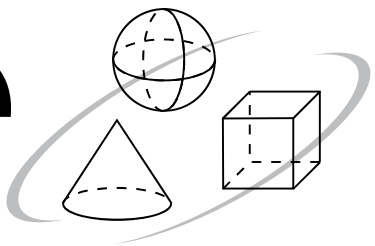
Simple Solutions.



Minutes a Day—Mastery for a Lifetime!

Standards-Based Mathematics 2

Help Pages

Some material addressed in standards covered at earlier grade levels may not be available in these *Help Pages*, but you can access all grade levels of *Simple Solutions Standards-Based Mathematics Help Pages* at SimpleSolutions.org.

Help Pages

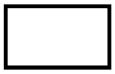
Vocabulary

Arithmetic Operations

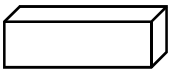
Addition → When you combine numbers, you add. The sign "+" means add. The answer to an addition problem is called the *sum*.
Example: When you combine 5 and 2, the sum is 7; 5 + 2 = 7.

Subtraction → When you take one number away from another, you subtract. The sign "–" means subtract. The answer to a subtraction problem is called the *difference*. **Example**: When you take 1 away from 5, the difference is 4; 5 – 1 = 4.

Geometry - Shapes (Two-dimensional)

Number of Sides	Name	Number of Sides	Name
3 	Triangle	4 	Quadrilateral
5 	Pentagon	6 	Hexagon

Geometry - Solids (Three-dimensional)

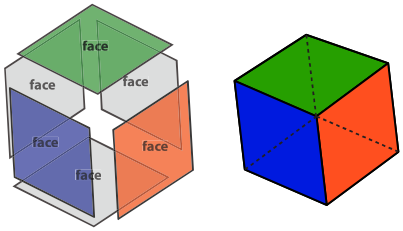
Cone — 	Rectangular Prism — 
Cube — 	Sphere — 
Cylinder — 	

Help Pages

Geometry - Shapes and their Attributes

Cube faces

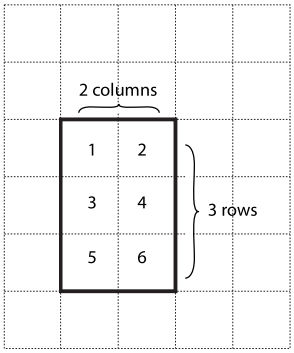
Any side of a three-dimensional shape is called a face. A cube has six faces: top, bottom, front, back, left side, and right side. Each face of a cube looks like a square.



Grid paper

In this book, grids are included in the answer boxes to help you draw a rectangle. Use the grid paper to help you show equal rows and equal columns inside the rectangle.

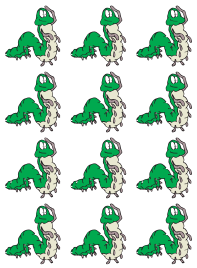
Example: Draw a rectangle having three equal rows and two equal columns. Find the total number of square units.



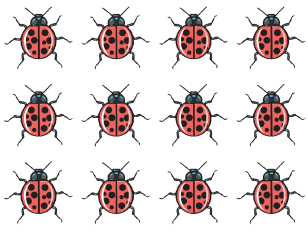
This rectangle has a total of 6 square units.

Arrays

An **array** shows objects in equal rows and equal columns.



This array has four rows of three caterpillars.
Four groups of three are equal to twelve.
3 + 3 + 3 + 3 = 12



This array has three rows of four ladybugs.
Three groups of four are equal to twelve.
4 + 4 + 4 = 12

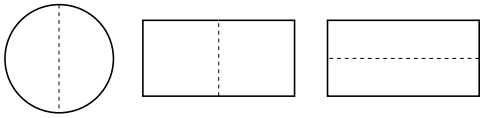
Help Pages

Solved Examples

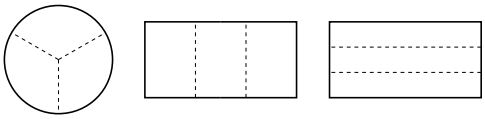
Equal Shares

This box has 4 equal shares or parts.
One fourth is shaded.

