

Project 11 - WHEN DO PROFESSIONAL ATHLETES BURNOUT?

Introduction: Many people who are sports fans have a favorite team, and a favorite athlete. Our favorite athlete usually has extraordinary athletic ability, but even these outstanding athletes eventually retire. Time takes its toll on all of us, even our favorite athletes. In this project you will find the average age at which your favorite athlete's performance started to decline.

Procedure:

1. Think of four of your favorite athletes who have retired.
2. Pick a statistic for each of the athletes. This should relate to their strong area. For example, if you picked a baseball player, you should pick a statistic like home runs if your player is famous for hitting home runs.
3. Go to the library and find a comprehensive sports encyclopedia that lists year by year statistics for each athlete. You will need this information.
4. For each athlete, fill in the tables provided with the statistics for each year of the athlete's career. Calculate each athlete's age in their first year, and then fill in the athlete's age for each year of their career.

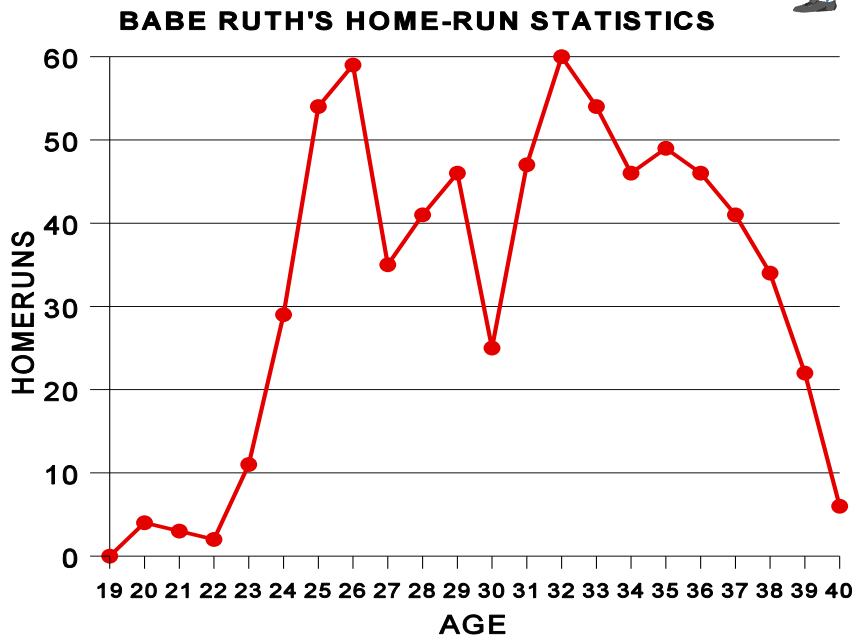
Example: Babe Ruth played his first baseball game in 1914. He was born on Feb. 6, 1895, so he was 19 years old in the first year of his career.

The statistics listed here for Babe Ruth are home runs per season.

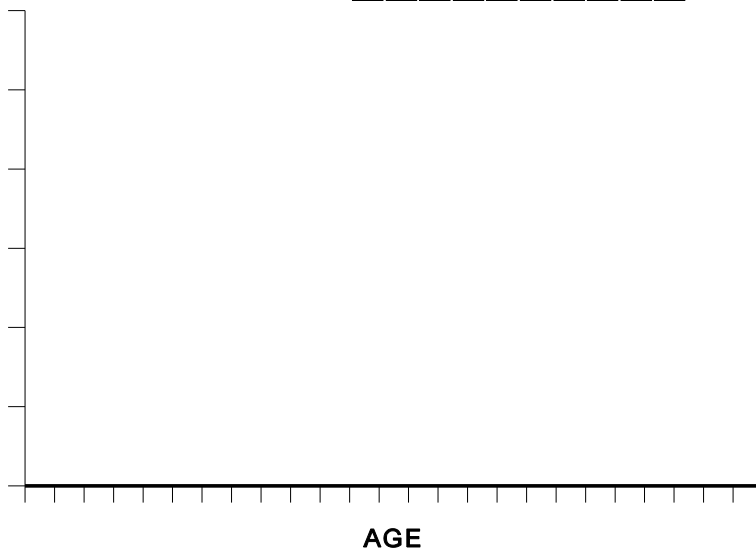
| AGE | HOME RUNS | | AGE | HOME RUNS | | AGE | HOME RUNS |
|-----|-----------|--|-----|-----------|--|-----|-----------|
| 19 | 0 | | 28 | 41 | | 37 | 41 |
| 20 | 4 | | 29 | 46 | | 38 | 34 |
| 21 | 3 | | 30 | 25 | | 39 | 22 |
| 22 | 2 | | 31 | 47 | | 40 | 6 |
| 23 | 11 | | 32 | 60 | | | |
| 24 | 29 | | 33 | 54 | | | |
| 25 | 54 | | 34 | 46 | | | |
| 26 | 59 | | 35 | 49 | | | |
| 27 | 35 | | 36 | 46 | | | |

