# Math Computation Strategies

# MATH COMPUTATION

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Annual Goal: will improve his/her math computation skills a minimum of one year above his/her present level of functioning as measured by standardized and informal testing.

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Methods of Evaluation are on the following page.

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Possible Short Term Objectives Related to Annual Goal (specific/measurable):

1. will increase his/her speed in adding and subtracting math facts computation by applying strategies: counting on, partners of ten, doubles, near doubles, zero, 9's, near tens, finger math, count downs, adding 10's, neighbors (pg 1-5).
2. will increase his/her speed and accuracy in math facts (x & / ) by learning and applying finger math: multiplying by 9's, finger sets, Emphasis Strategy, rhymes, finger multiplication (pg 5-8).
3. will be introduced to the Multiplication Table Elimination to aid in learning the multiplication facts. (9-10)
4. will be introduced to and independently apply "Using Mnemonics in Math". (p.11)
5. will be introduced to and apply the BEDMAS strategy. (p.12)
6. will be introduced to and apply FOIL strategy. (p.12)
7. will be introduced to and apply Rangle Langle Dangle. (p.12)
8. will be introduced to "The Metric System in Easy Steps" (p.13)
9. will be introduced to the use of a calculator for checking computation.
10. will be taught how to change fractions to decimals in solving math problems. (when possible)
11. will increase his/her scores on daily mad minutes and weekly 5 minute math tests.
12. will be introduced to and use advanced computation cards.
13. will use Numero to increase basic computation skills (see teacher in-service binder).
14. will be encouraged to ask questions.

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** May combine computation goal with application goal when overall math testing is low. Short term objectives will be chosen from a combination of computation and application long term goals. **

The wording of this long term goal:

_____ will improve his/her math skills a minimum of one year above his/her present level of functioning as measured by standardized and informal testing.

Annual Goal: will improve his/her math computation skills a minimum of one year above his/her present level of functioning as measured by standardized and informal testing.

Method of Evaluation:

- daily mad minutes
- weekly 5 minute math tests
- standardized pre and post testing
- teacher observation
- daily work
- teacher made tests
- quizzes
- games

Short Term Objectives Related to Annual Goal (Specific/measurable)

1.

| Date | Teacher's Initials | Comments |
|---|---|---|
| | | |

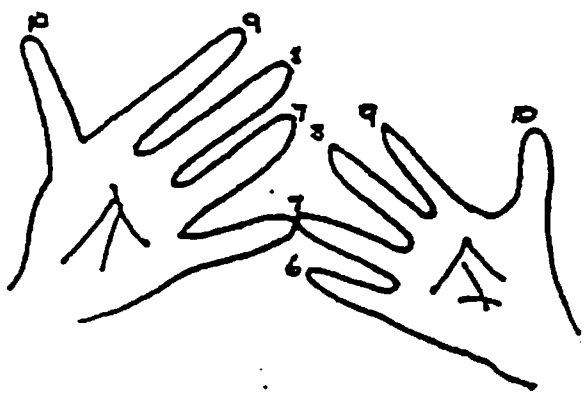
## 2. Rhymes

An additional strategy that may be used by children who have well-developed oral language skills, but trouble with rote recall, is rhyme or music. Flash cards are made for practicing any unknown facts. The problem and the first line of a poem are written on one side of the card, and the solution and the last line of the poem are written on the flip side. Cards are then appropriately illustrated. Students in a classroom may customize their cards by creating the rhymes and drawing the subsequent illustrations.

(1) 8 x 7 can be done with sticks, (2) until you know that it's 56.
(1) 8 x 4 forgot what to do, (2) so she called up number 32.
(1) 7 x 7 was never on time, (2) until he ran into Mr. 49.

Students enjoy creating rhymes, drawing the illustrations, and practicing the facts. Gradually the rhyme cards are faded out and regular flash cards used. Song lyrics that include several facts may also be created for a familiar tune. These types of mnemonic strategies may help some student to memorize facts.

## 3. Finger Multiplication (6's - 9's)



- the student's palms should be facing himself/herself
- touch fingers of opposite hands that correspond to factors
- any fingers touching and below are counted in tens
- the remaining fingers of each hand are added and then multiplied together

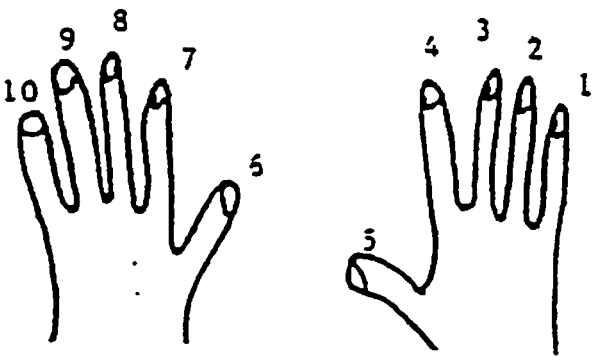
and then added to the amount of tens

Example: 7 x 7

- all fingers touching and below (4 fingers ) = 40
- remaining fingers on the left hand = 3
- remaining fingers on the right hand = 3
- multiply the numbers together - 3 x 3 = 9
- add the two amounts - 40 + 9 = 49