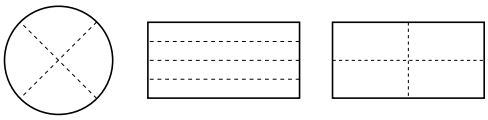
Each of these shapes shows two halves.



Each of these shapes shows three thirds.



Each of these shapes shows four fourths.



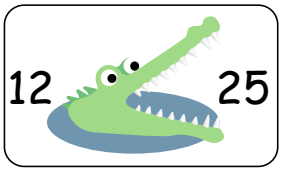
Greater Than and Less Than

Numbers can be compared by saying one is **greater than** another or one is **less than** another.

The symbol "**>**" means *greater than*. The symbol "**<**" means *less than*. Think of the wide part of the sign as an alligator's mouth eating the bigger number. (Hint: The open part of the sign is near the bigger number.)

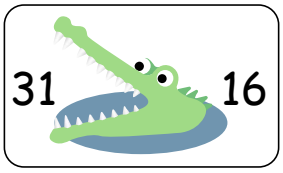
Examples:

12 is less than 25



12 < 25

31 is greater than 16



31 > 16

Help Pages

Solved Examples

Place Value

1, 0 0 0	4 0 5
Thousands Hundreds Tens Ones	Hundreds Tens Ones
The number above is read: one thousand	The number above is read: four hundred five.

Fact Family

A **fact family** is a set of related facts using addition, subtraction, and the same three numbers.

Example: Write a fact family using 3, 4, and 7.

3 + 4 = 7 7 – 3 = 4
4 + 3 = 7 7 – 4 = 3

Base-Ten Numbers

Base-ten numbers can be named in many ways.

Example: These expanded forms all name 234.

two hundred thirty-four

2 hundreds, 3 tens, 4 ones

3 tens, 4 ones, 2 hundreds

234 ones

2 hundreds, 34 ones

23 tens, 4 ones

200 + 30 + 4

Help Pages

Solved Examples

Whole Numbers

When adding or subtracting whole numbers, first the numbers must be lined-up from the right. Starting with the ones place, add (or subtract) the numbers. When adding, if the answer has 2 digits, write the ones digit and regroup the tens digit. For subtraction, it may also be necessary to regroup first. Then, add (or subtract) the numbers in the tens place. Continue with the hundreds, etc.

Look at these examples of **addition**.

Examples: Find the sum of 314 and 12. Add 648 and 236.

$$\begin{array}{r} 314 \\ +\ 12 \\ \hline 326 \end{array}$$

1. Line up the numbers on the right.
2. Beginning with the ones place, add. Regroup if necessary.
3. Repeat with the tens place.
4. Continue this process with the hundreds place, etc.

$$\begin{array}{r} {\scriptstyle 1} \\ 648 \\ +\ 236 \\ \hline 884 \end{array}$$

Use the following examples of **subtraction** to help you.

Example: Subtract 37 from 93.

$$\begin{array}{r} {\scriptstyle 8\ 13} \\ \cancel{9}\ \cancel{3} \\ -\ 3\ 7 \\ \hline 5\ 6 \end{array}$$

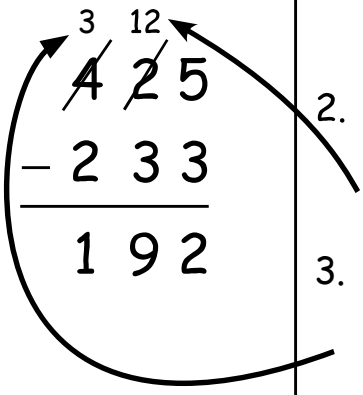
1. Begin with the ones place. Check to see if you need to regroup. Since 7 is larger than 3, you must regroup to 8 tens and 13 ones.
2. Now look at the tens place. Check to see if you need to regroup. Since 3 is less than 8, you do not need to regroup.
3. Subtract each place value beginning with the ones.

