NAMES OF MILK/YOGURT/CHEESE ITEMS	GRAMS OF FAT

NAMES OF MEAT/PROTEIN ITEMS	GRAMS OF FAT

NAMES OF ENTREES	FOOD GROUPS REPRESENTED	GRAMS OF FAT

MILK

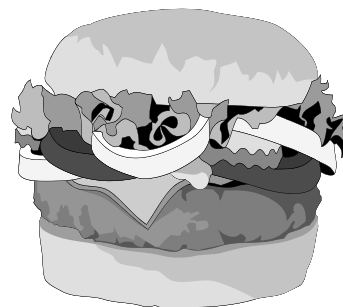LASAGNA

4.   Design a single day's menu including breakfast, lunch, and dinner. Minimize the fat content and use the following guidelines:

    a.   Each day you should eat 6 to 11 servings from the bread, cereal, rice and pasta category.

    b.   Each day you should eat 2 to 4 servings from the fruit group.

    c.   Each day you should eat 3 to 5 servings from the vegetable group.

    d.   Each day you should eat 2 to 3 servings from the milk, yogurt, and cheese group.

    e.   Each day you should eat 2 to 3 servings from the meat, poultry, or meat substitute group.

    f.   Each day you should eat a minimum of snack foods containing fats, or fats and sugar.

    Record your menu on the following tables.

BREAKFAST	
FOOD ITEMS	GRAMS OF FAT
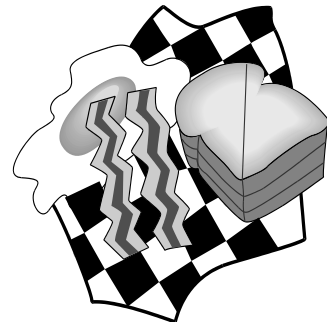
LUNCH	
FOOD ITEMS	**GRAMS OF FAT**

DINNER	
FOOD ITEMS	**GRAMS OF FAT**
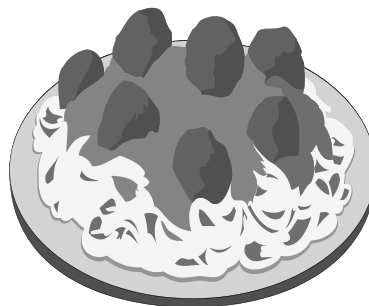
5.   Using your menu, calculate the total grams of fat for the day.

TOTAL GRAMS OF FAT_____

6.   Based on this investigation, what three suggestions would you give to someone who is trying to lose weight through dietary planning?

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7.   Describe three ways in which this investigation could have been improved?

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Project 3 - INSTANT WINNER LOTTERY OR LONG TERM LOSER?

Introduction: Many people play instant-win lottery games with the hopes of winning large prizes and occasionally, you hear of someone actually winning $10,000 or $20,000. Considering that these instant-win tickets usually cost only $1, it seems that if a person played these games on a regular basis, then sure fortune would result. Or would it? In this investigation, you will use some fairly simple arithmetic to find out what one would expect to win by playing the instant-win lottery tickets. You will calculate the expected winnings of a given instant-win lottery ticket. This expected amount is the average amount you would win per ticket in the long run.

Procedure:
1. You must select three different types of instant-win lottery tickets and obtain the information booklet for each ticket. The information booklet will have the odds of winning each type of prize. You can easily obtain these information booklets at any convenience store where tickets are sold. **Remember, the odds of winning each type of prize must be given.** Note: When most instant-win tickets list the odds, they are actually listing the probabilities. In any case, the use of odds will yield a close estimate of the expected winnings.

2. Calculate the expected winnings for each of the three tickets. The expected winnings are calculated in the following way:

    a. Multiply the probability times the prize amount for each prize listed.

    b. Add all of these products together.

> **Example:** A ticket has the following prizes: $50,000 with a probability of 1:1,000,000 , $10,000 with a probability of 1:100,000 , $10 with a probability of 1:80, and $1 with a probability of 1:3.
>
> The expected winnings are (50,000 X 1/1,000,000) + (10,000 X 1/100,000) + (10 X 1/80) + (2 X 1/3)
>
> = (50,000 X 0.000001) + (10,000 X 0.00001) + (10 X 0.0125) + (2 X 0.333)
>
> = 0.05 + 0.10 + 0.125 + 0.33 = $0.605 = 60½ cents.
>
> If this ticket were purchased for $1.00, then the expected winnings would be 60½ cents, and you would lose 39½ cents per ticket in the long run.
>
> Note: The odds were converted to a fraction. Then, the fraction was converted to a decimal before calculations were done.