7 x 7 = 49

## 4. Multiplying By 9's




- student's hands are palms down on the desk
- use one finger as a counter to divide fingers into tens and ones
- fingers to the RIGHT of the counter finger are tens
- fingers to the LEFT of the counter finger are counted as ones
- do not count the dividing finger

Example: 9 x 3

- fold the middle (third) finger down on the right hand
- the two fingers to the right = 20
- there are seven (7) fingers to the left of the dividing finger

**BEDMAS strategy** is used when there are multiple operations to be completed in and equation.

This acronym represents in what order the operations must be completed.

B - the operations in **brackets** must be completed first
E - anything that is an **exponent** must be solved
D - **division** in then done next
M - **multiplication** is to be completed
A - **addition** is then completed
S - lastly **subtraction** is completed

**FOIL strategy** - is used when expanding binomials

It is also an acronym - First, Outer, Inner & Last

i.e. $(x - 3)(x + 4)$

First would be multiplying the first of each binomial - $(x \times x) = x^2$

Outer would be multiplying the outer of each binomial - $(x \times 4) = 4x$

Inner would be multiplying the inner of each binomial - $(-3 \times x) = -3x$

Last would be multiplying the last of each binomial - $(-3 \times 4) = -12$

**Rangle Langle Dangle strategy** - used when adding or subtracting fractions

Rangle refers to multiplying across to the right
Langle refers to multiplying across to the left
Dangle refers to multiplying your denomintors and finish off with adding the products of Rangle and Langle

$$\frac{1}{3} \overset{\nearrow \times}{\underset{\searrow \times}{+}} \frac{2}{4} = \frac{4 + 6}{12} = \frac{10}{12}$$

# Math Application, Basic Skills, & Problem Solving Strategies

## MATH APPLICATION, BASIC SKILLS, AND PROBLEM SOLVING

This goal is intended to help students improve their achievement in math (application, concepts, basic skills, and problem solving). This goal is to be updated by the student's math teacher.

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Annual Goal: will improve his/her ability to demonstrate his/her understanding of math concepts a minimum of one year above his/her present level of functioning as measured by standardized and informal testing. **(Hint: use this goal if math testing is high, but in class performance is low)**

Annual Goal: will improve his/her comprehension and math application skills a minimum of one year above his/her present level of functioning as measured by standardized and informal testing. **(Hint: use this goal if math concepts and application testing is low)**

Annual Goal: will increase problem solving skills a minimum of one year above his/her present level of functioning as measured by standardized and informal testing.

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** May combine computation goal with application goal when overall math testing is low. Short term objectives will be chosen from a combination of computation and application annual goals. **

The wording of this annual goal:

- will improve his/her math skills a minimum of one year above his/her present level of functioning as measured by standardized and informal testing.

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Methods of Evaluation are on the following page.

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Possible Short Term Objectives Related to Annual Goal (specific/measurable):

1. will be taught and be able to independently apply strategies for each new concept taught.
2. will score at a minimum level of 70% on each unit post-test. (the minimum standard may vary depending on the student's goals and abilities)
3. will complete guided practice questions at a minimum level of 70% correct. (the minimum standard may vary depending on the student's goals and abilities)
4. will complete independent practice questions at a minimum level of 70% correct. (the minimum standard may vary depending on the student's goals and abilities)
5. will complete corrections (with teacher assistance when necessary) to reinforce concepts taught.
6. will be encouraged to ask questions to facilitate a better understanding of math concepts.
7. will be taught and be able to independently use a "math journal" (p5 and 6).
8. will be able to restate the new concept using familiar terms.
9. will be introduced to and be able to independently organize their work so that it is easily understandable to the marker.
10. will be taught how to and be able to independently check their own work.
11. will be able to underline and highlight the key words in the problem.
12. will be able to use self-talk (or series of "self-statements") as a guide to systematic problem solving e.g. What's my problem?, What's my plan?, Am I using my plan?, How did I do?.
13. will be taught and be able to use the metacognitive self-questioning "Does my answer make sense?".