Help Pages

Solved Examples

Whole Numbers (continued)

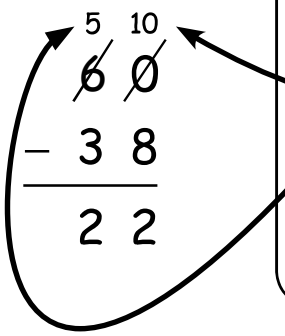
Example: Find the difference of 425 and 233.



1. Begin with the ones place. Check to see if you need to regroup. Since 3 is less than 5, you do not need to regroup.
2. Now look at the tens place. Check to see if you need to regroup. Since 3 is larger than 2, you must regroup to 3 hundreds and 12 tens.
3. Now look at the hundreds place. Check to see if you need to regroup. Since 2 is less than 3, you are ready to subtract.
4. Subtract each place value beginning with the ones.

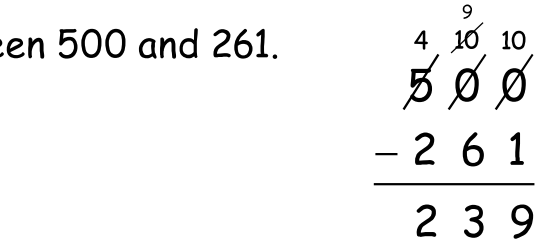
Sometimes when doing subtraction, you must **subtract from zero**. You will always need to regroup. Use the examples below to help you.

Example: Subtract 38 from 60.



1. Begin with the ones place. Since 8 is more than 0, you must regroup.
2. Regroup to 5 tens and 10 ones.
3. Then, subtract each place value beginning with the ones.

Example: Find the difference between 500 and 261.



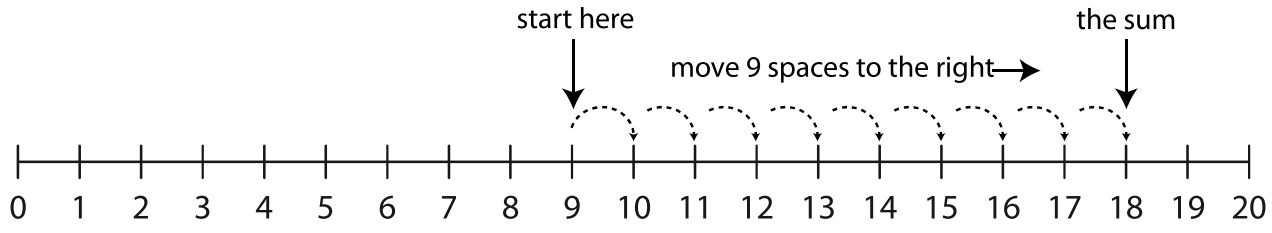
Help Pages

Solved Examples

Number Lines

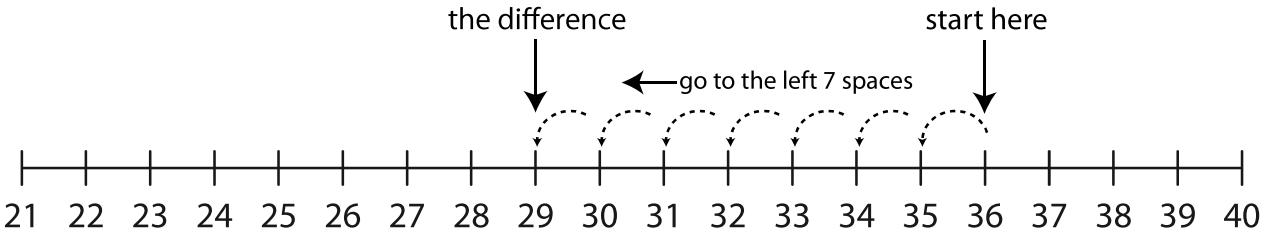
Number lines can help us find sums and differences.

