Everyday **Mathematics**

Parent Resource Handbook

Grades 1-2

South Western School District

Dear Parents,

This booklet is designed to be a reference tool for you and your child to use as you work together to complete homework assignemnts and to prepare for tests and quizes. It is our hope that you will keep this booklet somewhere safe and accessible for use this entire school year. "Home links" is the name of the homework component of Everyday Mathematics. These assignments are intended to involve the family in a number of ways: playing games, collecting data for class projects, and practicing skills taught in class.

Parents can help:

1. **Help with basic fact memorization**
   Students who are able to memorize basic addition, subtraction, multiplication and division facts have a distinct advantage. Students should have addition and subtraction facts to 20 memorized by 3rd grade. Multiplication and division facts to 100 should be memorized by 4th grade.

2. **Be open to alternative ways of computing**
   Your child will be learning a number of new, research based ways to add, subtract, multiply, and divide. Feel free to share your strategy with your child. However, do not insist upon your child doing it the way you learned it. Alternative algorithms often reveal more underlying math concepts than the traditional algorithms do.

3. **Ask questions rather than give answers**
   Ask, "How did you do this in class?"
   Ask, "Tell me what you were thinking… How did you get that answer?"

4. **Use on-line resources:**
   http://www.swsd.k12.pa.us/~rina_iati/ The South Western Math Coach's page
   http://everydaymath.uchicago.edu/ - The Everyday Math Center
   http://www.wrightgroup.com - to purchase EM games and materials

5. **Communicate with your child's teacher**

Frequently Asked Questions

Parent Involvement

Q: How can I get involved? How can I reinforce my child's mathematics learning at home?

A: Communicate with your child's teacher on a regular basis. If possible volunteer to help with Explorations or Projects. Attend school functions, such as Math Night, planned to inform you about Everyday Mathematics and your child's progress. At home, talk with your child about real-life situations that involve math such as buying groceries, or balancing the checkbook. Ask your child to "teach" you the mathematics lessons he is learning, including favorite games and creative solutions strategies.

Basic Facts

Q: Will my child learn and practice basic facts?

A: Your child will learn and practice all of the basic facts in many different ways without having to complete an overwhelming number of drill pages. She will play mathematics games in which numbers are generated randomly by dice, dominoes, spinners or cards. She will work with Fact Triangles, which present fact families and stress the addition/subtraction and multiplication/division relationships. In fourth grade she will take timed "50 facts" multiplication tests that will require her to learn the facts she does not already know. She will have continuing access to addition/subtraction and multiplication/division fact tables that will serve as references for the facts she does not yet know and as records of the facts she does. She will also take part in short oral drills to review facts with her classmates.

Computation

Q: Does my child have opportunities to learn, develop, and practice computation skills?

A: Your child gains the fact knowledge he needs for computation from basic facts practice. He solves problems in a meaningful way through number stories about real-life situations that require him to understand the need for computation, which operations to use, and how to use those operations. He often has the opportunity to develop and explain his own strategies for solving problems through algorithm invention. He practices mental arithmetic during Minute Math and 5-Minute Math. He also performs activities that encourage him to round or estimate numbers mentally.

Focus Algorithms

Q: What are focus algorithms?

A: Children spend a lot of time in the early stages of learning about computation experimenting with and sharing their own problem-solving methods instead of simply learning a set of prescribed standard algorithms. Everyday Mathematics also includes a focus algorithm for each operation – addition, subtraction, multiplication, division. These algorithms are powerful and relatively efficient, and most are easier to understand than traditional algorithms. All children are expected to master the focus algorithms for each operation. Once they show they have mastered it, they are free to use any method to solve problems. Given a choice, however, most children prefer their own procedures.

Mastery

Q: Why does my child have to move on to the next lesson if he hasn't mastered skills in the current lesson?

A. Mastery varies with each child and depends on his learning style and problem solving style. Because people rarely master a new concept or skill after only one exposure, the program has a repeated exposure approach that informally introduces topics for two years before formal study. This approach offers both consistent follow-up and a variety of experiences. If your child does not master a topic the first time it is introduced, he will have the opportunity to increase his understanding the next time it is presented. Your child will regularly review and practice new concepts by playing content- specific games and by completing written exercises and assessments.

Addressing Individual Needs

Q: My child has special needs. Will she be able to succeed in the program? How can the program address her individual needs?

A: *Everyday Mathematics* is designed to be flexible and to offer many opportunities for teachers to meet the varying needs of each child. There are many open-ended activities that will allow your child to succeed at her current skill level. While playing games, inventing algorithms, writing number stories, and solving problems in Minute Math and Math Boxes exercises, your child will develop her strengths and improve in the weak areas. Furthermore, your child's teacher may group student to best suit their needs. The teacher may also modify or adjust program materials according to student needs.

Games

Q: Why does my child play games in class?

A: Everyday Mathematics games reinforce concepts in a valuable and enjoyable way. They are designed to help your child practice his basic facts and computation skills and develop increasingly difficult concepts. Certain games give your child experience using a calculator, while other games emphasize the relationship between the money system and place value.