14. will be introduced to and be able to independently apply strategies for determining what process to use - concrete materials, making the number in the problem smaller, drawing a diagram - just combining (+), neatly combining (x), just separating (-), neatly separating (/).
15. will be taught how to study for math tests and use these strategies to study for unit and comprehensive math tests. (p7)

Problem solving specific:
will be introduced to and be able to independently apply a step-by-step problem solving strategy. (p1 to 4)
15. will be introduced to and be able to apply the "SMART" strategy for solving word problems. (p1)
16. will be introduced to and be able to apply the "IDEAL" strategy for solving word problems. (p2).
17. will be introduced to and be able to independently apply the eight steps to problem solving strategy. (p 4)
18. will be able to develop a plan to solve the problem.
19. will be able to accurately compute the problem and record the answer in a final sentence.
20. will be able to plan, monitor and check himself/herself while doing math word problem (refer to #12 above).

Annual Goal: will increase problem solving skills a minimum of one year above his/her present level of functioning as measured by standardized and informal testing.

Annual Goal: will improve his/her ability to demonstrate her understanding of math concepts a minimum of one year above his/her present level of functioning as measured by standardized and informal testing. **(Hint: use this goal if testing is high, but in class performance is low)**

Annual Goal: will improve his/her comprehension and math application skills a minimum of one year above his/her present level of functioning as measured by standardized and informal testing. **(Hint: use this goal if concepts and application testing is low)**

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Annual Goal: will improve his/her math skills a minimum of one year above his/her present level of functioning as measured by standardized and informal testing. **(combined computation and application annual goal)**

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Method of Evaluation:

- daily mad minutes
- weekly 5 minute math tests
- standardized pre and post testing
- teacher observation
- daily work
- teacher made tests
- unit tests
- quizzes
- games
- comprehensive exams

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Short Term Objectives Related to Annual Goal (Specific/measurable)

1.

| Date | Teacher's Initials | Comments |
|---|---|---|
| | | |

# Journals/Learning Logs

Journals/Learning Logs

Journals (or learning logs) are on-going written records, including graphics, which help you assess how students organize, formulate, internalize, explain and evaluate concepts and processes. Writing sends a message to students that the communication of their scientific and mathematical thoughts are important.

**Evaluation Purposes:**

- They provide insight about a student's level of understanding or use of process
- You can assess attitudes about math and science from writings about thoughts and feelings.
- They demonstrate a student's fluency in the communication of mathematical and scientific ideas.

**Reflective Log:**

Name:
Topic:

1) Key Ideas

2) Connections:

3) Questions:

**Thoughts:**

- Students with special needs have more time to process when they use a learning log.
- Respond to a student's writing. Feedback motivates them to continue to write.
- Students need lots of practice writing their ideas. They should get peer feedback to validate their writing and to see how their ideas affect others.
- Don't worry about the mechanics of the writing unless it's part of a final report or project.
- Encourage the use of drawings and symbols.

Have students practice writing ideas and getting peer feedback.

**Fraction Journal Entry:**

Fractions I know:

$\frac{1}{2}$ — — — —

How I have used fractions: (draw or write)

Learning Log
Name: Date:

| Problem | Work | Student Comments |
|---|---|---|
| | | Do I square everything first?<br><br>Oops, I got another negative<br><br>Help! |

**Types of Journal Entries:**

- Reports/products of an investigation or class activity
- Explanations of the processes used
- Responses to open-ended questions
- Definitions, concepts, and processes written in the students' own words
- Explanations of their own errors (self-correction)
- Expressions of their feelings about the learning experience
- Responses to errors of others
- Real-world examples
- Technology and society issues associated with a science topic
- Problem solving attempts
- Responses to teacher demonstrations

**Note Taking/Note Making:**

NOTE TAKING

What is multiplication?

*A simplified way to do repetitive addition.*

PICTURE MAKING

*6 x 5*

*six groups of five each*

NOTE MAKING

How would you cut a pan of brownies to feed 12 people?

Multiplication is:

# Strategies For Word Problems

## Purpose

- to assist the student to approach problems in an organized systematic way
- to control impulsive responding
- to encourage self-motivation

### 1. Fleishchner, Nuzum, and Marzola (1987)

| | |
|---|---|
| **READ** | What is the question? |
| **REREAD** | What is the necessary information? |
| **THINK** | Putting together? = Add |
| | Taking apart? = Subtract |
| **SOLVE** | Write the equation |
| **CHECK** | Recalculate |
| | Label |
| | Compare |

### 2. SMART

**S** = Set of goals
**M** = Make a plan
**A** = Attempt the plan
**R** = Review
**T** = Try Again

# Strategies for Content Areas

## CONTENT AREA

Annual Goal: will improve his/her comprehension of concepts in science to a 70% level.

-will improve his/her comprehension of concepts in biology to a 70% level.

- will improve his/her comprehension of concepts in physics to a 70% level.

- will improve his/her comprehension of concepts in social studies to a 70% level.

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Methods of Evaluation are on the following page.

