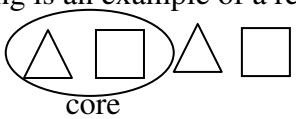
Homework Help for Math Out of the Box
Developing Algebraic Thinking: Plotting and Growing

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 3A1 follows Lesson 4

- The **core** of a pattern is the smallest group of elements that repeats.

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



A description of this pattern would state that it is a repeating pattern with a core of two elements. The two elements can be described as different from each other in some way, such as color, shape, or position.

Homework 3A2 follows Lesson 5

- To verify the answer to question 3, students can continue to draw and number the pattern in the space provided. They may also think of other ways to verify their answer.

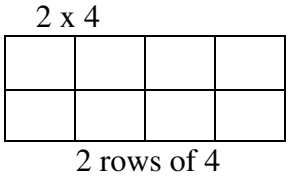
Homework 3B1 follows Lesson 6

The following questions may be helpful in writing a description of the pattern:

- Why is the pattern a growing pattern?
- How would you describe the numbers in your pattern?
- Are the numbers even or odd?
- Are any numbers repeated?

Homework 3B3 follows Lesson 8

An **array** is a way to show a multiplication fact using rows and columns.
Example: 2x4 This means 2 rows with 4 elements in each row.



Homework 3C1 and 3C2 follows Lessons 10 & 11

To determine the missing numbers and find the rule, students may use a variety of strategies, such as comparing the numbers in the Input column and Output column to see if they are increasing or decreasing. They can test the pairs of numbers with addition, subtraction, multiplication, and division. The rule or its inverse can then be applied to the missing numbers.

Homework 3D1 follows Lesson 1

A **fair test** is a plan in which students determine certain standards that will be used in collecting data. The following questions are helpful in setting up a fair test:

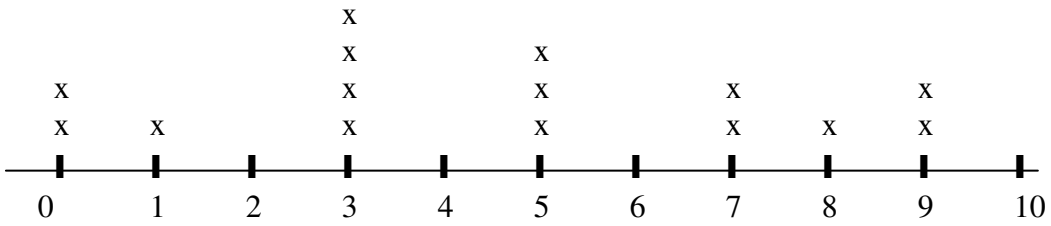
1. What tool will be used?
2. What procedure will we use to measure the object?
3. What units of measure will be used?

Homework 3D2 follows Lesson 14

A **line plot** is a type of graph that displays data on a number line. The data is often 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.

NUMBER OF INCHES OUR PLANTS GREW



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 the 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

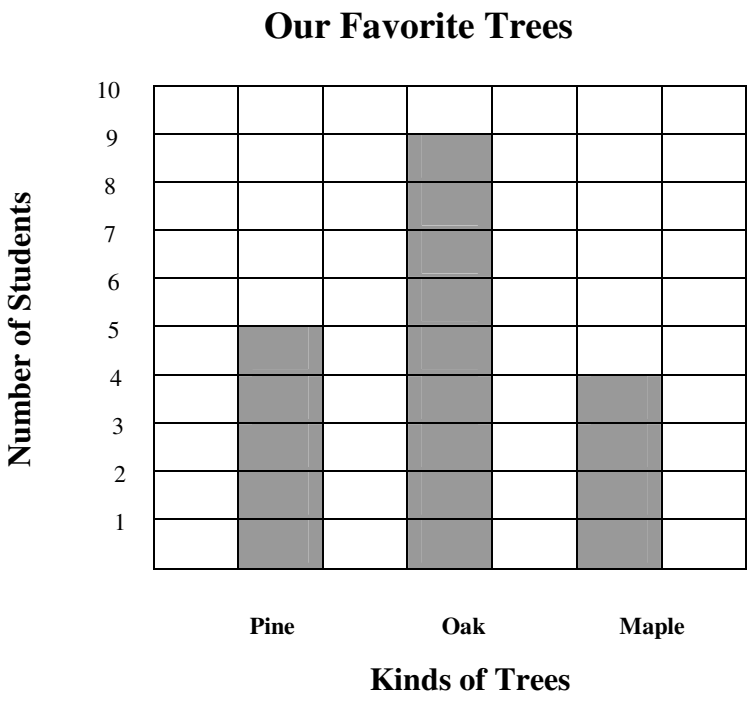
Students can mark out one number at the beginning of the data set and one number at the end of the data set. They will continue doing this until they find the number in the middle. This is the "median". *(The median of this data set is 5.)*

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

Homework 3E follows Lesson 17

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

Below is an example of a bar graph. In a bar graph there is space between the columns or rows representing the different groups of data.



Homework 3F follows Lesson 20

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