Assessment

Q: How do you measure my child's progress? What can you show me that demonstrates what she has learned?

A: Teachers assess understanding periodically and on an ongoing basis. Teachers frequently make detailed written observations of students' progress as they watch students working on Math Boxes or slate activities. They also evaluate students' responses to Math Messages. Teachers use unit reviews, quizzes, and tests to evaluate individual student progress. Teachers may also use checklists to show student progress. The checklist may be divided into categories describing different skill levels such as Beginning, Developing, and Secure. Using these categories, the teacher indicates your child's skill in and understanding of a particular mathematical topic. The teacher can use this record of progress to decide which areas need review and whether certain students need additional help or challenge.

Calculators

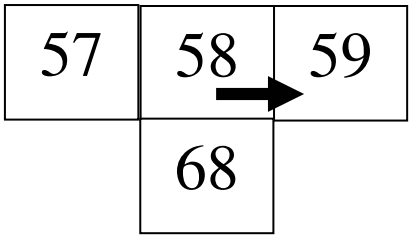
Q: Why is my child using a calculator? Will he become dependent on the calculator for solving problems?

A: Your child uses a calculator to learn concepts, recognize patterns, develop estimation skills, and explore problem solving. He learns when a calculator can help solve problems beyond his current paper and pencil capabilities. He learns that in some situations, he can rely on his own problem solving power to get an answer more quickly. Your child also uses basic facts and operations knowledge and estimation skills to determine whether the calculator's solution is reasonable. He becomes comfortable with the calculator as one technological tool.

Number Grid Pattern

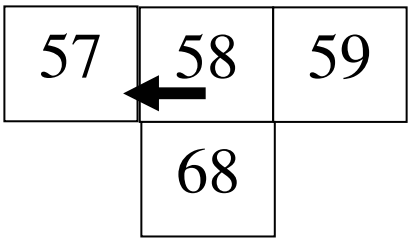
Skip Counting	2s = ○	5s = ●	10s = ▲

Move right +1



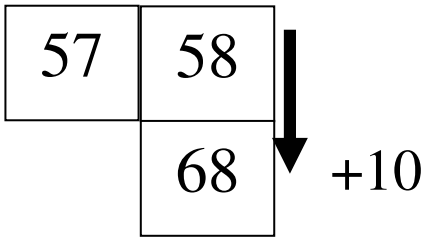
58 + 1 = 59

Move left -1



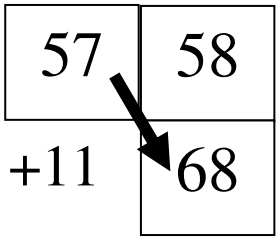
58 – 1 = 57

Move down



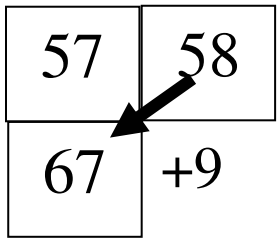
58 + 10 = 68

Move down-right



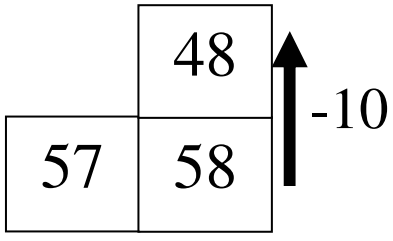
57 + 11 = 68 or
57 + 10 + 1 = 68

Move down-left



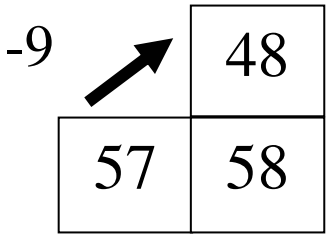
58 + 9 = 67 or
58 + 10 – 1 = 67

Move up



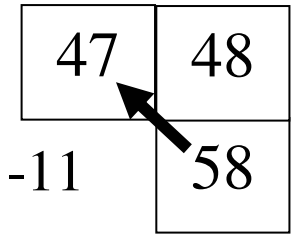
58 – 10 = 48

Move up-right



57 – 9 = 48 or
57 -10 +1 = 48

Move up-left



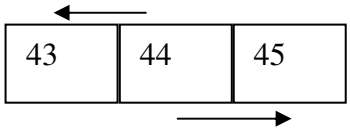
58 – 11 = 47 or
58 – 10 – 1 = 47

The Number Grid

*The **Number Grid** is used to develop number sense and strategies for mental computation. Everyday Math believes that **number sense is** crucial. Students must have enough experience with numbers of various kinds and sizes to have a feeling for where they come from, what they mean, and how numbers work. Which numbers make sense in a given situation? What is a reasonable answer? Number sense helps students check the accuracy of answers regardless of the means by which they were obtained*

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Each movement to the right on the number grid increases the number by one. Each movement to the left decreases by one.



Each movement up the grid decreases the number by 10. Each movement down increases by 10.