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Possible Short Term Objectives Related to Annual Goal (specific/measurable)

1. will be introduced to and apply the "Concept or Unit Organizer" strategy. (p.1-4)
2. will be introduced to and apply the "Margin Monitoring" strategy. (p. 5)
3. will be introduced to and use "Selective Study Guides" to assist him/her in finding what is not important in reading materials. (p. 6)
4. will be introduced to and independently apply the "THRILD" strategy for previewing and reviewing a chapter. (p. 7)
5. will be introduced to and independently apply the "PARA-Point" strategy to find the main idea/important information in reading material. (p.7)
6. will be introduced to and use "ACID – marks" to interact with and better understand his/her reading materials. (p.7)
7. will be introduced to and independently use semantic mapping for note taking and to increase comprehension. (p.8)
8. will be introduced to and independently apply concept mapping. (p. 9)
9. will be introduced to and use the "TRAVEL" strategy to map ideas in reading material for better comprehension. (p.10)
10. will be introduced to the note-taking sequence. (p.11)
11. will be introduced to and apply BROIL. (p. 12)
12. will be introduced to and independently use the "Spilt Page Notes" strategy. (p. 13)
13. will be introduced to and independently use "Self-Questioning Symbols" (for 5WH) when reading materials. (p. 13)
14. will be introduced to and independently apply the TELLS strategy. (p. 14)
15. will be introduced to and independently apply RAP. (p. 14)
16. will be introduced to and independently apply RIDER. (p. 14)
17. will be introduced to and apply Textmapping. (p. 15)
18. will be introduced to and independently apply SQ3R. (p. 16-18)
19. will be introduced to and independently apply the "Peg System". (p. 19-22)
20. will be introduced to and independently apply "Give a Hand". (p. 23)
21. will be introduced to and independently apply $P^3$. (p. 24)
22. will be introduced to "From the Right Angle". (p.25-27)
23. will be introduced to Pictionary Vocabulary/ Concept Review. (p. 28)
24. will be introduced to Word Expert Cards. (p. 29-34)
25. will be introduced to and apply the reviewing technique of "Anything Goes" (p.35)
26. will be introduced to and apply the reviewing technique of "Connect Two" (p. 36-37)
27. will be introduced to and apply the reviewing technique of "Two in One" (p. 38)
28. will be introduced to and apply the reviewing technique of "Find That Word" (p. 39)
29. will be introduced how to do Internet searches in order to research topics covered in class. (p. 40)
30. will be introduced to an independent note taking sheet. (p. 41)
31. will be introduced to and independently use taped or CD recordings of books and other relevant reading materials.

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Annual Goal: will improve his/her comprehension of concepts in science to a 70% level.

-will improve his/her comprehension of concepts in biology to a 70% level.

- will improve his/her comprehension of concepts in physics to a 70% level.

- will improve his/her comprehension of concepts in social studies to a 70% level.

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Method of Evaluation:

- daily assignments
- quizzes
- exams
- teacher observation
- in-class discussions
- research reports
- games
- hands-on activities
- comprehensive exams

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Short Term Objectives Related to Annual Goal (Specific/measurable)

1.

| Date | Teacher's Initials | Comments |
|---|---|---|
| | | |

# The U. .t Organizer

BIGGER P' | IRE DATE

LAST UNIT/Experience

CURRENT UNIT

NEXT UNIT/Experience

UNIT SCHEDULE

UNIT MAP

is about...