Calculations for ticket #1

Calculations for ticket #2

Calculations for ticket #3

3. Fill in the table listing the price of each instant-win ticket, the expected winnings for each ticket, and the expected money lost per ticket.

	TICKET #1	TICKET #2	TICKET #3
PRICE			
WINNINGS			
MONEY LOST			

4. Based on your findings, how much money would a person probably lose by buying $10,000 worth of instant-win tickets?

CALCULATIONS

TOTAL AMOUNT LOST $_____

5. State three reasons why you think some people invest large amounts of money in instant-win tickets.

6. If you had to conduct a study to determine how much money people lose by gambling at a Las Vegas casino, what type of data would you obtain?

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Project 4 - WATTS UP? - THE COST OF LEAVING A LIGHT ON ALL NIGHT

Introduction: Everyone knows that leaving a light on all night will increase your electric bill. But by how much will it increase your electric bill? Can we calculate the increase exactly? In this project you will learn how to calculate the costs of operating nearly every electrical appliance in your home. You will calculate the kilowatt-hours, and use the rate charged by your local electric company to calculate the dollar amounts required to operate electric lights and selected appliances.

Procedure:
1.   In your home, take an inventory of all the electrical lights and appliances used in an average 24-hour day. This can be done by filling in the following inventory list.

   __60W LIGHT BULBS USED FOR A COMBINED TOTAL OF __HOURS

   __75W LIGHT BULBS USED FOR A COMBINED TOTAL OF __HOURS

   __100W LIGHT BULBS USED FOR A COMBINED TOTAL OF __HOURS

   __150W LIGHT BULBS USED FOR A COMBINED TOTAL OF __HOURS

   OTHER WATTAGES OF LIGHT BULBS __WATTS __HOURS

   OTHER WATTAGES OF LIGHT BULBS __WATTS __HOURS

> **Example: Four 100W light bulbs are used for 8 hours each. The combined total of hours is 4 X 8 = 32 hours. Also, three 40W bulbs are used for 6 hours each. The combined total of hours are 3 X 6 = 18 hours. You would complete the inventory in the following way:**
>
> **4 100W LIGHT BULBS USED FOR A COMBINED TOTAL OF 32 HOURS**
>
> **OTHER WATTAGES OF LIGHT BULBS 40 WATTS 18 HOURS**

2.   Select either an air conditioner or an electric space heater, and find out how many watts this appliance uses, and how many hours this appliance is used per day. If you do not have a space heater or an air conditioner, go to an appliance store and write down the watts used by a space heater or an air conditioner of your choice. Estimate how many hours you would use this appliance in a 24-hour day.

   WATTS USED____   HOURS USED PER DAY___

3.   The electric company calculates your electric bill based on the number of kilowatt-hours used. To calculate the kilowatt-hours, first calculate the total watt-hours. To do this, multiply the watt rating by the total number of hours the light or appliance is used in a 24-hour day.

> **Example: The 75 watt bulbs are used for a combined total of 30 hours a day. 30 hours X 75 watts = 2,250 watt-hours.**

Calculate the watt-hours for each type of light bulb. Also, calculate the watt-hours for the space heater or air conditioner. Add all of the watt-hours together.

CALCULATIONS
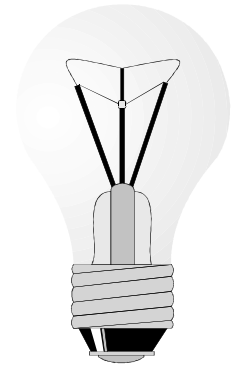
WATT-HOURS FOR AIR CONDITIONER OR HEATER _____

WATT-HOURS FOR 60W BULBS_____

WATT-HOURS FOR 75W BULBS_____

WATT-HOURS FOR 100W BULBS_____

WATT-HOURS (OTHER BULBS)_____

WATT-HOURS (OTHER BULBS)_____

WATT-HOURS (OTHER BULBS)_____

TOTAL WATT-HOURS PER DAY_____

4.   Each kilowatt-hour = 1,000 watt-hours. Convert your total number of watt-hours into kilowatt-hours by dividing by 1,000. Record this figure.