Example: Use the number line to show the sum of 9 + 9.



Start at the first number (9), then **add 9** (go to the right 9 spaces). You end up at 18 (the sum).

Example: Use the number line to show the difference of 36 – 7.



Start at the first number (36), then **subtract 7** (go to the left 7 spaces). You end up at 29 (the difference).

Help Pages

Solved Examples

Graphs

On a **line plot** you can quickly see data. It may be spread out or close together.

To make a line plot,

- Give the line plot a title.
- Find the greatest value and the lowest value in the set of data.
- Draw a number line on the grid paper near the bottom. The number line should begin with the lowest value you found.
- The length of your line should include space to mark from your lowest to your greatest value.
- For each piece of data, draw an "x" above the matching value. An "x" on the line plot will take the place of each number from the data chart. No student names are needed.

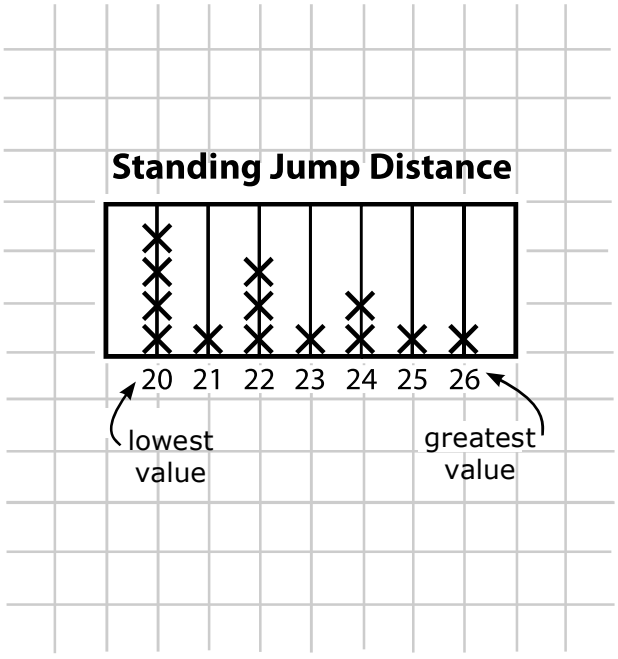
Data Table

Standing Jump Distance	
Students	Inches
Ana	24
Ben	22
Cassie	20
Dora	21
Ellen	20
Fred	23
Gary	22
Hannah	20
Jake	22
Kia	20
Lee	24
Miki	25
Noah	26

lowest number

greatest number

Line Plot



Help Pages

Solved Examples

Graphs (continued)

Picture graphs use pictures or symbols to show and compare data. The survey results in the chart below can be shown on a picture graph.

Terri asked 45 people to vote for a favorite kind of music. First, she made a survey chart to show how people voted. Then, Terri made a picture graph to show how people voted.

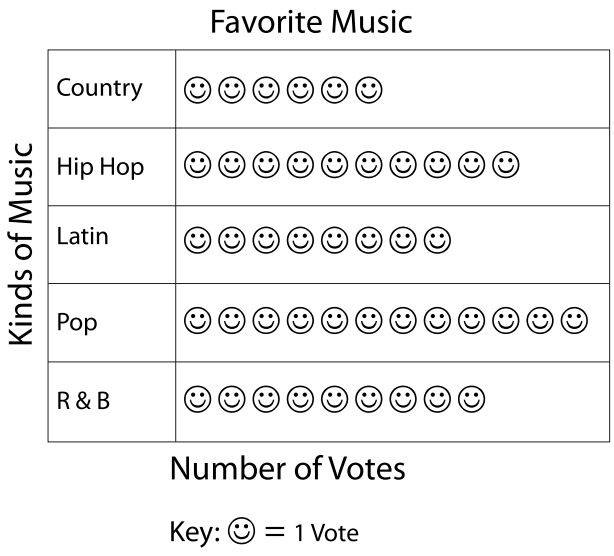
Here is how to make a picture graph:

- Give labels to the two sides of the graph. The labels on Terri's graph are Kinds of Music and Number of Votes.
- Choose a symbol for your data and draw it in a key. This graph shows that one smiley face stands for 1 vote .
- Draw the correct number of symbols next to each item.
- Give the graph a title.