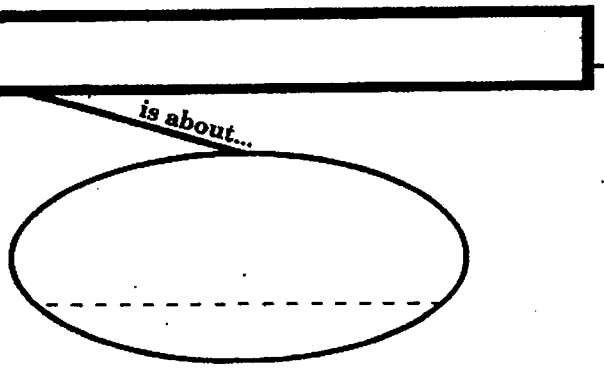
UNIT SELF-TEST QUESTIONS

UNIT RELATIONSHIPS

# The Unit Organizer

NAME _____
DATE _____

⑨ EXPANDED UNIT MAP




⑩ NEW UNIT SELF-TEST QUESTIONS

# The Unit Organizer

NAME Sharra Ti

DATE 9/18

④ BIGGER PICTURE

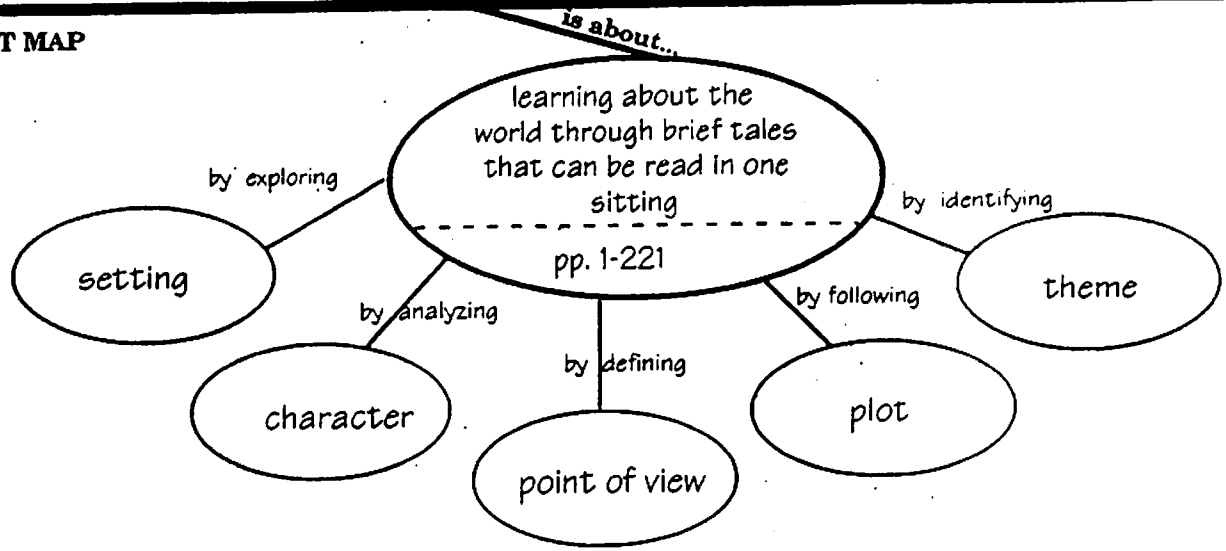
Types of Literature →

| ② LAST UNIT/Experience | ① CURRENT UNIT | ③ NEXT UNIT/Experience |
|---|---|---|
| Quality Writing | The Short Story | Drama |

## ⑧ UNIT SCHEDULE

| | |
|---|---|
| 9/19 | Concept Anchoring |
| 9/20 | Quiz on reading strategies |
| 9/27 | Portfolio presentation |
| 10/1 | Quiz on plot/character |
| 10/5 | Film on point of view |
| 10/8 | Project due |
| 10/12 | Point of view assignment |
| | |
| 10/15 | Portfolio presentation |
| 10/21 | Quiz on setting/theme |
| 10/24 | Short story due |
| 10/25 | Review |
| 10/27 | Short story analysis due |

## ⑤ UNIT MAP




## ⑦ UNIT SELF-TEST QUESTIONS

What makes a good short story?

How do short stories help us learn and think about the world?

[illegible] do you write a short story?

