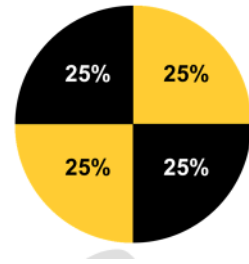




Name _____ Class _____ Date _____

Crash Science in the Classroom

PICTURE THIS: USING GRAPHS TO ILLUSTRATE CRASH SCIENCE DATA



PART 1 - WHAT ARE THREE WAYS SCIENTIFIC DATA CAN BE PRESENTED?

The three options below all display the same data. Which type of presentation do you think is the quickest and easiest to comprehend and why?

OPTION 1: Paragraph Form

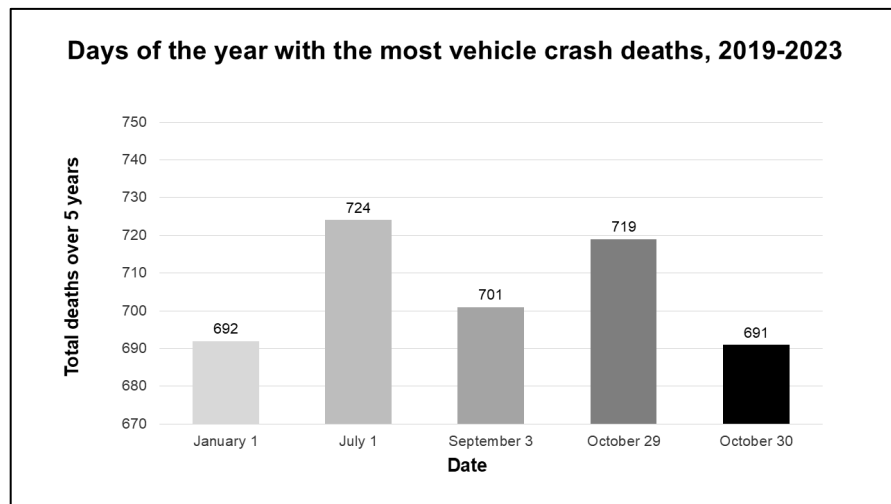
Over the five-year period from 2019 through 2023, the total number of crash fatalities for each day of the year in the U.S. was counted. Researchers analyzed this data to determine the five days of the year with the most vehicle crash deaths. On New Year’s Day (January 1) the total number of vehicle crash deaths over five years was 692. Seven-hundred and nineteen people died in motor vehicle crashes around the Labor Day holiday (September 3) during that 5-year period. And around Halloween, between 2019 and 2023 a total of 719 people died on October 29 and on October 30 a total of 691 people died in fatal vehicle crashes. On the July 4 holiday a total of 724 people died in vehicle crashes over that same 5-year period.

OPTION 2: Data Table Form

Days of the year with the most vehicle crash deaths, 2019-2023

Date	Total deaths over 5 years
January 1	692
July 4	724
September 3	701
October 29	719
October 30	691