TOTAL KILOWATT-HOURS PER DAY_____

5. Find out how much your electric company charges for each kilowatt-hour. This information should be included with your electric bill. Otherwise, it is available by calling the power company. Generally, rates vary from 4 to 12 cents for each kilowatt-hour.

    AMOUNT CHARGED PER KILOWATT-HOUR_____

6. Calculate how much it costs to run your lights and your air conditioner or space heater each day. Also, calculate the monthly cost.

    CALCULATIONS

    DAILY COST $_____

    MONTHLY COST $_____

7. Based on your experience with this project describe three ways in which a person could significantly reduce their electric bill.

Project 5 - LET'S MAKE A DEAL USING A PROBABILITY SIMULATION

Introduction: In the popular game show, "Let's Make a Deal", contestants are sometimes given the choice of three curtains, a valuable prize behind one of the curtains and undesirable prizes behind the remaining two curtains. Often, after a curtain is selected, a different curtain is opened to reveal a somewhat undesirable prize. The contestant is then given the opportunity to switch curtains. Should the contestant switch to the other curtain? Or, does it even make a difference? You will be able to answer these questions after completing this project. The answers may surprise you!

Procedure:
1. You will need someone to assist you with this simulation. Find someone who will spend approximately 45 minutes to help you with this project.

2. In this project, you will simulate the game show described above by using three identical cardboard squares with the numbers **1**, **2** and **3** written on the backs of the cards. These cards will function as the "curtains" in this simulated game show. Cut out a piece of paper that is smaller than the cardboard squares and write the word "prize" on it. This will function as the "grand prize" in this simulation.

3. With the person who has agreed to help, decide which of you will play the role of "game show host" and which of you will be the "contestant". The game show host should place the small piece of paper labeled "prize" under one of the cards. Make sure that the contestant does not see where the "prize" card has been placed. The contestant will choose one of the cards. Then, the host lifts up one of the cards with no prize under it, and allows the contestant to switch their choice. In this part of this simulation, the contestant should **always switch** choices. Repeat this game 30 times, and record how many times the contestant wins the "prize".

> **Example: The host places the prize under card #2. The contestant chooses card #1. The host lifts up card #3 to show that there is no prize. In this part of this simulation, the contestant switches to card #2 and wins.**

    NUMBER OF WINS_____   NUMBER OF LOSSES_____

4. Repeat step 3, except this time, the contestant should **never switch** choices after one of the cards is turned up. Repeat this simulation 30 times and record how many times the contestant wins the prize.

    NUMBER OF WINS_____   NUMBER OF LOSSES_____

5.   Calculate the percentage of wins when you switched choices each time. Then, calculate the percentage of when you never switched choices.

> **Example: You win 14 out of 30 games. The percentage of wins is calculated as   14 ÷ 30 ≈ .467   = 46.7%**

CALCULATIONS

_____% PERCENTAGE OF WINS (SWITCHED EACH TIME)

_____% PERCENTAGE OF WINS (NEVER SWITCHED)

5.   Based on your results in this simulation, does it matter if you switch choices after one card is turned up?   Explain why switching cards does, or does not make a difference.

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6. Devise a game similar to the one you just simulated, and describe a method to simulate the game you have devised.

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Project 6 - FROM PERCENT TO PROSPERITY

Introduction: Many people depend on percentages for their income. When a salesperson receives no fixed salary, but receives a percentage of the total dollar value of their sales, they are said to work on commission. Thus, a salesperson that receives a 7% commission, will receive 7 cents for every dollars worth of goods that they sell. The advantage of working on commission is a potential for a high income if sales are good. Of course, if few sales are made, the income is poor. Some examples of commission work are real estate sales, car sales, insurance sales, stereo equipment sales, and investments, just to name a few. In this project, you will investigate how much money is made by different people working on commission.

Procedure:

1. Find three different people that work on a commission-only basis. These people can work in real estate, auto sales, or any type of job that pays only on commission. These three people should be in different areas of sales.