## ⑥ UNIT RELATIONSHIPS

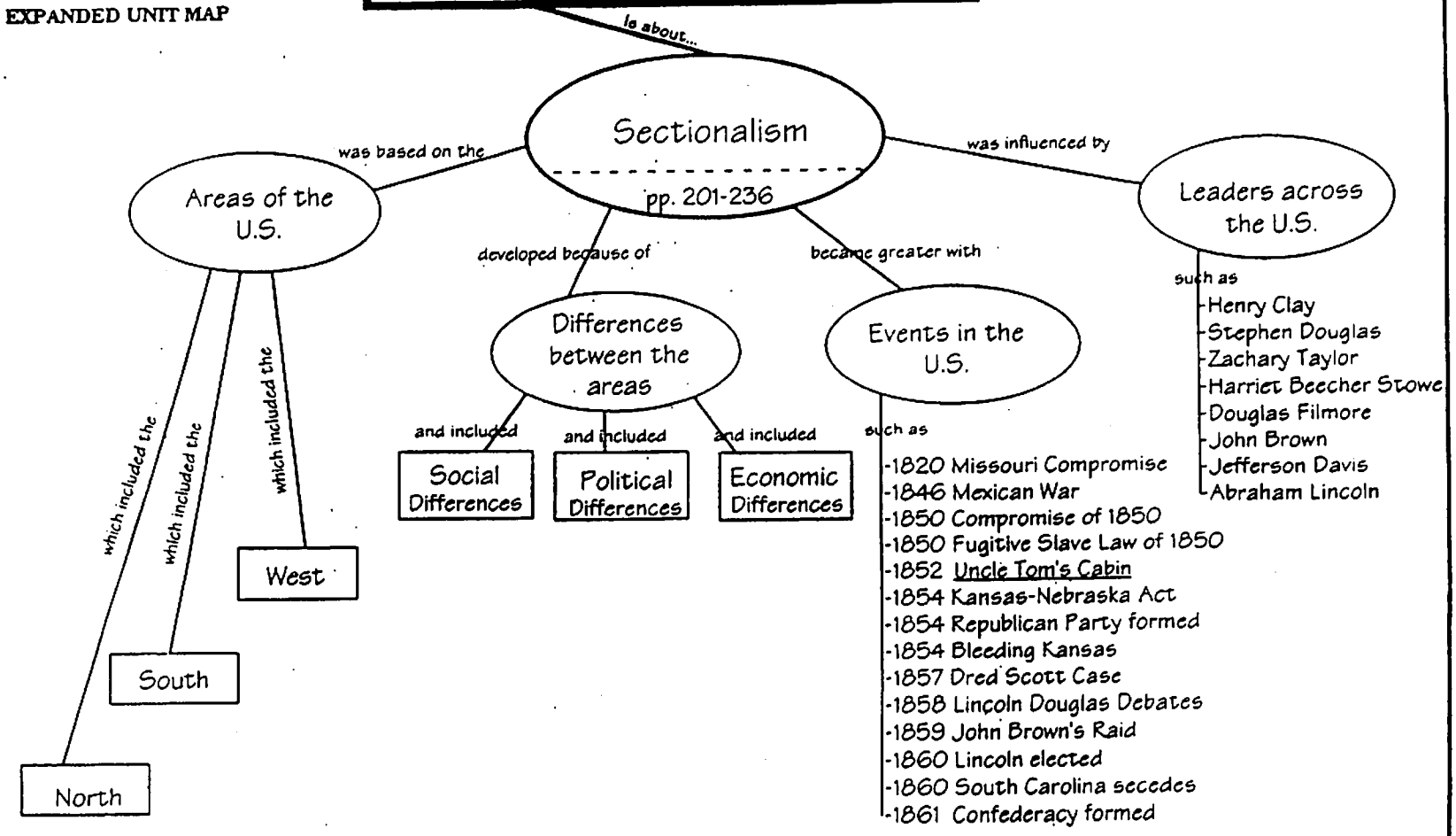
- cause/effect
- problem/solution
-
-

# The Unit Organizer

NAME Elida Cordora
DATE 1/22

## Causes of the Civil War

(9) EXPANDED UNIT MAP




(10) NEW UNIT SELF-TEST QUESTIONS

How did national events and leaders pull the different sections of the U.S. apart?

**The Problem**

1. The first step in comprehending a text is: the <u>decision</u> (deciding what to look for)

   - this takes almost no time and requires no special intelligence or abilities
   - most students (LD & non-LD alike) don't have any difficulty with this step

2. The 2nd step is: the <u>implementation</u> (looking)

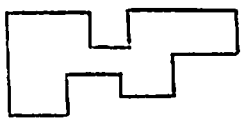
3. The 3rd step is: the <u>analysis</u> (making sense of the information that you have found)

   <u>Conclusion</u>: Students need more - and better - instruction and practice in <u>reading comprehension strategies</u> - <u>implementation</u>.

- Copy the chapter and tape each page together - tape on wall on newsprint.

1st - Box pictures - isolate them - use colored markers.

2nd - Text stream - another color marker
- i.e. everything that isn't a picture and not chapter review



3rd - Chapter Review (summary) - outline in another color

4th - Go through looking for questions
- marking the questions (often at the end of each little section) (same color as chapter review)

5th - Headings (*tell the kids about the meaning of different kinds of type) Bold, all capitals and subheadings, highlight the headings in a different color and in another color subheadings.

6th - Boxing the text for each heading (messy - is fine).

Note: You can cut out sections after you've marked it up and also put plastic over top and wipe it off.

- could color in maps too (interactive)

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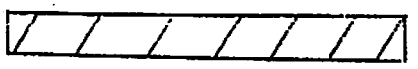
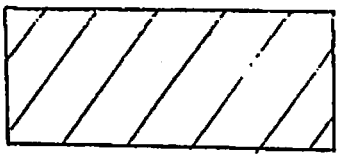
7th - Summary Review - look at the # of questions - compare to the # of sections - hypothesize

8th - read the 1st question
- find it (i.e. in intro)
- box question and box section - to be read later.





9th - Vocabulary - highlight the words when you find them

10th - Double-check

11th - Do questions

# Study Skills & Test Taking Strategies

## STUDY SKILLS

Annual Goal: will improve his/her study skills.

Methods of Evaluation are on the following page.