| ATHLETE'S NAME | | ATHLETE'S NAME | | ATHLETE'S NAME | | ATHLETE'S NAME | |
|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|
| AGE | STATISTIC | AGE | STATISTIC | AGE | STATISTIC | AGE | STATISTIC |
| | | | | | | | |

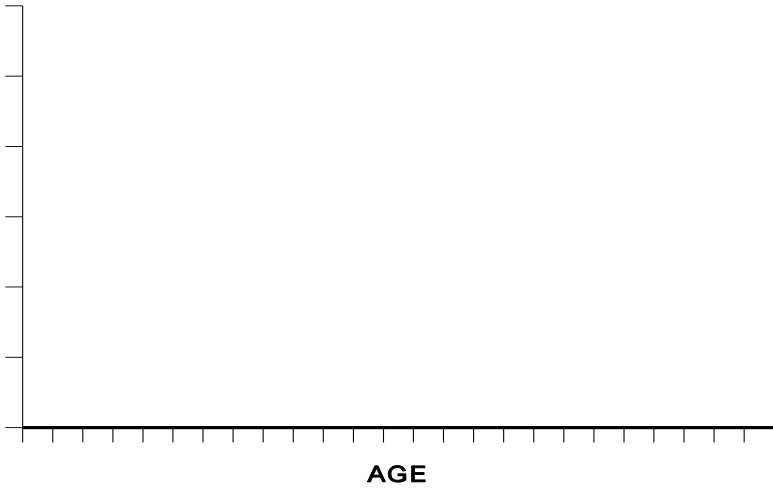
5. Make four graphs, one for each player. The graphs should look like the following:



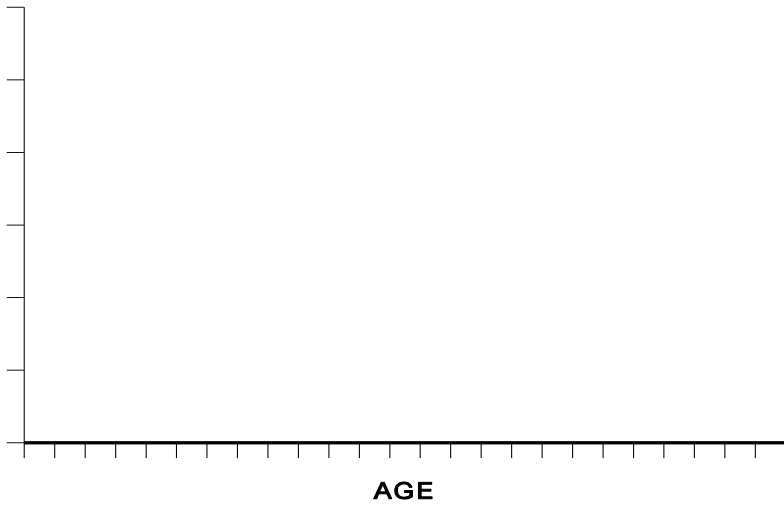
ATHLETE _____



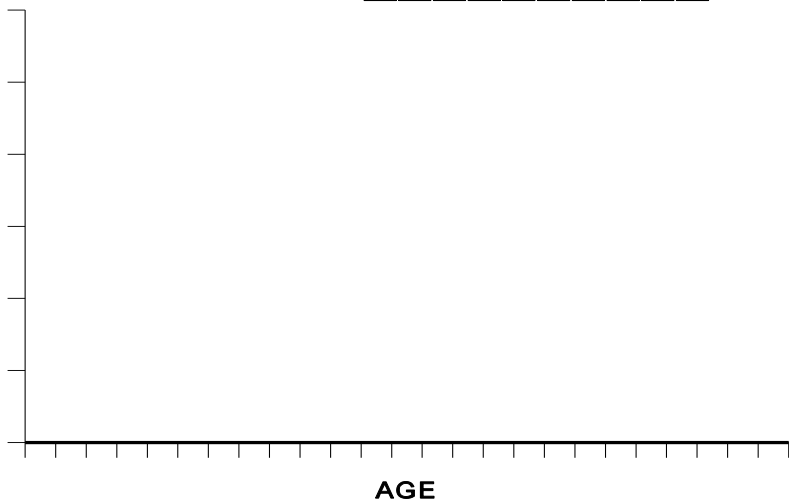
ATHLETE _____



ATHLETE _____



ATHLETE _____



3. Convert each unit of measure to the largest possible unit. Fill in the table provided.

Example: In the previous example, 56.25 teaspoons of salt were required. Since 3 teaspoons = 1 tablespoon, $56.25 \div 3 = 18.75$ tablespoons. Since 16 tablespoons = 1 cup, $18.75 \div 16 = 1.18$ cups, which is slightly less than 1.25 or 1 $\frac{1}{4}$ cups.

Use the following conversion factors:

DRY MEASURE

3 teaspoons = 1 tablespoon

8 tablespoons = $\frac{1}{2}$ cup

16 tablespoons = 1 cup

LIQUID MEASURE

8 ounces = 1 cup

16 ounces = 1 pint

2 cups = 1 pint

2 pints = 1 quart

4 quarts = 1 gallon

WEIGHT

16 ounces = 1 pound

| INGREDIENT | AMOUNT USED FOR RECIPE TO FEED 150 PEOPLE |
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4. Calculate the approximate cost of the ingredients for this spaghetti dinner by doing the following:
- a. Write each ingredient amount in terms of the amounts you would purchase. You will have to estimate for some of the ingredients. Fill in these amounts in the table given on the following page.

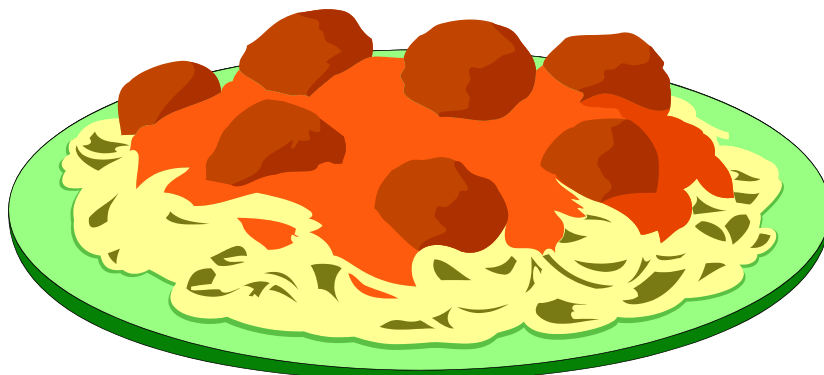
Example: 25 tablespoons of oregano is equal to about 5 containers of oregano.

- b. Calculate the cost of each ingredient. You may have to make a trip to the grocery store to obtain the prices. Write these costs in the table given on the following page.

Example: 5 containers of oregano at \$2.55 per container results in a cost of $5 \times \$2.55 = \12.75 .

- c. Add up all the costs.

CALCULATIONS



| CALCULATION OF INGREDIENT COSTS | | |
|---------------------------------|--------------------------------------|-------------------------------|
| NAME OF INGREDIENT | AMOUNT OF INGREDIENT TO PURCHASE | TOTAL COST OF THIS INGREDIENT |
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| | TOTAL COST OF ALL INGREDIENTS | |

5. Calculate the cost per person by dividing your total cost by 150.

CALCULATIONS

COST PER PERSON \$ _____



Project 13 - THE PLUSES AND MINUSES OF OWNING A SMALL BUSINESS

Introduction: Have you ever wondered how much money a typical small business owner makes after deducting expenses? The net profit of a business is determined by three factors: the sales of the product or services, the cost of producing the product or services, and the overhead costs. In this project, you will interview a small business owner in order to calculate their daily profit.

Procedure:

1. Find a small business owner that you can interview. This should be a business with five or fewer employees.
2. From this small business owner, obtain the following:
 - a. The average daily sales in dollars.

AVERAGE DAILY SALES \$_____

- b. The cost of producing the goods or services sold in an average day. This is the cost of producing each item multiplied by the average number of items sold in a day. This does not include overhead costs.