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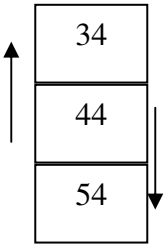
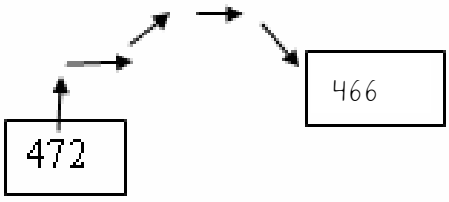


Students apply the above concepts to fill in number grid puzzles, and arrow path puzzles

Number Grid Puzzle

74	75	76
	85	
	95	96

Arrow Path Puzzle



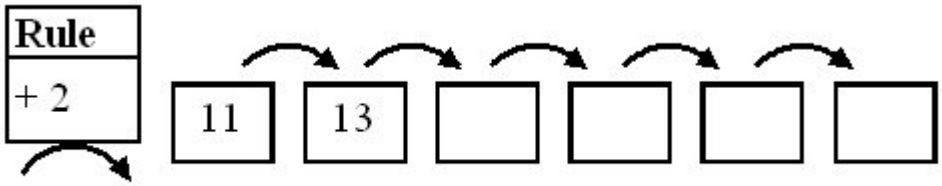
Over time, and with repeated exposure to number grid and arrow puzzles, students can develop a "mental picture" of the number grid, and access it in order to add or subtract mentally.
For example: 56+24 would be "start at 56, move down two blocks, and right four blocks to get to 80."

56 – 24 would be, "Start at 56, move up 2 blocks, and left 4 blocks to get to 32.

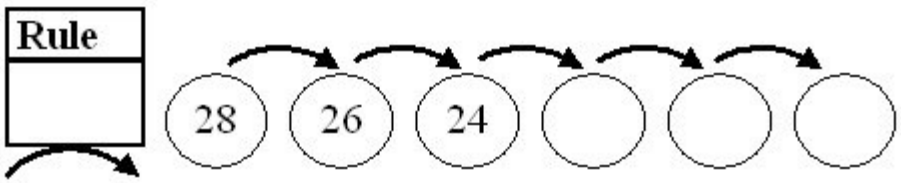
-9	-8	-7	-6	-5	-4	-3	-2	-1	0
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120

Frames and Arrows and Chains

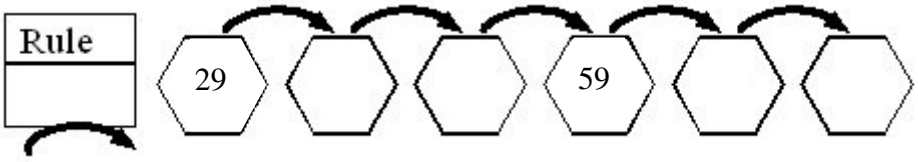
Frames and arrows diagrams consist of frames connected by arrows to show the path for moving from one frame to another. Each frame contains a number in the sequence; each arrow represents a rule that determines what number goes in the next frame. They are sometimes called Chains. Here is a simple example of a Frames and Arrow diagram.



In frames and arrows problems, some of the information has been left out of the diagram. Children solve the problem by supplying the missing information. In this example, some of the frames are filled in, but the rule is missing. Find the rule.



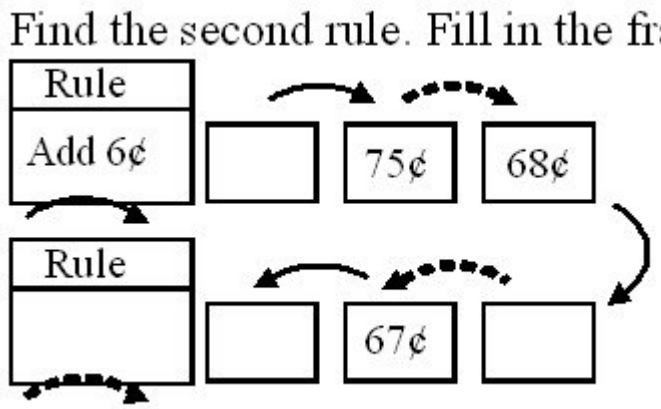
Solution: The rule is subtract 2. Write 22, 20, and 18 in the empty frames.



This one is harder since students must decide what the rule is with frames missing in between numbers.

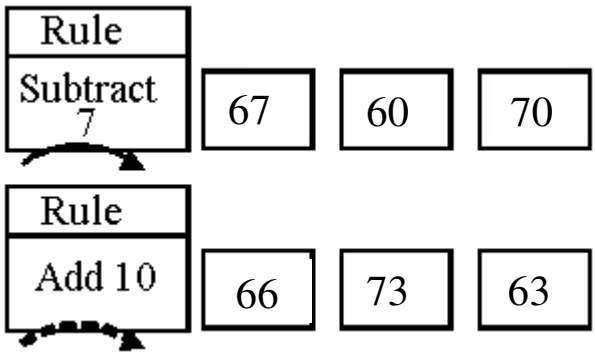
Solution: The rule is +10. Write 39, 49, 69, 79 in the empty frames.

A chain can have more than one arrow rule. If it does, the arrow for each rule must look different. For example, you can use different colors or different designs to distinguish between arrow rules. In the following example, two different arrows are used to distinguish between two different rules.