Possible Short Term Objectives Related to Annual Goal (specific/measurable):

1. will be introduced and independently apply "Force" – May the force be with you (p. 1)
2. will be introduced and independently apply multicolor highlighting (p. 1).
3. will be introduced and independently apply the "Peg System". (p. 2-5)
4. will be introduced and independently apply the "Unit Organizer". (p. 6-9)
5. will be introduced and independently apply "SQ3R". (p. 10-12)
6. will be taught how to make and use "Split Page Notes". (p. 13)
7. will be taught how to make and use "Study Cards" or Concept Cards". (i.e. flashcards)
8. will be introduced and independently apply the Highlight, Tape, Listen and Look strategy (HTL & L).- for auditory learners.
9. will be taught how to use "Selective Study Guides". (p. 14)
10. will be taught "Time Management" – breaking task into chunks and writing in homework book; prioritizing.
11. will be introduced and taught how to use "Partner Studying".
12. will be introduced and taught how to use RAP. (p. 15)
13. will be introduced and taught how to use paragraph diagramming and webbing.
14. will be taught how to use mnemonic devices – acronyms, rhymes, silly sentences etc.
15. will use a homework agenda or palm pilot to record test dates and plan study times in advance.
16. will be introduced to and independently apply "Give Me a Hand". (p. 16)
17. will be introduced to and independently apply the "Study Organizer". (p. 17-18)
18. will be introduced to and independently apply "Take a Chance – Predict Test Questions" (p. 19)
19. will be introduced to and independently apply "Study Tricks". (p. 20)
20. will be taught how to highlight and organize information into a web. (p. 21)
21. will be taught strategies for Long Term Retrieval. (p. 22-24)
22. will be introduced to and independently apply strategies on how to organize for a test. (p. 25)
23. will be introduced to and independently apply strategies on how to concentrate when studying. (p. 26-29)
24. will be introduced to and independently apply "Memory Mapping". (p. 30-31)
25. will be introduced to and independently apply "L.O.T.S.". (p. 32)
26. will be introduced to how to prepare for a skill based test. (p. 33)
27. will be introduced to how to prepare for a concept based test. (p. 34)
28. will be introduced to and independently apply "R.C.R.C." (p. 35)
29. will be introduced to and independently apply "S.C.R.A.M." (p. 36-37)
30. will be introduced to and independently apply the "Test Preparation" sheet. (p. 38)
31. will be introduced to hints for "Planning Study Time". (p.39)
32. will be introduced to and apply "Effective Habits for Effective Study". (p. 40)
33. will be introduced to "Using Memory Effectively". (p. 41-42)
34. will be introduced to and apply "M.U.R.D.E.R." (p. 43)
35. will be introduced to and apply "Index Study system". (p. 44-45)
36. will use a checklist to ensure their study area is conducive to learning. (p. 46)

For math study skills refer to pg. 7 in the math section.

** Other Options for wording of study skills long term goals

- will improve his/her study skills and homework completion.
- will improve his/her study skills and organization.
- will improve his/her study skills and test taking skills.

Short term objectives will be chosen from a combination of the two major long term goals.

Annual Goal: will improve his/her study skills.

Method of Evaluation:

- teacher made tests in all subjects
- quizzes in all subjects
- games i.e. jeopardy
- comprehensive exams
- parent/teacher communication
- study guides
- study calenders

Short Term Objectives Related to Annual Goal (Specific/measurable)

