



405026-EB

MATH ACTIVITY BOOK

**MIDDLE &
UPPER GRADES**

Statistics & Probability



Reproducible Problems & Exercises for the Classroom

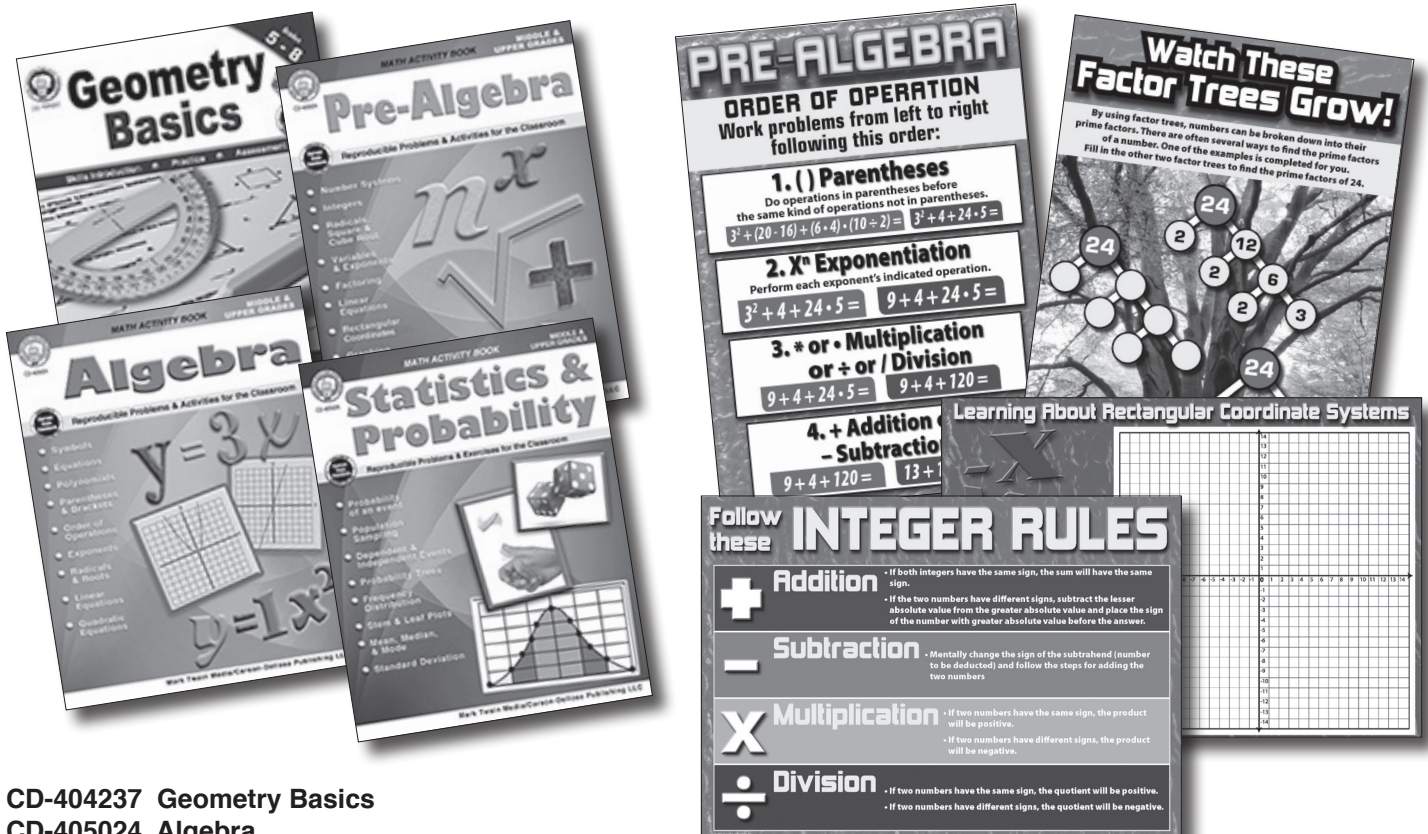
- Probability of an event
- Population Sampling
- Dependent & Independent Events
- Probability Trees
- Frequency Distribution
- Stem & Leaf Plots
- Mean, Median, & Mode
- Standard Deviation