Solution: Second rule is - 7¢. Write 69¢, 74¢, 73¢

In the following example, the rules are given and the frames are filled in, but the arrows between the frames are missing. Draw the arrows in the proper positions.



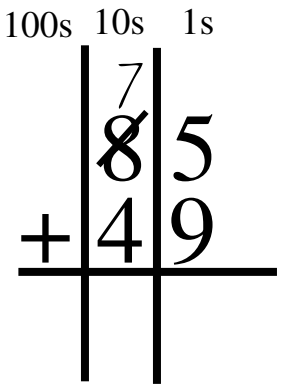
Solution: Draw -7 arrow from 67 to 60, from 70 to 63, and 73 to 66. Draw the +10 arrow from 60 to 70, and from 63 to 73

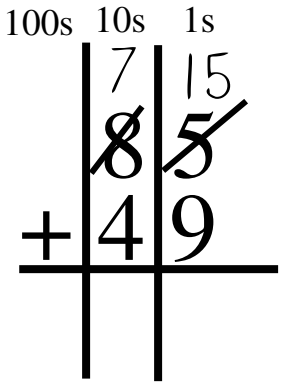
The Trade-First Way

The Problem

$$\begin{array}{r} 85 \\ -\,49 \\ \hline \end{array}$$

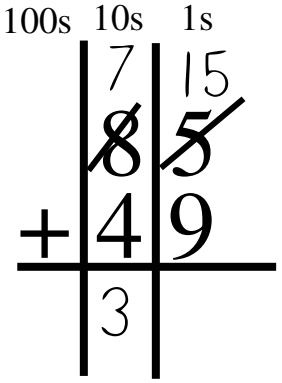
Step 1: Work from left to right. Look at the 10s place. If the top digit is lesser (smaller) than the bottom digit, trade. It is not. Look at the 1s place. If the bottom number is lesser than the top, trade 1 ten for 10 ones

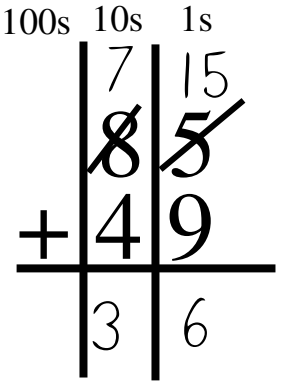




Step 2:

Now subtract each column from left to right.





The ANSWER

36

The Counting-Up Way

The Problem

$$\begin{array}{r} 85 \\ -\,49 \\ \hline \end{array}$$

Step 1:
Write the lesser (smaller) number.

49

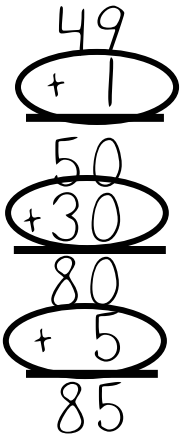
Step 2:
Count up to the nearest 10

$$\begin{array}{r} 49 \\ +\ 1 \\ \hline 50 \end{array}$$

Step 3:
Now count up to the larger number

$$\begin{array}{r} 49 \\ +\ 1 \\ \hline 50 \\ +30 \\ \hline 80 \\ +\ 5 \\ \hline 85 \end{array}$$

Step 4:
Circle the numbers that you counted up.



Step 5:
Then add the numbers you circled.

$$\begin{array}{r} 49 \\ +\ 1 \\ \hline 50 \\ +30 \\ \hline 80 \\ +\ 5 \\ \hline 85 \end{array} \qquad \begin{array}{r} 1 \\ 30 \\ +5 \\ \hline 36 \end{array}$$

You counted up 36
So 85 - 49 = 36

The ANSWER

36

The Left-to-Right Way

The Problem

$$\begin{array}{r} 85 \\ -\ 49 \\ \hline \end{array}$$

Step 1: Rewrite the bottom number as 40 + 9 and subtract the 10s (40) from the top number.

$$\begin{array}{r} 85 \\ -\ 40 \\ \hline 45 \end{array}$$

Step 2:

Now subtract the ones from the top number.

$$\begin{array}{r} 85 \\ -\ 40 \\ \hline 45 \\ -\ 9 \\ \hline \end{array}$$

$$\begin{array}{r} 85 \\ +40 \\ \hline 45 \\ -\ 9 \\ \hline 36 \end{array}$$

The ANSWER

36

The Partial Sums Way

The Problem

$$\begin{array}{r} 87 \\ +\,48 \\ \hline \end{array}$$

Step 1:
Add the tens

$$\begin{array}{r} 87 \\ +\,48 \\ \hline 120 \end{array}$$

80
+ 40

Step 2:
Add the ones.

$$\begin{array}{r} 87 \\ +\,48 \\ \hline 120 \\ 15 \end{array}$$

7
+ 8

Step 3:
Add the sums of the tens and the ones.

$$\begin{array}{r} 87 \\ +\,48 \\ \hline 120 \\ +\,15 \\ \hline 135 \end{array}$$

The ANSWER

135

Column Addition

The Problem

$$\begin{array}{r} 87 \\ +\ 48 \\ \hline \end{array}$$

Step 1: Draw lines

100s	10s	1s
	8	7
+	4	8

Step 2:
Add each column.