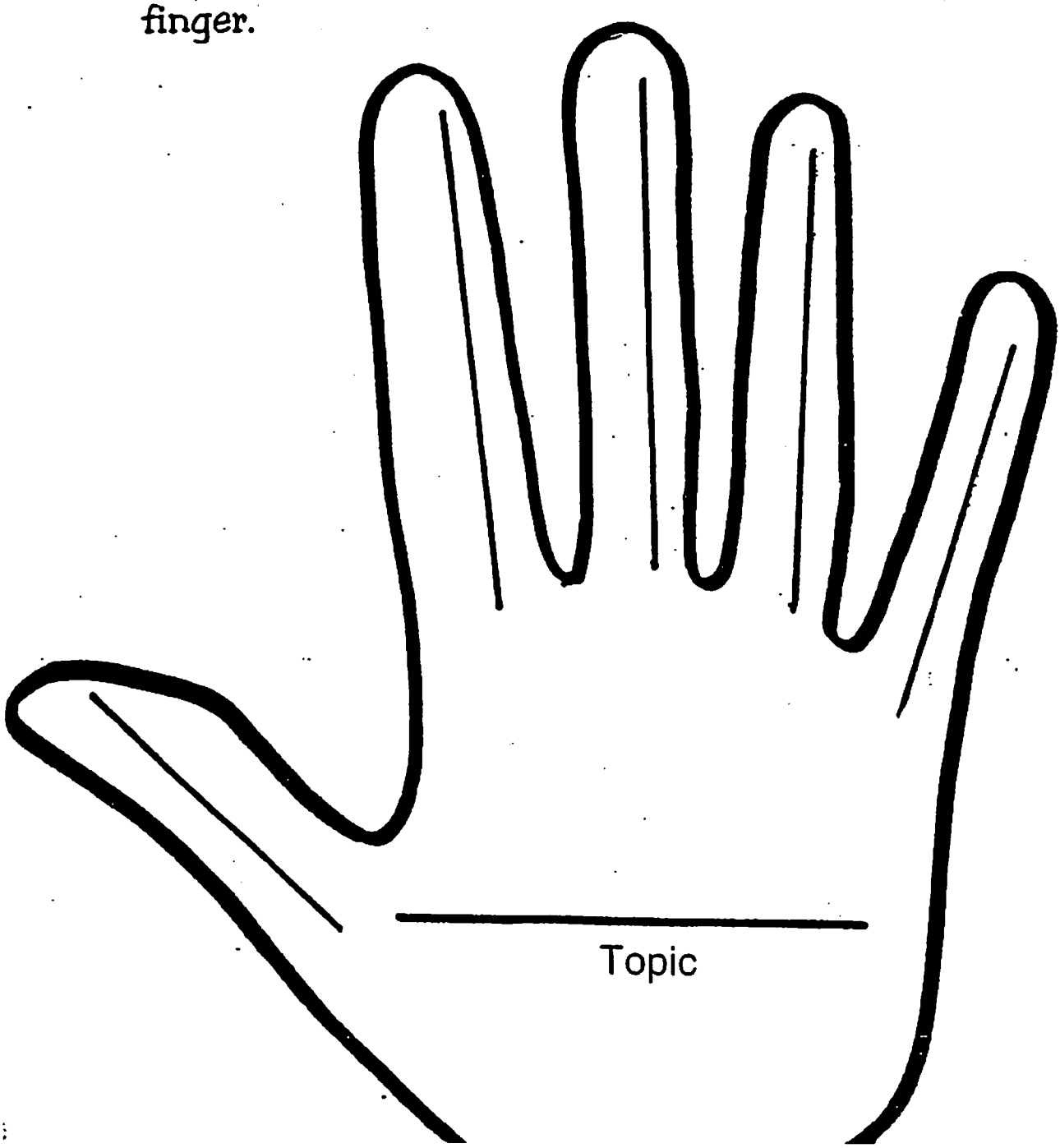
1.

| Date | Teacher's Initials | Comments |
|---|---|---|
| | | |

# Give Me A Hand

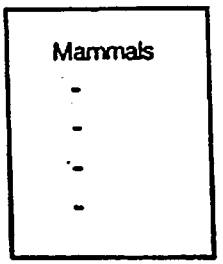
(remembering important ideas or facts)

- topic on the palm and each idea or important fact on a finger.



## Split Page Notes

- the student starts writing their notes about 1/3 of the way across the page.




- the left hand portion is used to draw pictures or write key words to trigger the content of the notes.
- when studying the student folds the page and self-tests using the key words and pictures as cues.

# Homework & Organization Strategies

## ORGANIZATION

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Annual Goal: will improve his/her organizational skills.

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Methods of Evaluation are on the following page.

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Possible Short Term Objectives Related to Annual Goal (specific/measurable):

1. will use E.A.'s organizational system i.e. binders sections, corrections folder, work to be handed in folder, fiddling box etc.
2. will place all of his/her corrected and teacher signed worksheets and handouts into his/her binder immediately after receiving them.
3. will come to each group/class prepared with all the needed materials (check board first or store material in that classroom).
4. will use a checklist at the beginning and end of each day to organize (job completed, homework ready, desk tidy).
5. will fill in homework into an agenda or palm pilot at the end of each class.
6. will use color coded binders or tabs for each subject.
7. will organize his/her work space.
8. will be able to learn and follow the daily classroom routines and schedule.
9. will clean and organize his/her desk and locker once a week.
10. will complete all corrections and filing in his/her corrections folder weekly. (p. 1)
11. will leave textbook after class with teacher– to ensure it is not lost.
12. will use a monthly calendar to record important dates, assignments and events. (p. 2)
13. will use a weekly time plan to record important dates, assignments and events. (p. 3)
14. will use a weekly assignment sheet to be able to prioritize and plan effectively. (p. 4)

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** Other Options for wording of organizational long term goals:

- will improve his/her organizational skills and homework completion.
- will improve his/her study skills and organization.

Short term objectives will be chosen from a combination of the two major long term goals.

Annual Goal: will improve his/her organizational skills.

Method of Evaluation:

- desk and locker checks
- teacher checklists
- student checklists
- self-evaluation
- teacher observation
- parent observation
- binder and folder checks
- use of homework book, clipboard agenda or palm pilot

Short Term Objectives Related to Annual Goal (Specific/measurable)

1.

| Date | Teacher's Initials | Comments |
|---|---|---|
| | | |