CALCULATIONS

DAILY COST OF PRODUCING GOODS OR SERVICES \$_____

- c. The overhead costs per day. These are expenses that occur whether or not any products or services are sold. These include the following categories:

- Rent (per day)
- Heat, water, electricity and other utilities (per day)
- Salaries (per day)
- Insurance (per day)
- Office equipment or other equipment (per day)
- Other (per day)

Obtain approximate amounts when necessary. Then total all of the overhead costs for a single day. Fill in these amounts in the table on the following page.

| TOTAL OVERHEAD COSTS PER DAY | |
|-------------------------------------|----------|
| RENT PER DAY | \$ _____ |
| UTILITIES PER DAY | \$ _____ |
| SALARIES PER DAY | \$ _____ |
| INSURANCE COSTS PER DAY | \$ _____ |
| EQUIPMENT COSTS PER DAY | \$ _____ |
| OTHER (PER DAY) | \$ _____ |
| TOTAL DAILY OVERHEAD COSTS | \$ _____ |



3. Add the total daily overhead costs to the total daily costs of producing the goods or services. This sum is equal to the net daily costs. Record this amount.

CALCULATIONS

NET DAILY COSTS \$ _____

4. Subtract the net daily costs from the average daily sales. This is the daily net before-tax profit.

CALCULATIONS

Project 14 - GARBAGE EVERY WHERE! HOW MUCH IS IN YOUR HOME TOWN?

Introduction: All of us produce garbage. Some people haul their garbage to the dump each week, some set it all on the curb for pick-up, and many people recycle some of their garbage. In this project you will estimate the amount of garbage generated by your city or a nearby city in a year.

Procedure:

1. In your own city or in a city nearby, interview 10 people, and ask them how many 35-gallon trash cans of garbage per person they fill up in a week. Note: 35 gallons is an average size trash can. Fill in the table with your data.

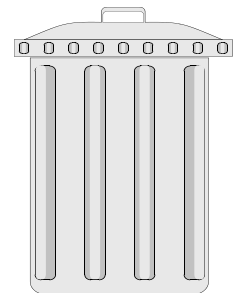
Example: If the person you are interviewing states that their family of four fills up two 35-gallon trash cans, then divide 2 by 4, the number of people in the family. $2 \div 4 = 0.50$ 35-gallon trash cans per person.

| | PERSON 1 | PERSON 2 | PERSON 3 | PERSON 4 | PERSON 5 | PERSON 6 | PERSON 7 | PERSON 8 | PERSON 9 | PERSON 10 |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| 35-GAL. CANS PER PERSON | | | | | | | | | | |

2. Calculate the average number of 35-gallon trash cans filled by each person by adding all 10 results and dividing by 10.

Example: You interviewed 10 people and found that the numbers of 35-gallon cans per person were 0.5, 1.0, 2.0, 0.33, 1.0, 0.25, 0.5, 0.75, 1.0, and 0.5. The average is then calculated by adding all ten of these numbers to obtain a sum of 7.83 and then dividing this sum by 10 to obtain an average of 0.783

CALCULATIONS



70

AVERAGE NUMBER OF 35-GALLON CANS PER PERSON_____

3. Multiply the average number of 35-gallon cans per person by the population of the city. This result is the estimated number of 35-gallon cans of garbage per week. Now, multiply this figure by 35 to obtain the number of gallons per week in the city.

CALCULATIONS

GALLONS OF TRASH PER WEEK IN THE CITY_____

4. Using the fact that 1 gallon is equal to 0.1337 cubic feet, convert your total number of gallons calculated in step 3 into the total number of cubic feet of garbage generated per week.

Example: If you found that there were 70,000 gallons of trash per week in the city, the number of cubic feet is calculated by multiplying 70,000 by 0.1337 .

$70,000 \times 0.1337 = 9,359$ cubic feet of garbage per week.

CALCULATIONS

CUBIC FEET OF GARBAGE PER WEEK_____

5. Using the calculated number of cubic feet of garbage per week, determine how many cubic feet of garbage are generated per year.

CALCULATIONS

CUBIC FEET OF GARBAGE PER YEAR_____

4. Assign each cereal a "taste and nutrition index" which is a value from one to five. One is "best". Five is "worst". Record these indexes in the table below.

5. Add the taste and nutrition index to your previously calculated price per ounce. This is an adjusted price per ounce. Fill in the adjusted prices for all of the cereals. Identify the best priced cereal using the adjusted price.

| ADJUSTED PRICE PER OUNCE | | | |
|---------------------------------|----------------------------------|------------------------|---------------------------------|
| CEREAL TYPE AND SIZE | TASTE AND NUTRITION INDEX | CENTS PER OUNCE | ADJUSTED PRICE PER OUNCE |
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6. Assuming that you purchased 20 ounces of cereal per week, how much would you save in one year (52 weeks) by using the best priced cereal rather than the worst priced cereal?

CALCULATIONS

YEARLY SAVINGS \$ _____