100s	10s	1s
	8	7
+	4	8
	12	15

Step 3:
If there are 2 digits in the 1s place, trade 10 ones for 1 ten.

100s	10s	1s
	8	7
+	4	8
	12	15
	~~13~~	~~5~~

Step 4: If there are 2 digits in the 10s place, trade 10 tens for 1 hundred.

100s	10s	1s
	8	7
+	4	8
	12	15
	~~13~~	~~5~~
	~~3~~	5

The answer:

135

Addition and Subtraction Diagrams

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Parts and Total Diagrams

A parts and total diagram is used to represent problems in which two or more quantities (parts) are combined to form a total quantity.

Twelve fourth graders, 8 third graders and 5 first graders are on a bus. How many children in all are on the bus?

Total		
?		
Part 12	**Part** 8	**Part** 5

The parts are known. You are looking for the total. Possible number model:

12 + 8 + 5 = 25

Thirty-five children are riding on the bus. Twenty of them are boys. How many girls are riding the bus?

Total	
35	
Part	**Part**
20	?

If you know the total, but not all of the parts, then you could use subtraction instead of addition to find the unknown part.

One part and the total are known. You are looking for the other part. Possible number models:

20 + 15 = 35 35 – 20 = 15

Change Diagrams

Change diagrams are used to represent problems in which a given quantity (start) is increased or decreased.

Twenty five children are riding on the bus. At the next stop, 5 more children get on. How many children are on the bus now?

Start	Change	End
20	+5	?

The number with which you started has been increased. Possible number model:

25 + 5 = 30

There are 30 children on the bus now.

A bus leaves school with 35 children. At the first stop, 6 children get off. How many children are left on the bus?

Start	Change	End
35	-6	?

The number with which you started has been decreased. Possible number models:

35 – 6 = 29 6 + 29 = 35

Compare Diagrams

Compare diagrams are used to represent problems in which two quantities are given and you try to find how much more or how much less one quanitity is than the other (the difference).

There are 12 fourth graders and 8 third graders. How many more fourth graders are there than third graders?

Quantity	
12	
Quantity	**Difference**
8	?

You are comparing the number of fourth graders with the number of third graders. Possible number models:

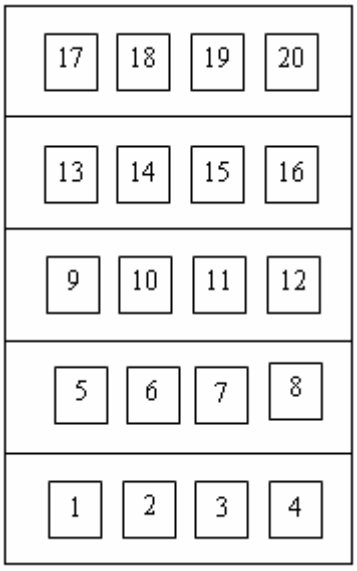
12 – 8 = 4 8 + 4 = 12

Solution: There are 4 more fourth graders than there are third graders.

Four Ways to Multiply

The tower is 5 floors high. There are 4 windows on each floor. How many windows in all?

Picture



20 windows

Array

XXXX
XXXX
XXXX
XXXX
XXXX

20 windows

Repeated Addition

4
4
4
4
+ 4

20 windows

Number Model

5
x 4

20 windows

Coins

Penny $\frac{1}{100}$

1¢ or $0.01

Nickel $\frac{1}{20}$

5¢ or $0.05

Dime $\frac{1}{10}$

10¢ or $0.10

Quarter $\frac{1}{4}$

25¢ or $0.25

Counting Quarters

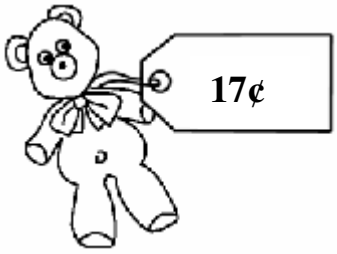
25¢

50¢

75¢

100¢ or $1

Making Change: Counting Up

Buy:	Pay: 25¢	To make change start with the cost (17¢) and count up to the amount you paid (25¢).
		

First use pennies to get 0 or 5 ones.

17¢

18¢

19¢

20¢

20 has 0 ones

Next add (N), (D), and/or (Q) to count up to the number you paid.

17¢

18¢

19¢

20¢

25¢

Stop! You reached the amount you paid!

Now count up the coins to find your change.

5¢

6¢

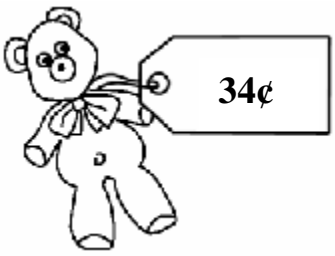
7¢

8¢

Your change is:

8¢

Making Change: Counting Up

Buy:	Pay: $1.00	To make change start with the cost (34¢) and count up to the amount you paid ($1.00).
		