   FIRST PERSON'S OCCUPATION_____

   SECOND PERSON'S OCCUPATION_____

   THIRD PERSON'S OCCUPATION_____

2) For each person, obtain the following data:

   a. What is the rate of commission?

   FIRST PERSON'S RATE OF COMMISSION_____%

   SECOND PERSON'S RATE OF COMMISSION_____%

   THIRD PERSON'S RATE OF COMMISSION_____%

   b. Ask each person what the potential maximum dollar amount of sales is for one year?

   FIRST PERSON'S POTENTIAL MAXIMUM YEARLY SALES $_____

   SECOND PERSON'S POTENTIAL MAXIMUM YEARLY SALES $_____

   THIRD PERSON'S POTENTIAL MAXIMUM YEARLY SALES $_____

c. In the person's particular area of sales, what is an estimate of the yearly sales for an average salesperson?

AVERAGE YEARLY SALES IN FIRST PERSON'S AREA $_____

AVERAGE YEARLY SALES IN SECOND PERSON'S AREA $_____

AVERAGE YEARLY SALES IN THIRD PERSON'S AREA $_____

3)   On your own, compute the following for each salesperson:

a. What is the potential yearly income one could make?

Example: If the potential yearly sales are $500,000 and the rate of commission is 6%, then the potential yearly income is 6% of $500,000 = .06 × 500,000 = $30,000.

CALCULATIONS

FIRST PERSON'S POTENTIAL YEARLY INCOME $_____

SECOND PERSON'S POTENTIAL YEARLY INCOME $_____

THIRD PERSON'S POTENTIAL YEARLY INCOME $_____

b. What is the average yearly income?

CALCULATIONS

FIRST PERSON'S AVERAGE YEARLY INCOME $_____

SECOND PERSON'S AVERAGE YEARLY INCOME $_____

THIRD PERSON'S AVERAGE YEARLY INCOME $_____

4.   Make up two bar graphs, one plotting the potential maximum yearly incomes, and one plotting the average yearly incomes. The graphs should be similar in format to the one given here.

COMPARISON OF INCOMES
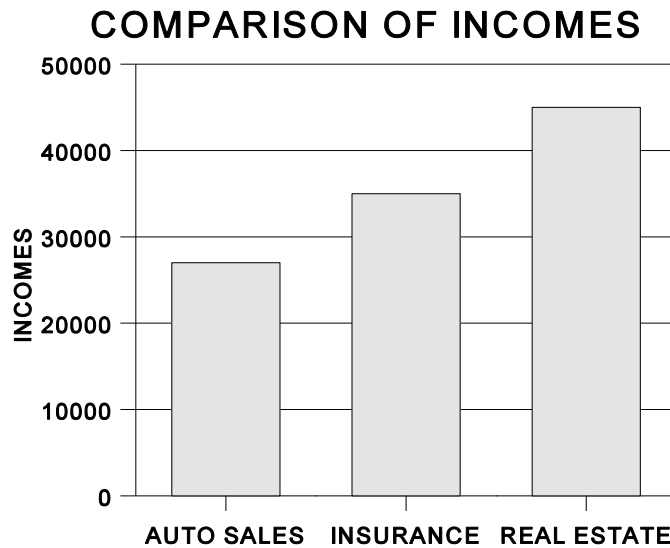
BAR GRAPHS

5. Based on your results, which of the three types of sales jobs would you like to have? Support your answer.

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6. If you were to conduct a survey of all types of salespeople who work on commission, what three questions would you ask?

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Project 7 - HOW LONG DOES IT TAKE TO DRIVE TO ALASKA?

Introduction: Many of us have, at one time or another, considered visiting Alaska. It is clear that if one were to drive to any part of Alaska, it would require a lot of driving time. How much time? In this project, you will plan a trip to Alaska. You will plan a route, calculate the total highway miles, the total driving time, and the cost of the trip.

Procedure:
1.   You must first plan a route. In order to do this, you must obtain a North American road atlas. If you do not own a North American road atlas, your library will have one. Starting from your home town, pick a highway route to the city, or to the area of Alaska that you wish to visit.