Survey Chart

Favorite Music	
Kind of Music	Number of Votes
Country	6
Hip Hop	10
Latin	8
Pop	12
R & B	9

Picture Graph



Help Pages

Solved Examples

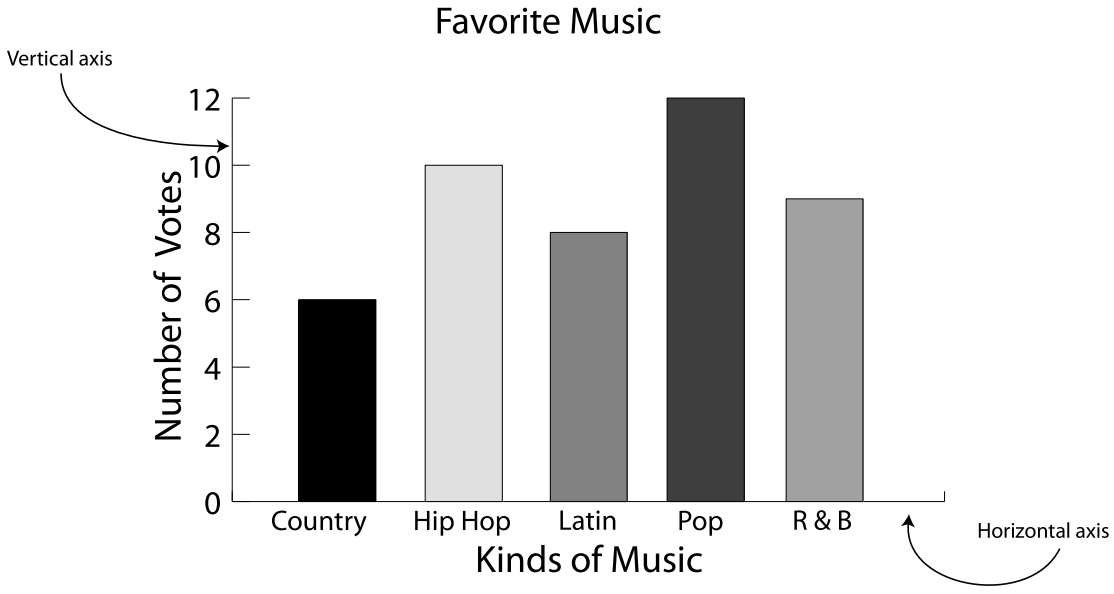
Graphs (continued)

A **bar graph** is another way to show and compare data.

Terri can show her data on a bar graph.

Here is how to make one:

- Give labels to the two sides of the graph (called a horizontal axis and a vertical axis).
- Choose a simple scale for the vertical axis. Start at 0 and go up by 1 or another easy number. This graph goes up by 2.
- Write the kinds of music on the horizontal axis.
- Draw and color in each bar to a height on the graph that matches the number in the survey chart.



Help Pages

Solved Examples

Coins

The two sides of 4 coins are shown here.

A **penny** is worth 1¢.

A **nickel** is worth 5¢.

A **dime** is worth 10¢.

A **quarter** is worth 25¢.