About the Author

Myrl Shireman has been an administrator and teacher in small, medium, and large school districts. He has taught at the elementary, junior high, high school, and college level. Shireman was an associate professor of education at Culver-Stockton College, in Canton, Missouri. Shireman has authored a number of supplemental workbooks for elementary and middle-school students in math, science, geography, and language arts. He is also the author of the *Readers Advance™* leveled reading program that uses a series of 16-page nonfiction science readers for elementary and middle-school students. Myrl has been a presenter at a number of professional conferences, including the California Reading Association Conference.

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Statistics & Probability

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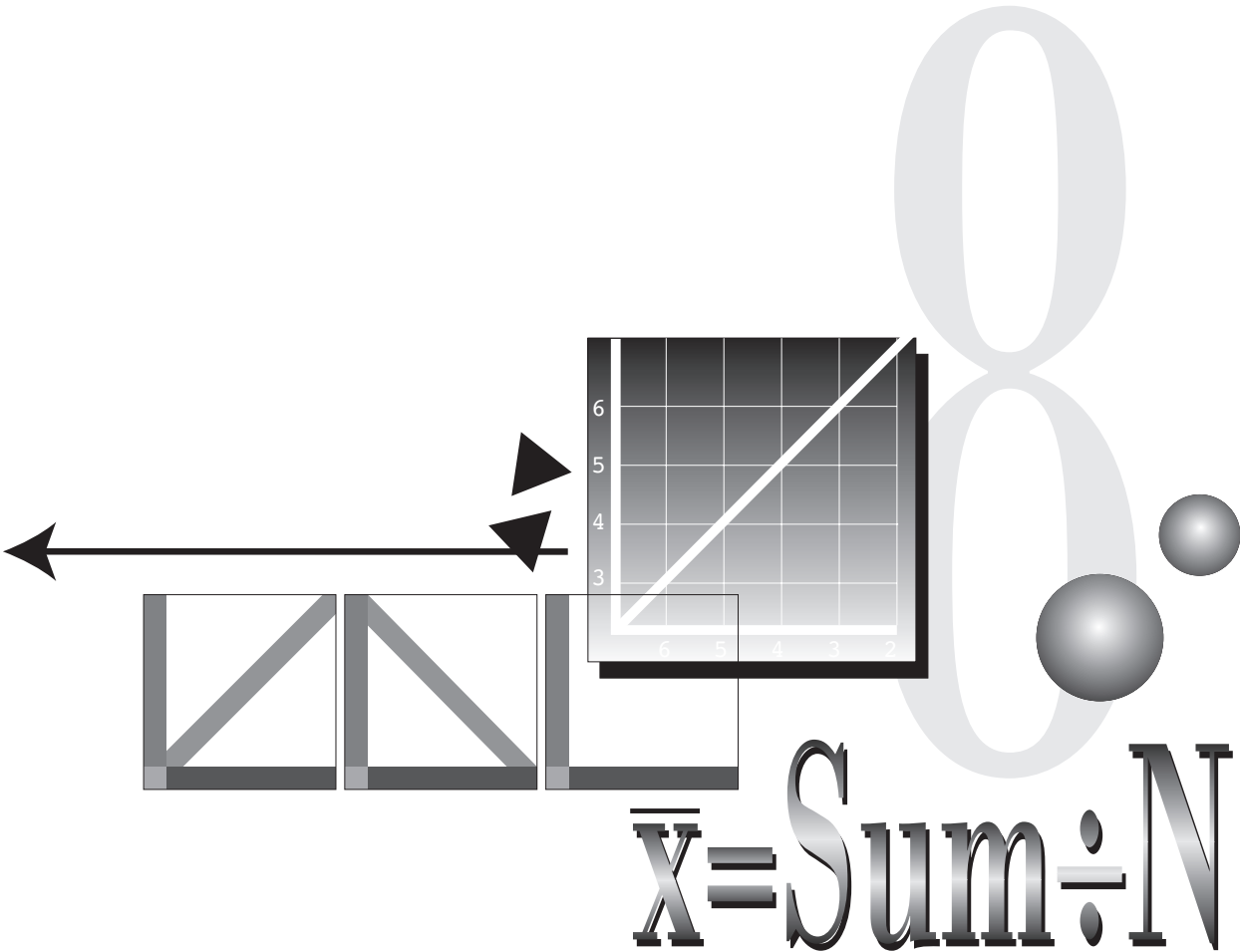