2.   Using the route that you have selected, you will need to calculate the total number of highway miles. To do this, run a long piece of string along your route, starting at your home town. Tape the end of the string down at the map location of your home town, and carefully cover the travel route with the string. Place additional pieces of tape over the string every few hundred miles and curve the string when the highway takes a major turn. After you run the string all the way to Alaska, cut off any string that extends past your destination. Then, calculate the distance by using the distance scale on the page of the map containing your route.

> **Example: You run a string from San Francisco, California to Anchorage, Alaska along the highway route you have chosen. The total length of the string is 20 inches. The scale on the map indicates that 1 inch on the map is equal to 200 miles of actual distance. The total distance is calculated as 20 X 200 = 4000 miles.**
>
> **Note: Because your map may not include the entire area from your home town to Alaska, you may have to calculate this distance in two parts. You may have to do one calculation of the distance to the Canadian border, and a second calculation from the Canadian border to your destination in Alaska.**

CALCULATIONS

DISTANCE CALCULATED_____
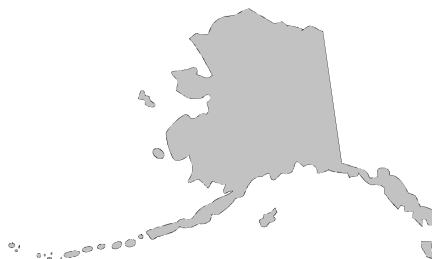
3.   Using the calculated distance, figure out how long it would take to drive to Alaska at an average speed of 55 MPH. How many days would it take you to drive to Alaska if you took time to rest?

> **Example: If the calculated distance was 2,000 miles, the hours of driving are calculated by dividing 2,000 miles by 55 MPH. 2,000 ÷ 55 = 36.36 hours.**
>
> **36.36 hours ÷ 24 hours per day = 36.36 ÷ 24 = 1.51 days**
>
> **A person can drive about 12 hours per day, and take 12 hours of each day for rest time. Driving about 12 hours per day for 3 days would allow a person to cover the 2000 miles. Of course, this would require two overnight stops.**

CALCULATIONS

HOURS REQUIRED TO DRIVE_____

24 HOUR DAYS REQUIRED TO DRIVE_____

DRIVING DAYS REQUIRED (REST TIME INCLUDED)_____

4.   How many gallons of gas would be required if your car could travel 25 miles per gallon? At $1.20 per gallon, how much would it cost to drive to Alaska? Estimate the costs of food, and overnight lodging for the time spent driving to Alaska.

CALCULATIONS

GALLONS OF GAS_____

COST OF GAS $_____

ESTIMATED COST OF FOOD AND LODGING $_____

5. Add the cost of gas, and the estimated cost of food and lodging together to obtain the one-way cost of driving to Alaska. Now double this amount to obtain the round-trip cost.

CALCULATIONS

ONE-WAY COST OF DRIVING TO ALASKA $_____

ROUND-TRIP COST OF DRIVING TO ALASKA $_____

6. In addition to the cost of the round-trip to Alaska, describe at least three other things that you would plan in advance for this trip.

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Project 8 - SMALL CREEK - LOTS OF WATER!

Introduction: Many of us have waded across our favorite creek, or jumped from rock to rock in order to cross a small stream. But we do not fully realize how much water moves through a small stream or creek in a day. In this project, you will calculate the approximate number of gallons of water that flow through a small creek in a single day. This number may surprise you!

Procedure:
1. Find a creek or small stream that is, on the average, no more than shin deep. Locate a region of the stream that has a fairly uniform depth with no rocks above the surface. This region of the stream should have a depth of about 5 to 10 inches.

2. In the region of the stream selected, measure the width of the stream and the average depth. Record these measurements. You will probably have to walk out in the stream to get these measurements. You should be able to keep dry by wearing a pair of high topped boots. **Wear a personal flotation device when wading out in the stream. Do not take these measurements in a stream that is deeper than two feet, or in a stream that is in a high water or flooded condition.**

   STREAM WIDTH_____

   STREAM DEPTH_____

3. Measure the speed of the current in the following way:

   a. Place a marker on the bank in the region where you took your measurements. (A white handkerchief would make a good marker.) Measure 10 feet downstream from the first marker, and place a second marker on the bank.

   b. Drop a floating object such as a small leaf by the first marker and record the number of seconds it takes for the small object to reach the second marker 10 feet away. Divide 10 by the number of seconds you recorded. This is your speed in feet per second. Record this speed.