First use pennies to get 0 or 5 ones.

34¢ 

35 has 5 ones

35¢

Next add (N), (D), and/or (Q) to count up to the number you paid.

34¢ 

35¢ 40¢ 50¢ 75¢ $1.00

Stop! You reached the amount you paid!

Now count up the coins to find your change.

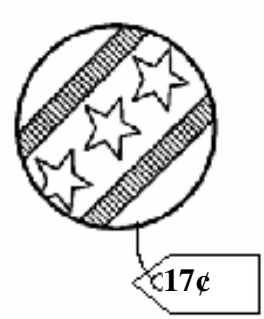
25¢ 50¢ 60¢ 65¢ 66¢

Your change is:

66¢

Making Change: Subtracting

Buy:



Pay: 25¢

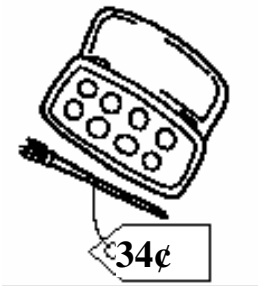
To make change subtract the amount the item costs (17¢) from what you paid (25¢)

$$\begin{array}{r} {\scriptstyle 1\ 15} \\ \cancel{25}\ ¢ \\ -\ 17\ ¢ \\ \hline 8¢ \end{array}$$

Your change is:

8¢

Buy:



Pay: $1.00

To make change subtract the amount the item costs (34¢) from what you paid ($1.00)

Warning!! Before subtracting, make sure both amounts are written in cents or dollars and cents notation!

$$\begin{array}{r} {\scriptstyle 9} \\ {\scriptstyle 0\ \cancel{1}0\ 10} \\ \cancel{100}\ ¢ \\ -\ 34\ ¢ \\ \hline 66¢ \end{array}$$

$$\begin{array}{r} {\scriptstyle 9} \\ {\scriptstyle 0\ \cancel{1}0\ 10} \\ \$\cancel{1}00 \\ -\ \$0.34 \\ \hline \$0.66 \end{array}$$

Your change is:

66¢

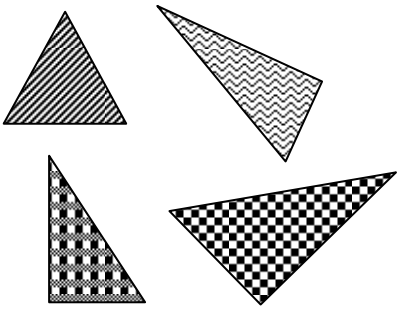
or $0.66

2D Shapes

Triangles

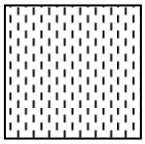
3 sides

3 vertices (corners)