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Introduction

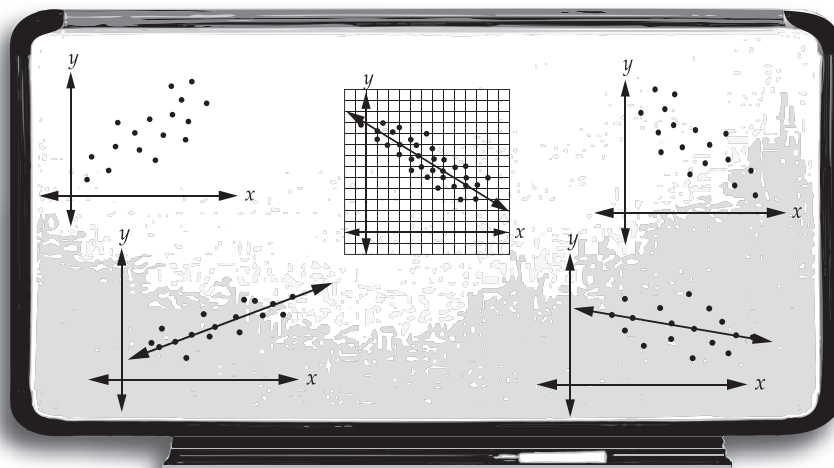


The study and understanding of statistics is becoming increasingly important in middle-school education. The use of statistics is no longer confined to those in a few select occupations. Statistics has come to the front as one of the vital skills needed to function on the factory floor as well as in the corporate office.

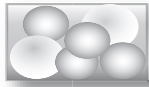
This activity book is designed to introduce the student to the world of probability and statistics. The terms used are the statistical terms middle-school students must become familiar with as they prepare to continue their study of mathematics.

The worksheets are designed to give the student ample opportunity to develop a basic understanding of statistics. Many of the exercises are designed to allow students to organize and interpret data, which are skills so necessary to gaining an understanding of statistics. Other exercises are designed primarily for practice in working with common probability and statistic concepts.

The use of these exercises following a teacher-directed lesson can enhance the students' understanding of the role of statistics in today's world. Teachers are encouraged to make copies and transparencies for guided and independent practice.



Name: _____ Date: _____



Understanding Proper Fractions



Before learning about probability, it is important to review proper fractions. Proper fractions are very important in the study of probability.

Proper fractions are greater than zero and less than one. A proper fraction has a numerator that is smaller than the denominator. In the proper fraction $\frac{1}{2}$, the 1 is the numerator. The 2 is the denominator. It is important to remember that in a proper fraction, the numerator is always smaller than the denominator.

Directions: In the following exercise, write the numerator in the blank beside each problem.

1. $\frac{1}{3}$ _____ 2. $\frac{2}{3}$ _____ 3. $\frac{3}{4}$ _____ 4. $\frac{4}{5}$ _____ 5. $\frac{3}{8}$ _____

6. $\frac{3}{5}$ _____ 7. $\frac{1}{2}$ _____ 8. $\frac{7}{8}$ _____ 9. $\frac{2}{5}$ _____ 10. $\frac{5}{6}$ _____

Directions: In the following exercise, write the denominator in the blank beside each problem.

11. $\frac{1}{3}$ _____ 12. $\frac{2}{3}$ _____ 13. $\frac{3}{4}$ _____ 14. $\frac{4}{5}$ _____ 15. $\frac{3}{8}$ _____

16. $\frac{3}{5}$ _____ 17. $\frac{1}{2}$ _____ 18. $\frac{7}{8}$ _____ 19. $\frac{2}{5}$ _____ 20. $\frac{5}{6}$ _____

Directions: Answer the following questions. Circle the correct answer.