   > **Example: You drop a small floating object, and it takes 6 seconds for the object to travel 10 feet. The speed of the stream is 10 ÷ 6 = 1.67 feet per second.**

   TIME (SECONDS) FOR OBJECT TO TRAVEL 10 FEET_____

   SPEED OF STREAM (10 ÷ TIME)_____**FEET PER SECOND**

4.   Calculate the volume of water moving through the stream each second in the following way:

   a.   Convert your depth and width measurements to feet if they were taken in inches. To do this, divide the measurements taken in inches by 12.

CALCULATIONS

WIDTH IN FEET_____

DEPTH IN FEET_____

   b.   Multiply the depth times the width times the speed where the depth and the width are in feet and the speed is in feet per second. This product is your volume in cubic feet per second. Record this volume rate.

> **Example: The average depth of the stream is 4 inches, the width of the stream is 5 feet, and the speed of the stream is 2.2 feet per second. The depth of 4 inches is equal to 4 ÷ 12 = 0.33 feet, the width of the stream is equal to 5 feet. Depth X width X speed = 0.33 X 5 X 2.2 = 3.63 cubic feet per second.**

CALCULATIONS

DEPTH ✕ WIDTH ✕ SPEED = _____CUBIC FEET PER SECOND

5.   Multiply your obtained volume rate by 7.481 . This product is the volume rate in gallons per second. Record this volume rate.

CALCULATIONS

GALLONS PER SECOND_____

6. You have calculated how many gallons of water flow through the stream each second. Using the fact that there are 86,400 seconds per day, how many gallons of water flow through the stream each day?

<p align="center">CALCULATIONS</p>

GALLONS PER DAY_____

7. Describe what would happen if the small stream you just studied were to be dammed up.

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Project 9 - SELECTION OF THE BEST PRICED CAR

Introduction: People are always trying to get the best car for their money. Some people always buy new cars, and make monthly payments. The people who buy newer cars sometimes pay as much as $25,000. Some buy older cars which cost as little as $100. The people who buy the older cars tend to pay more for repairs and less for insurance. You will try to determine what type of car is the best value.

Procedure:
1. You must interview one of each of these three types of car owners:

    a. A person who has, within the last two years, purchased a car that is three years old or newer.

    b. A person who has, within the last two years, purchased a car that is from five to nine years old.

    c. A person who has, within the last two years, purchased a car that is ten or more years old.

2. Obtain the following data from each of these three people:

    a. The price paid for the car, and the total years of service the owner feels they could get out of the car if they drive it until it is undrivable. Calculate the purchase cost per year by dividing the price by the total years of service. Enter this data in the tables provided.

    > **Example: The price of the car is $13,000. The owner feels that the car will provide about 10 years of service. The purchase cost per year is $13,000 ÷ 10 = $1,300.**

NEWEST CAR	
PRICE	$_____
TOTAL YEARS OF SERVICE	____YEARS
PURCHASE COST PER YEAR	$_____

5 TO 9 YEAR OLD CAR	
PRICE	$_____
TOTAL YEARS OF SERVICE	____YEARS
PURCHASE COST PER YEAR	$_____
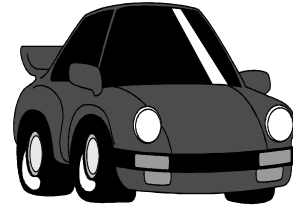
OLDEST CAR	
PRICE	$_____
TOTAL YEARS OF SERVICE	____YEARS
PURCHASE COST PER YEAR	$_____

b. Obtain an estimate of the total cost of repairs and maintenance for this last year, and enter this data in the table given.

TOTAL COST OF REPAIRS AND MAINTENANCE PER YEAR	
NEWEST CAR	$_____
5 TO 9 YEAR OLD CAR	$_____
OLDEST CAR	$_____

c. Obtain the cost of insurance per year for these cars, and enter this data in the table given.