Measurement – Relationships

Time	Distance
30 minutes = 1 half-hour	12 inches = 1 foot
60 minutes = 1 hour	100 centimeters = 1 meter

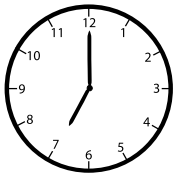
Help Pages

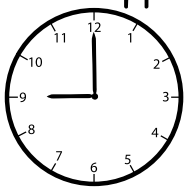
Solved Examples

Time

The measure of how long something takes to happen is called **elapsed time**.

Example:





The movie began at 7:00 and ended at 9:00.

How long did the movie last? (How much time passed between 7:00 and 9:00?) There are **2 hours** between 7:00 and 9:00.

Example:

How many hours pass from the beginning of Spelling class until the end of Math class?

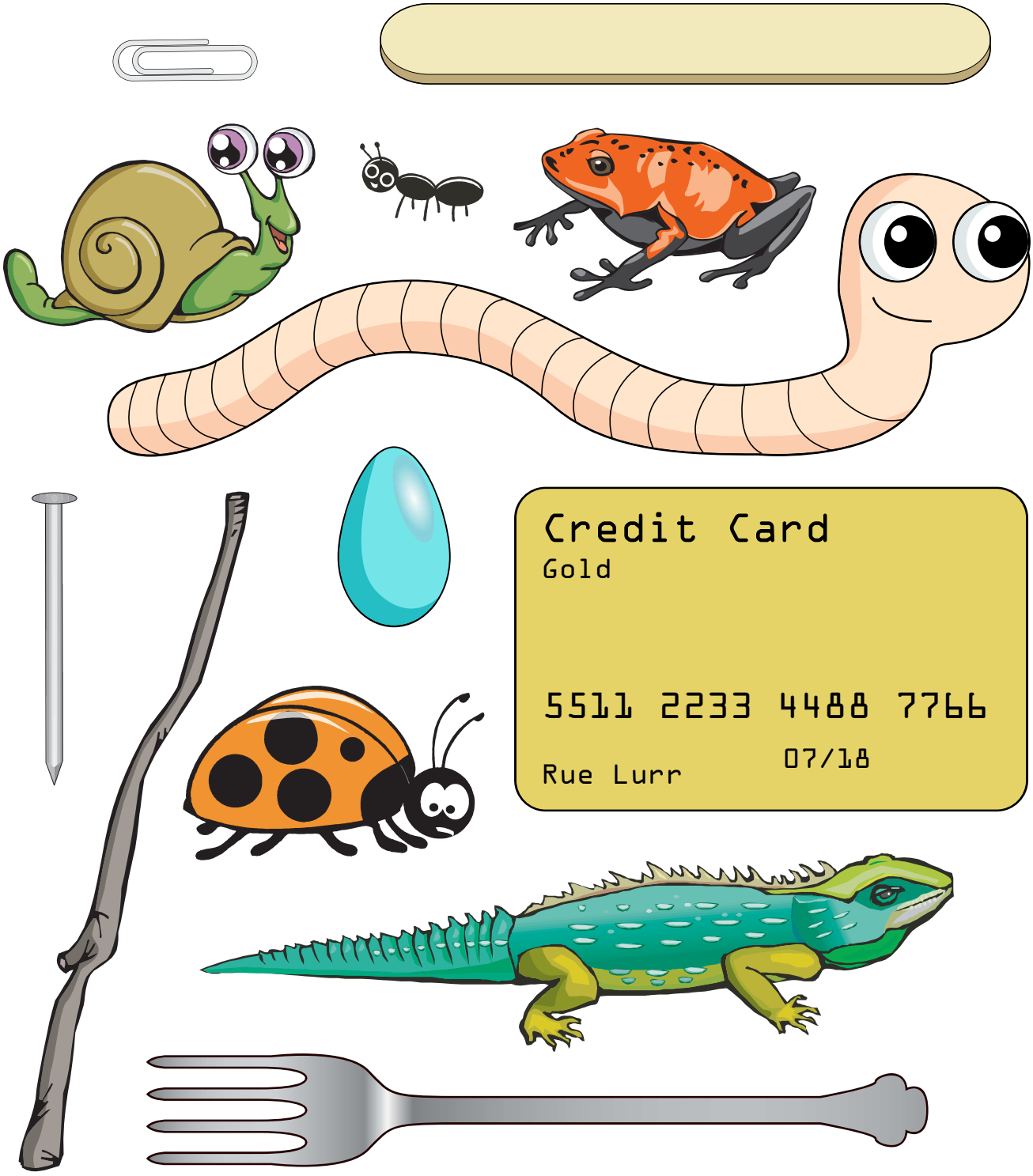
Spelling starts at 8:30. Math ends at 11:30. (How much time passes between 8:30 and 11:30?)