21. In a proper fraction, the [numerator/denominator] is always the smaller number.

22. In a proper fraction, the [numerator/denominator] is always the larger number.

23. Proper fractions always represent a number [smaller/larger] than 1.

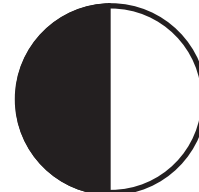
24. In each of the following diagrams, the shaded part equals what fraction of the whole?



a. _____



b. _____



c. _____

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Simplifying Proper Fractions



Many times it is necessary to change a proper fraction into its simplified form before finding the numerator and denominator. For example, the fraction $\frac{2}{4}$ is a proper fraction because the numerator, 2, is less than the denominator, 4. The proper fraction $\frac{2}{4}$ is not yet in its simplest form. A proper fraction is in the simplest form when the numerator and denominator are not divisible by any number other than one.

Example: To change $\frac{2}{4}$ to its simplest form, the numerator and denominator can both be divided by 2.

$$\frac{2 \text{ divided by } 2 = 1}{4 \text{ divided by } 2 = 2}$$

The proper fraction $\frac{2}{4}$ changed to its simplified form is the proper fraction $\frac{1}{2}$.

Directions: In the following exercise, change each of the proper fractions to proper fractions in simplified form.

1. $\frac{2}{6} = \frac{2 \text{ divided by } 2}{6 \text{ divided by } 2} = \underline{\hspace{2cm}}$

2. $\frac{6}{10} = \frac{6 \text{ divided by } 2}{10 \text{ divided by } 2} = \underline{\hspace{2cm}}$

3. $\frac{4}{6} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

4. $\frac{5}{10} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

5. $\frac{9}{12} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

6. $\frac{14}{16} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

7. $\frac{12}{15} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

8. $\frac{4}{10} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

9. $\frac{6}{8} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

10. $\frac{15}{21} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Directions: Each of the following lines has been divided into fractional parts. Although each line is the same length and each line equals one, the fraction parts of each line are different. In these exercises, each of the fractional parts are equal. Write the fraction for each exercise over the fraction parts that make up the line. Then add the fraction parts of each line and complete the exercise.

11. $\frac{1}{5} \quad \frac{1}{5} \quad \frac{1}{5} \quad \frac{1}{5} \quad \frac{1}{5} = \frac{5}{5} = 1$

12. $\underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

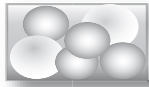
13. $\underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

14. $\underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

15. $\underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

16. $\underline{\hspace{1cm}} \quad \underline{\hspace{1cm}} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

Name: _____ Date: _____



Changing Proper Fractions to Decimals



It is often necessary to change a proper fraction to an equivalent decimal. To change a proper fraction to a decimal, the numerator is divided by the denominator. For example, the proper fraction $\frac{3}{8}$ is changed to a decimal by dividing the numerator, 3, by the denominator, 8.

Example: $\frac{3}{8} = 3 \div 8 = 8 \overline{)3} = 8 \overline{)3.0} = 8 \overline{)3.07} = 8 \overline{)3.075} = 0.375 = 0.38$ (rounded to the nearest hundredth)

$$\begin{array}{r} 0.3 \\ 8 \overline{)3.0} \\ \underline{24} \\ 60 \\ \underline{56} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

Directions: In the following exercise, change each of the proper fractions into decimals, using the example from above. Round each answer to the hundredths place, and place the answer in the appropriate blank.

1. $\frac{1}{3} =$ _____ $=$ _____ $=$ _____

2. $\frac{3}{5} =$ _____ $=$ _____ $=$ _____

3. $\frac{2}{3} =$ _____ $=$ _____ $=$ _____

4. $\frac{1}{2} =$ _____ $=$ _____ $=$ _____

5. $\frac{3}{4} =$ _____ $=$ _____ $=$ _____

6. $\frac{7}{8} =$ _____ $=$ _____ $=$ _____

7. $\frac{4}{5} =$ _____ $=$ _____ $=$ _____

8. $\frac{2}{5} =$ _____ $=$ _____ $=$ _____

9. $\frac{3}{8} =$ _____ $=$ _____ $=$ _____

10. $\frac{5}{6} =$ _____ $=$ _____ $=$ _____