TOTAL COST OF INSURANCE PER YEAR	
NEWEST CAR	$_____
5 TO 9 YEAR OLD CAR	$_____
OLDEST CAR	$_____

d.   Obtain the gas mileage in miles per gallon. Also, calculate the number of gallons of gas used for 12,000 miles of driving per year. Then, calculate the cost of this gas by using a price of $1.25 per gallon. Enter this data into the tables given.

> **Example: A car obtains a gas mileage of 21 MPG. For 12,000 miles driven, the car uses 12,000 ÷ 21 = 571 gallons of gas. At $1.25, the cost of this gas is 571X1.25 = $714, rounded to the nearest whole number.**

CALCULATIONS

NEWEST CAR	
MILES PER GALLON	_____MPG
GALLONS OF GAS PER 12,000 MILES	_____GALLONS
COST OF GAS	$_____

CALCULATIONS

5 TO 9 YEAR OLD CAR	
MILES PER GALLON	_____MPG
GALLONS OF GAS PER 12,000 MILES	_____GALLONS
COST OF GAS	$_____

CALCULATIONS

OLDEST CAR	
MILES PER GALLON	_____MPG
GALLONS OF GAS PER 12,000 MILES	_____GALLONS
COST OF GAS	$_____

3.   Fill in the table below with the costs calculated in step 2.

	PURCHASE COST PER YEAR	MAINTENANCE AND REPAIRS PER YEAR	COST OF INSURANCE PER YEAR	COST OF GAS PER YEAR	TOTAL COSTS PER YEAR
NEWEST CAR					
5 TO 9 YEAR OLD CAR					
OLDEST CAR					

4.   Based on your results, which is the least expensive to own: a car that is more than ten years old, a car that is from five to nine years old, or a car that is three or fewer years old?

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5.   If you were buying a car, how old of a car would you buy? Give three reasons to support

your answer. Note: You do not have to pick the "cheapest" car. Simply support **your** choice with three reasons.

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6.   What three additional questions could you ask each car owner to better determine the cost of owning and operating their car?

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Project 10 - HOW TO COUNT ALL THE NEWSPAPERS IN TOWN

Introduction: How do polling agencies calculate percentages of Americans that agree or disagree on a given issue? Polling agencies certainly do not poll every person in this country in order to obtain their results. Rather, a representative sample of Americans are polled, and that polling data can be used to make a prediction about the general population. In this project, you will poll citizens from a city of at least 1,000 people. From your obtained data, you will predict how many Sunday papers are sold in that city.

Procedure:
1. You will need to choose a city which has a population of at least 1,000 people. This will be where you conduct your survey.

2. Select 15 people to interview. These 15 people should make up a fairly representative sample of the cities population. Some should be older, some should be younger, and some should be middle aged. Also, pick people of lower, middle, and upper incomes.

3. Select a Sunday paper that many people in this city read. Interview 15 people, and record how many of them receive the Sunday paper that you selected. Record how many people out of the 15 interviewed receive this Sunday paper.

   **NUMBER OF PEOPLE RECEIVING THE SUNDAY PAPER_____**

4. Divide the number of people receiving the Sunday paper by 15, and write this number as a decimal. Now, convert this decimal into a percent, and record this percent below.

    CALCULATIONS

    PERCENT OF PEOPLE RECEIVING THE SUNDAY PAPER_____

5. Multiply the percent you obtained by the total population of the city. This is your estimate of the total number of Sunday papers sold in the city.

    CALCULATIONS
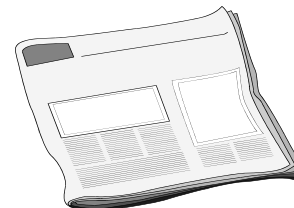
    ESTIMATE OF THE TOTAL NUMBER OF SUNDAY PAPERS SOLD_____

6. Now call the local newspaper, ask for the circulation department, and politely request the actual number of Sunday paper subscriptions in the city you surveyed. They do not have to give you this information, but, if you explain that this is part of a school project, they will probably be helpful.

ACTUAL NUMBER OF SUNDAY PAPERS SOLD_____

7. If it was possible to compare your estimate with the actual number, how close was your estimate?

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8. Describe three ways in which you would improve this survey, and obtain a more accurate estimate?

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9. Describe three ways in which the survey and estimation technique you used would be helpful to a business or a polling agency?

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