Class Schedule

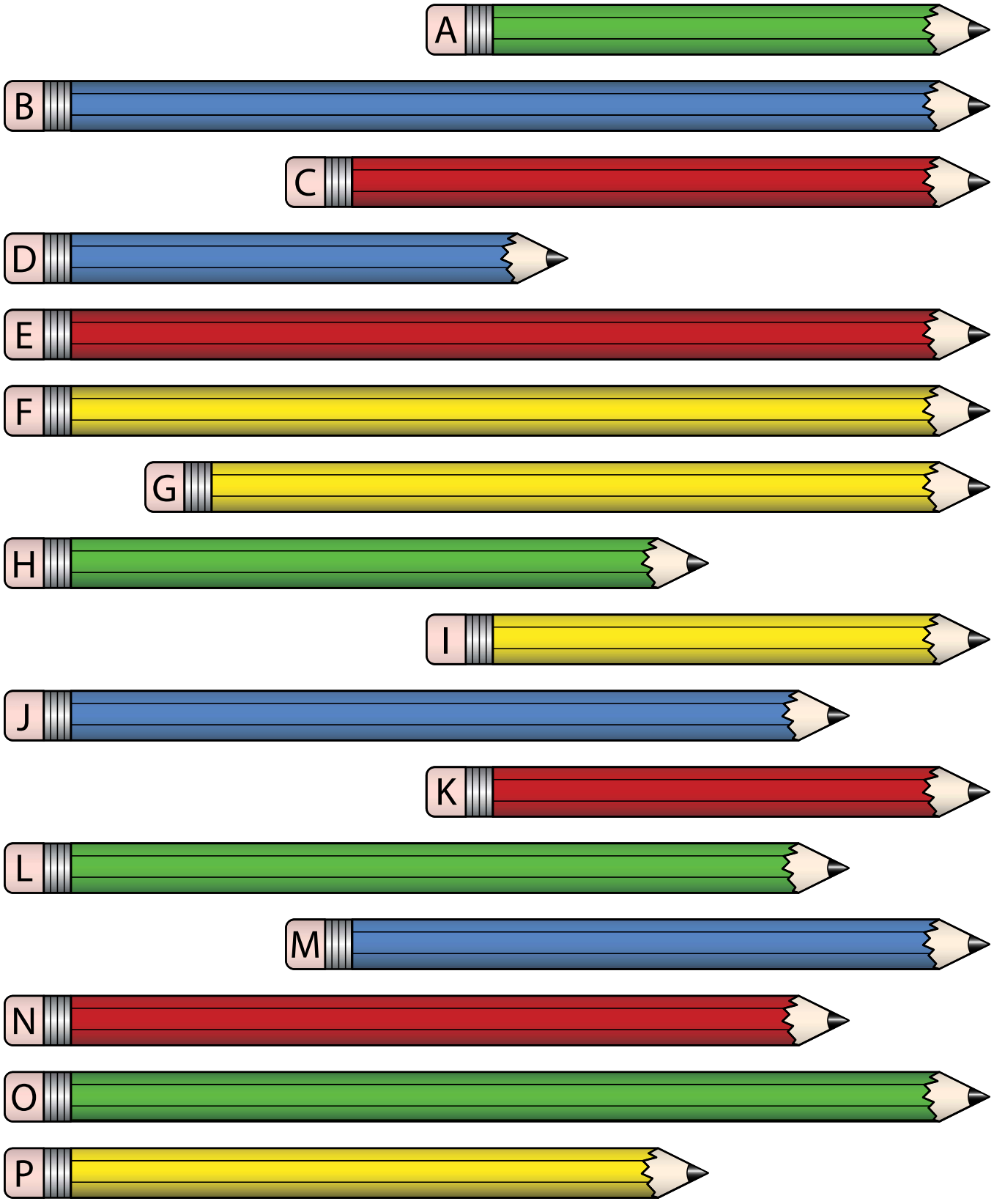
8:30 – 9:00	Spelling
9:00 – 10:00	Reading
10:00 – 11:30	Math
11:30 – 12:00	English

