What are Algorithms?

- Algorithms are ______________ procedures.
- __________ are useful tools for explaining algorithms.

Developing Algorithms for Addition and Subtraction

- __________ __________ are useful tools for modeling addition and subtraction and developing an algorithm for paper-and-pencil arithmetic.

Modeling using Base-Ten Blocks

- See pages 157-159, example 3.14 for a good example of two different ways of approaching modeling with base-ten blocks.

Modeling using Base-Ten Blocks

- Model the following using base-ten blocks.
- Use the words "_________" (instead of "borrow") and "_________" (instead of "carry") to explain your grouping actions.
  - See page 161.

1) 374 + 128
2) 137 - 48
Modeling Hints

- When ____________, put the _________ number first and then take away the smaller number.

Smile…(watch for “expanded”)

- http://www.youtube.com/watch?v=cqj5Qrxd5M0

Paper-and-Pencil Algorithms for Addition

- Expanded Algorithm (page 160)
  _________ of each number are added first and combined later. The order the numbers are added does not matter.

- Standard Algorithm (page 161)
  Addition starts with the _________ and addition proceeds (with regrouping) from right to left.

Example

- Find the sum of 674 + 598 using the expanded algorithm, then with the standard algorithm.

Paper-and-Pencil Algorithms for Subtraction

- Expanded Algorithm
  Start with the _________ number and repeatedly take away as much as is possible to do mentally before moving from left to right. Subtracting could begin at any place because the order of subtracting will not change the difference.
Paper-and-Pencil Algorithms for Subtraction

● Standard Algorithm
  Subtraction starts with the ones and subtraction proceeds (with regrouping) from right to left. REMEMBER: Use “________” and “________” rather than “borrow” and “carry”.

Example

● Find the difference of 1254 – 917 using the expanded algorithm, then with the standard algorithm.