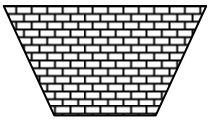


Quadrangles or Quadrilaterals

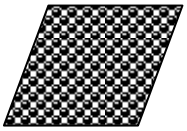
4 sides **4 vertices**



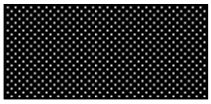
Square



trapezoid



Rhombus

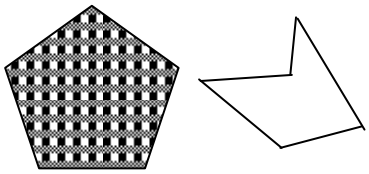


Rectangle

Pentagons

5 sides

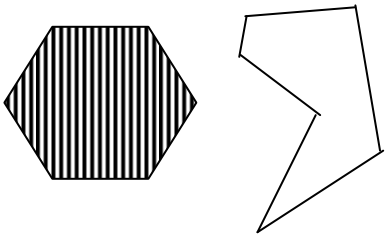
5 vertices



Hexagons

6 sides

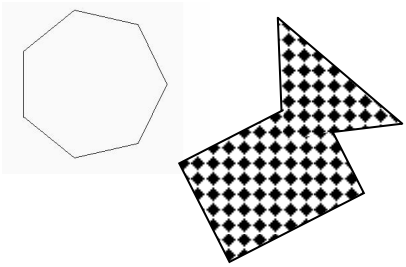
6 vertices



Heptagons

7 sides

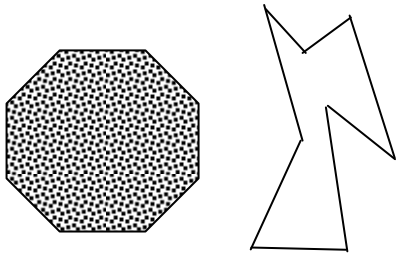
7 vertices



Octagons

8 sides

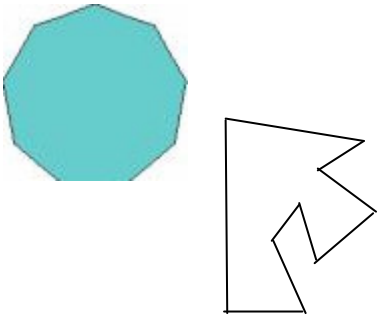
8 vertices



Nonagons

9 sides

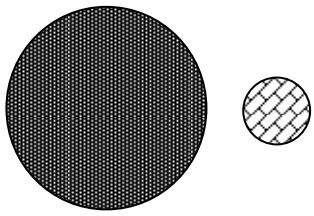
9 vertices



Circles

0 sides

0 vertices

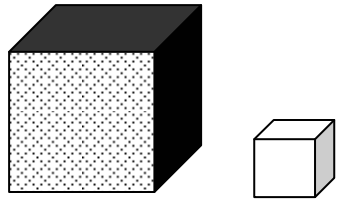


3D Shapes

Prisms

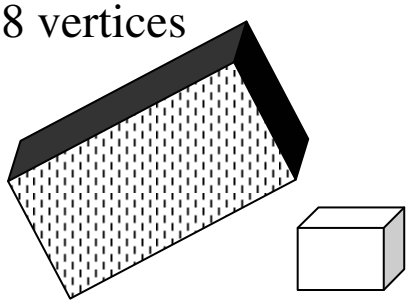
Cube

6 faces: squares
8 vertices (corners)



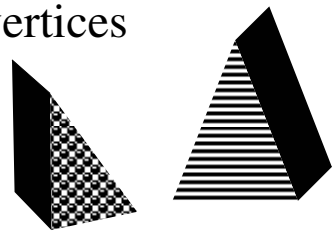
Rectangular Prism

6 faces: rectangles
8 vertices



Triangular Prism

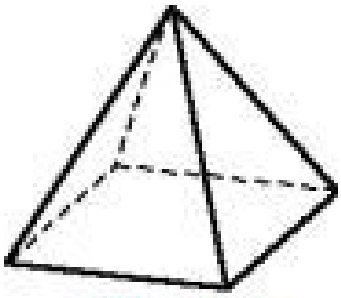
5 faces: 3 rectangles
2 triangles
6 vertices



Pyramids

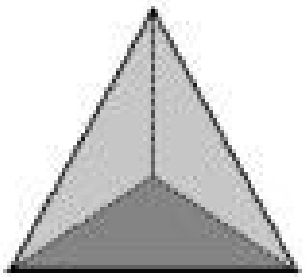
Square Pyramid

5 faces: 1 square & 4 triangles
5 vertices



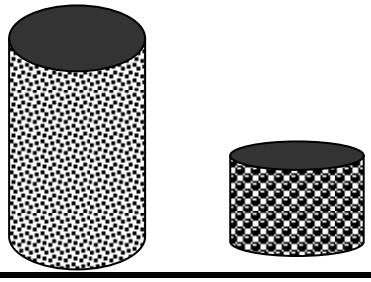
Triangular pyramid

4 faces: triangles
4 vertices



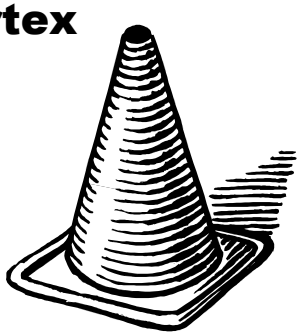
Cylinders

2 faces: circles
curved surface
0 vertices



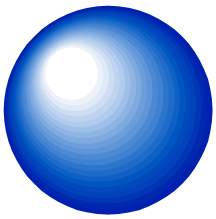
Cones

1 face: circle
curved surface
1 vertex



Spheres

Curved surface
0 vertices

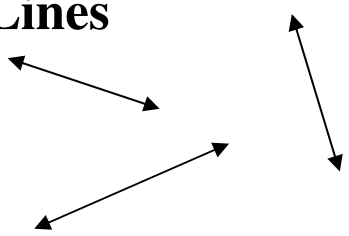


Units of Time

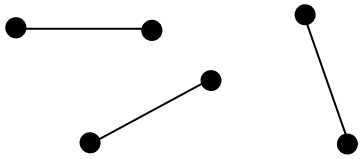
60 Seconds = 1 minute	7 days = 1 week
60 minutes = 1 hour	365 days = 1 year
24 hours = 1 day	12 months = 1 year