There are **3 hours** between 8:30 and 11:30.

Hands-On Pages



Hands-On Pages

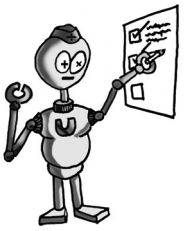


Problem Solving Strategies

Make an Organized List

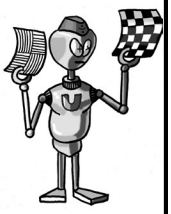
An **organized list** of possible answers for a problem uses an order that makes sense to you so that you do not miss any ideas or write the same answer more than once.

Guess and Check



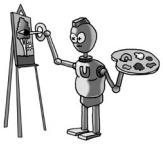
For the **guess and check** strategy, take a guess and see if it fits all the clues by checking each one. If it does, you have solved the problem. If it doesn't, keep trying until it works out. One way to know you have the best answer is when your answer fits <u>every</u> clue.

Look for a Pattern



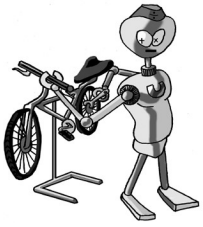
Sometimes math problems ask us to *continue a pattern by writing what comes next*. A **pattern** is an idea that repeats. In order to write what comes next in the pattern, you will first need to study the given information. As you study it, see if there is an idea that repeats.

Draw a Picture



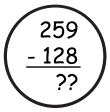
When you **draw a picture** it helps you see the ideas you are trying to understand. The picture makes it easier to understand the words.

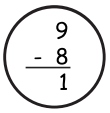
Work Backward



Using this strategy comes in handy when you know the end of a problem and the steps along the way, but you don't know how the problem began. If you start at the end and do the steps in reverse order you will end up at the beginning.

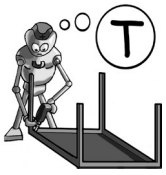
Solve a Simpler Problem





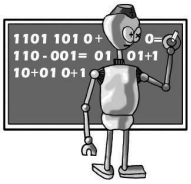
When you read a math problem with ideas that seem too big to understand, try to **solve a simpler problem**. Instead of giving up or skipping that problem, replace the harder numbers with easier ones.

Make a Table



Tables have columns and rows. Labels are helpful too. Writing your ideas in this type of table (or chart) can help you organize the information in a problem so you can find an answer more easily. Sometimes it will make a pattern show up that you did not see before.

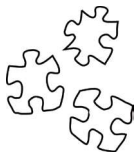
Write a Number Sentence



A **number sentence** is made up of numbers and math symbols (+ − × ÷ > < =). To use this strategy you will turn the words of a problem into numbers and symbols.

Problem Solving Strategies (continued)

Use Logical Reasoning



Logical reasoning is basically common sense. **Logical** means "sensible." **Reasoning** is "a way of thinking." **Logical reasoning** is done one step at a time until you see the whole answer.

Make a Model

A **model** can be a picture you draw, or an object you make or find to **help you understand the words** of a problem. These objects can be coins, paper clips, paper for folding, or cubes.