Homework Help for Math Out of the Box
Developing Algebraic Thinking: Signs and Symbols

Information about homework assignments is provided to help parents and other homework helpers with the mathematics ideas that are being developed. The homework help includes definitions of key vocabulary, questions to ask that will help students connect to the classroom investigations, problem solving examples, and other helpful explanations.

Homework 4A1 follows Lesson 1

Example: To represent the letter pattern **ABBABB**, a core of three different elements is repeated. Following is an example of a representation for an **ABBABB** pattern:

A description of this pattern would state that it is a repeating pattern with a core of three elements. The second and third elements are alike and the first element is different.

Homework 4B follows Lesson 6

To extend the pattern, students can compare the top row of numbers and the bottom row of numbers. They can analyze the two rows to determine the relationship between the top and the bottom rows of numbers. Below is an example.

Step Number	1	2	3	4	5	6
Number of pattern blocks	2	4	6	8	10	12

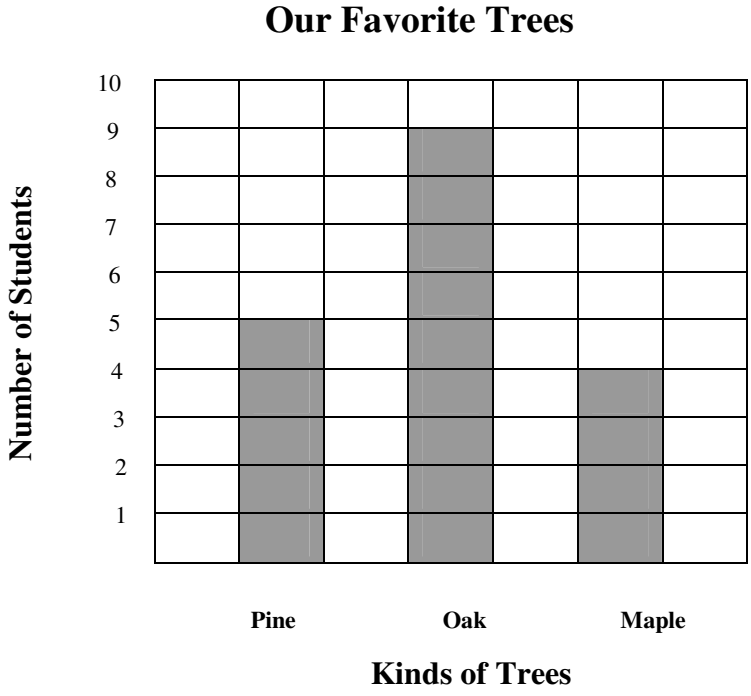
Relationships:
a) Double the step number to get the number of pattern blocks.
b) Multiply the step number by 2 to find the number of pattern blocks.
c) Add the step number to its self.

Rule: S + S = N (S = Step Number; N = Number of pattern blocks)
S x 2 = N (S = Step Number; N = Number of pattern blocks)

Homework 4D follows Lesson 13

A **bar graph** is a type of graph that uses bars to show relationships.

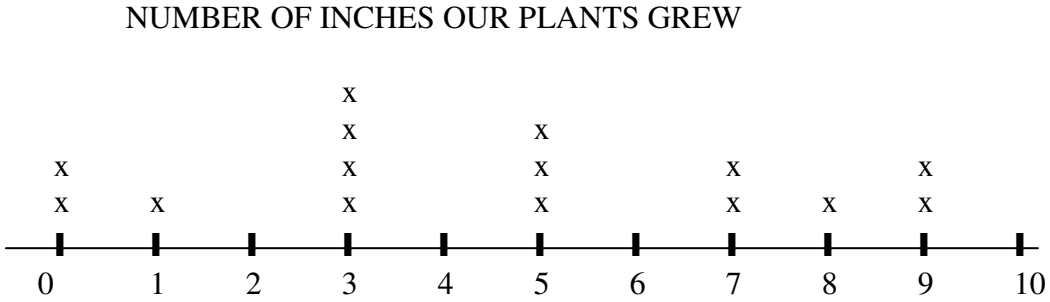
Below is an example of a bar graph. Bars in such a graph should have spaces between them to show that each group is separated from the next group.



Homework 4E follows Lesson 15

A **line plot** is a type of graph that displays data on a number line. The data is displayed with an "x" above the number line. The number of "x's" above a number shows how many times that value occurred in the set of data.

Below is an example of a line plot. In this line plot, the numbers on the number line represent the number of inches a plant grew in 3 weeks. The "x's" represent the number of students whose plants grew that number of inches.



x = 1 student NUMBER OF INCHES

The **mode** is the number of inches that occurs the most.
(The mode of the number line above is 3.)

The **range** is the difference between the largest number and the smallest number on the number line that has data (an "x" above it).
(The range of the number line above is 9 – 0 = 9. The range is 9.)

The **median** is middle number in the data set. To find the median the number set can be written in order from least to greatest. For every "x" above a number on the number line, that number will be listed. For example:

0, 0, 1, 3, 3, 3, 3, 5, 5, 5, 7, 7, 8, 9, 9

Students can mark out one number at the beginning of the data set and one number at the end of the data set. They continue doing this until they find the number in the middle. This is the "median". *(The median of this data set is 5.)*

~~0~~, ~~0~~, ~~1~~, ~~3~~, ~~3~~, ~~3~~, ~~3~~, 5, ~~5~~, ~~5~~, ~~7~~, ~~7~~, ~~8~~, ~~9~~, ~~9~~

Homework 4F follows Lesson 19

A **line graph** is a display in which data is plotted and then connected by a line to show change over time.