Lines

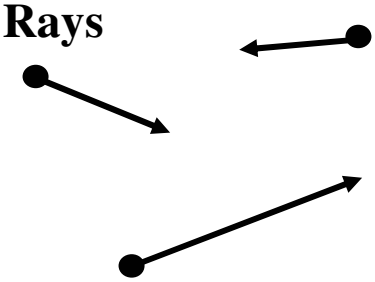
Lines



Line Segments



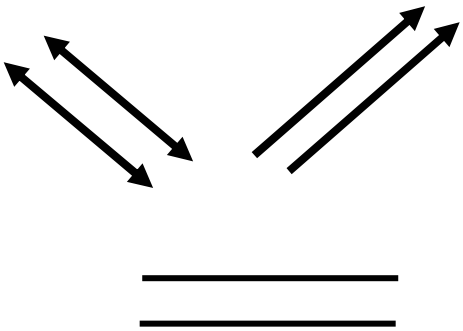
Rays



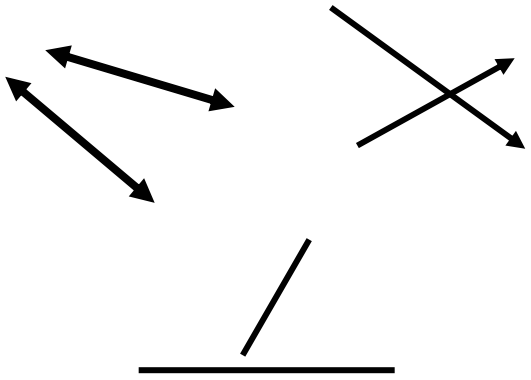
Parallel Lines

Parallel lines are lines that are always the same distance apart. Parallel lines will never meet. Imagine a railroad track that goes on forever. The two rails are parallel.

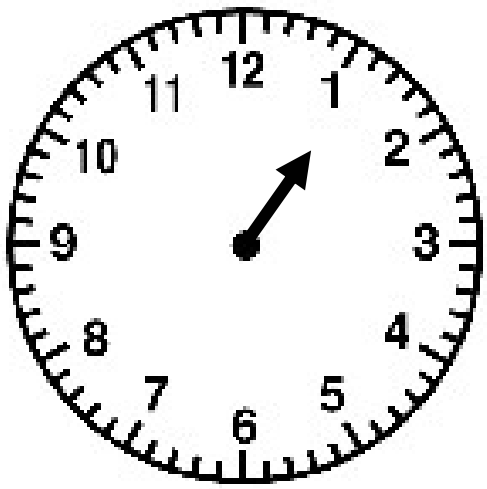
Parallel



Not Parallel

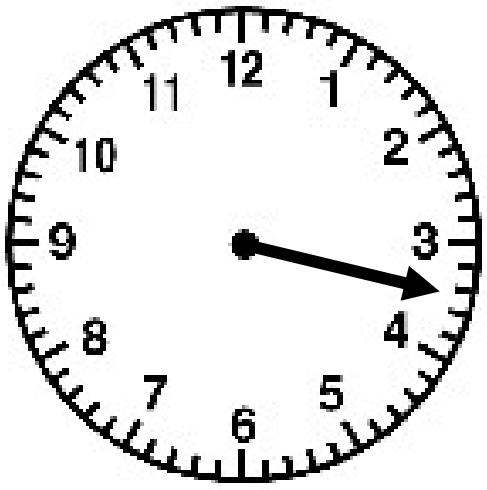


The Hour Hand



This is the hour hand. It is the short hand on the clock. It counts the hours. The numbers on the clock stand for the hours. The hour hand will go around the clock face two times each day. There are 24 hours in one day.

The Minute Hand

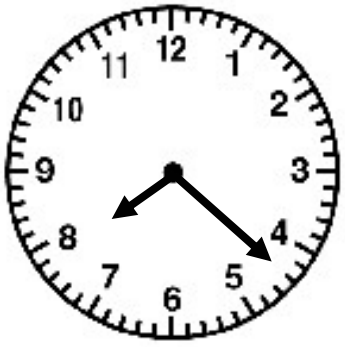


This is the minute hand. It is the long hand on the clock. It counts the minutes. Each line on the clock stands for a minute. There are five minutes between each number. The minute hand will go around the clock once in an hour. There are 60 minutes in one hour.

Telling Time

1. Read the hour (small) hand first. Read the number the hour hand is pointing to. If the hour hand is between two numbers, read the number behind the hour hand.

10: ____ ____

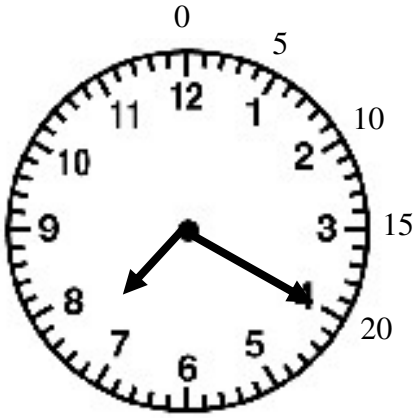


7: ____ ____

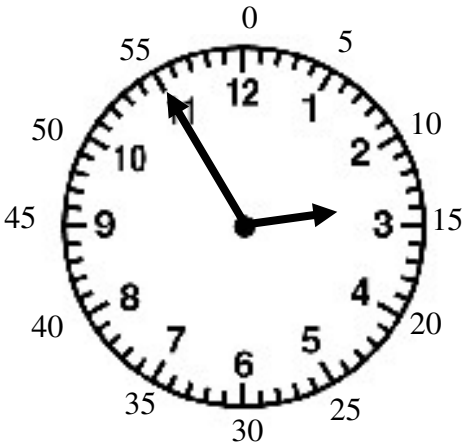
2: ____ ____

2. Now read the minute (long) hand. Count the 12 as zero and count by 5s for each number. Stop when you get to the minute hand.

10:00



7:20



2:55