OPTION 3: Graph Form

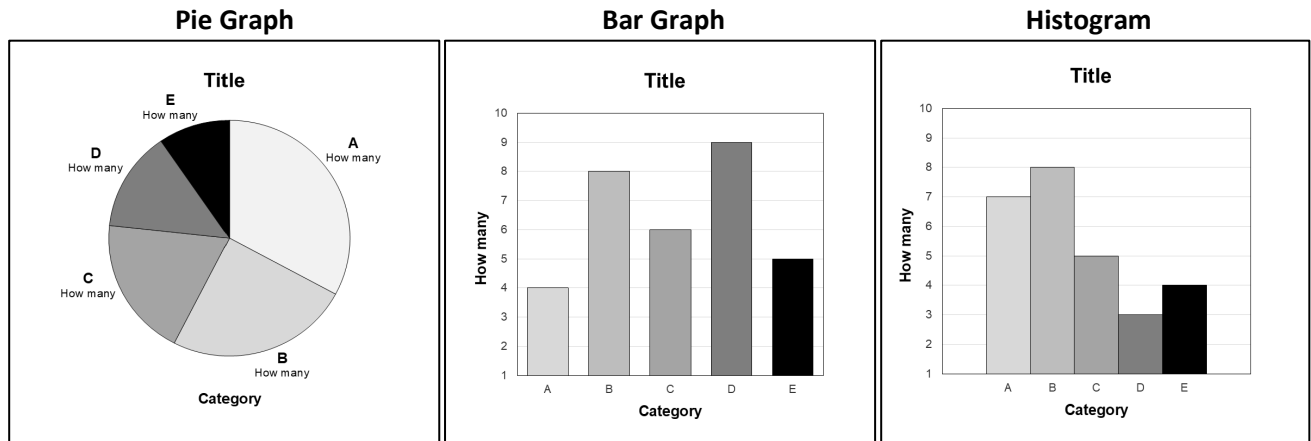


1. Quickest and easiest presentation type to understand (Circle One): Paragraph Data Table Graph

2. Reason for my choice:

PART 2 - WHAT TYPES OF GRAPHS CAN BE USED TO COMMUNICATE SCIENTIFIC DATA?

Observe the commonalities and differences in the 3 different types of graph designs below.



3. Name the three labeling features found in all three types of graphs:

-
-
-

4. Describe the purpose of each type of graph:

- Pie Graph:
- Bar Graph:
- Histogram:

PART 3- CHOOSING THE BEST GRAPH TYPES FOR DISPLAYING CRASH RATE AND CRASH FATALITY DATA

The three data tables below include crash rate and crash fatality data related to 3 specific questions:

1. What time of day is most dangerous for teenage drivers?
2. Which type of crash (frontal, side, rear, or other) is responsible for the most fatalities for all age groups?
3. Which age group has the highest crash rate per million miles traveled?

5. Examine each data table and determine which type of graph (pie graph, bar graph, histogram) would be the best option for displaying the data in each table. Next, briefly describe the reason for each choice in the chart below.

Title of Data Table	Best Type of Graph AND Reason for Each Choice
Teenage motor vehicle crash deaths by time of day	
Passenger vehicle occupant deaths by type of crash	
Crash rates per million miles traveled by driver age	

Data Table 1: Teenage motor vehicle crash deaths by time of day, 2023

Time	Percent of Total Crash Deaths
Midnight to 3 a.m.	16
3 a.m. to 6 a.m.	10
6 a.m. to 9 a.m.	9
9 a.m. to Noon	6
Noon to 3 p.m.	9
3 p.m. to 6 p.m.	14
6 p.m. to 9 p.m.	16
9 p.m. to Midnight	20

Data Table 2: Passenger vehicle occupant deaths by type of crash, 2023

Crash Type	Number of Occupant Deaths
Frontal Impact Crash	14,462
Side Impact Crash	5,352
Rear Impact Crash	1,250
Other (mostly Rollover crashes)	3,174

Data Table 3: Crash rates per million miles traveled by driver age, April 2016-March 2017

Driver Age in Years	Crash Rates per Million Miles Traveled
16-19	17.1
20-23	9.9
24-27	6.1
28-31	6.2
32-35	4.3
36-39	4.1
40-43	3.8
44-47	4.0
48-51	3.3
52-55	3.6
56-59	3.2
60-63	2.9
64-67	2.7
68-71	2.9
72-75	3.1
76-79	4.2
80+	5.7

PART 4 – CONSTRUCTING AND INTERPRETING GRAPHS OF CRASH RATE AND FATALITY DATA

6. Use the graph templates, instruction sheet, and materials provided by your teacher to create a pie graph, bar graph, and histogram using the data provided in the data tables in **Part 3** of this Activity Sheet. Then use each completed graph to answer these 3 major questions:
- What time of day is most dangerous for teenage drivers?
 - Which type of crash (frontal, side, rear, or other) is responsible for the most fatalities for all age groups?
 - Which age group has the highest crash rate per million miles traveled?
7. In the chart below, describe 2 other observations or interpretations regarding crash rates and crash fatalities for each of the graphs you created.

Type of Graph	Observations/Interpretations
Pie graph	1. 2.
Bar graph	1. 2.
Histogram	1. 2.

PART 5 – CRASH SCIENCE RESEARCH AND TEENAGERS

8. Why do you think so much crash science research, especially research on crash rates, focuses on teenagers?

9. Do you think overall crash rates and crash fatality rates are similar for teenage boys and teenage girls?
Why or why not?

FIELD TESTING