

MEASUREMENT

An Elementary Resource List

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Table of Contents:

- A. [Supporting Program Material](#)
- B. [Print Resources](#)
- C. [Manipulatives](#)
- D. [CD ROMs](#)
- E. [Web Sites](#)
- F. [Posters and Pictures](#)
- G. [Children's Literature](#)

A. Supporting Program Material

1. *Quest 2000 Exploring Mathematics*. (1996). Canada: Addison-Wesley Publishers Limited

Canada.

Series includes:

- Teacher's Guide and Journal
- Student workbook
- "Problem of the Week" Overhead Transparencies (1997)
- Teacher Support Package [Activity Masters, Assessment Masters, and Family Masters]
- Children's Literature Connections

2. *Interactions*. (1993). Ginn Publishing Canada, Inc.

Series includes:

- Teacher's Resource Binder
- Program Information Book
- Blackline Masters

- "See What I Can Do" Booklets
- Developmental Unit Booklets
- Investigation Unit Booklets
- Activity Cards

Measurement Topics:

- Area ~ Comparing, Symmetry, Patterning
- Length ~ Centimetre, Comparing/Ordering, Estimating, Measuring with non-standard units, Measuring with standard units, Metre.
- Mass ~ Comparing, Ordering, Estimating
- Perimeter ~ Estimating
- Size ~ Comparing/Ordering, Estimating
- Temperature ~ Comparing/Ordering, Estimating
- Time ~ Patterning, Estimation
- Volume ~ Comparing/Ordering

Summary:

- Excellent activities for children ~ activities are developmental, services is "teacher-friendly"
- Series is "teacher-friendly"
- Outlines provided of sub-topics and concepts explored within each activity
- Provides references to related children's literature

[Back to Table of Contents](#)

B. Print Resources

1. *Gage: Active Mathematics*. (1992). Canada: Gage Education Publishing Company

Series includes:

a) Teacher Resource Binder:

- includes ideas for lessons, games and other activities that have children interacting with measurement in their everyday lives.
- activities are very experiential - a lot of hands-on, active mathematics as well as extension activities with open-ended questions.
- suggested children's literature, manipulatives, and materials for each topic.
- easy-to-read, "teacher-friendly", pictures and quotes surround the pages.
- assessment and evaluation techniques provided.

b) Big Books:

- colorful pages, activities for children to interact with, questions, split up by topics for easy recognition.

c) Blackline Master:

- could be used to supplement learning experiences, further investigations, have students document their learning.

d) Student Profile Book:

- provides a variety of measurement activities for children to practice and includes spaces for writing, drawing, and providing mathematical equations.

e) Investigation Book:

- colorful book with problem-solving pictures of measurement problems.

f) Activity Cards:

- 50 durable and easy-to-handle activity cards with excellent ideas and hands-on activities.

2. *SAIL Through Mathematics: Structured activities for intelligent learning. An elementary school resource book* by Richard Skemp.

Measurement topics:

- [Meas 1] Length
- [Meas 2] Area
- [Meas 3] Volume and Capacity
- [Meas 4] Mass and Weight
- [Meas 5] Time
- [Meas 6] Temperature

- There are two volumes of Skemp activities: Volume 1 and 1a: (Grades 1 - 3)

Volume 2 and 2a: (Grades 4 - 6)

Summary:

- A number of activities are described in-depth; including specific concepts, abilities, material, what the students do, discussion of activities.
- An "observe and listen, reflect, discuss" section.
- The volume books include blackline masters so the teacher can make each activity.
- An excellent teaching series to supplement any Elementary mathematics program.

3. *Communicating with color tiles: Primary.* (1993). Dr. William J. Masalski.

- This resource contains a number of different activities involving color tiles in the classroom. There are specific activities involving linear measurement with color tiles, estimation and area.

4. *Exploring with color tiles: Grades K-3.* (1990). Judi Magarian-Gold and Sandra Mogensen.

- Unit 7 explores estimation and measurement. A variety of activities are provided including cooperative group work and game suggestions

5. *Pattern Blocks with Primary Grades: Grades K-3 - Active learning series .* (1992). Lynda Bowen and Grant Jones.

- Sections 3 and 4 of this book deal with perimeter and area. The activities use patten blocks, problem solving and estimation.

6. *Tangrams in Action: K-4.* (1992). Learning Resources.

- This resource involves manipulating tangram pieces to work with area. The book focuses on a "Think-Show and Share" concept.

7. *The show and tell geoboard collection - Grades 2-4 and Grades 4-6.* Julian D'Angela.

- This resource includes activities involving measurement and geoboards. Activities look at area and perimeter. Some suggestions involve the students using predetermined units of measurement and others involve the students in creating their own shapes with guidelines of area or perimeter measurement.

[Back to Table of Contents](#)

C. Manipulatives

Type of Manipulative	Manufacturer
<ul style="list-style-type: none"> ● Cubical Counting Blocks ● Impuzzables ● Geometry Template ● Geo Blocks ● Tangrams ● Color Tiles ● Geo Boards ● Pentominoes ● Cuisenaire Rods ● Attribute Blocks ● Unifix Blocks ● Multi-Base blocks ● Base Ten Blocks ● Sorting/Counting Trays ● Tape Measures ● Miras 	<ul style="list-style-type: none"> ● Ideal School Supplies Co., IL ● Lakeside Industries, MN ● Exclusive Co. ● Exclusive Co. ● Exclusive Co. ● Cuisenaire Co. Of America ● Exclusive Co. ● Creative Publications, CA ● Cuisenaire Co. Of America ● Creative Publications, CA ● Didax Educational Resources, MA ● Exclusive Co. ● Exclusive Co. ● Exclusive Co. ● Exclusive Co. ● Exclusive Co.

[Back to Table of Contents](#)

D. CD-ROMs

1. *Math concepts and skills: Building essential concepts, skills, and strategies.* Computer Curriculum Corporation. Suitable for Grades K-8.

- Covers strategies, concepts, and skills that students need to have in order to progress in their understanding of math ideas.
- Offers students instruction, but also provides support to individual students by detecting their needs and responding with appropriate tutorials.
- Created to meet the needs of students in all areas of mathematics.

2. *Math finder.* Suitable for Grades K-6.

- Provides teachers and students with numerous lessons and activities to explore and work with when

examining the various strands of mathematics.

3. *Real-world math: Adventures in flight*. Addison-Wesley. Suitable for Grades 4-8.

- Helps students explore real world settings in an open-ended, exploratory manner which facilitates a better understanding of the different ways math applies to daily life.
- Concepts from six major strands of mathematics are explored.

4. *Timetown*. Steck-Vaughn Interactive Learning. Suitable for Grades K-6.

- Teaches children how to tell time by presenting everyday situations requiring time-telling skills.
- Instruction provided on concepts such as dates, days of the week, weeks in the month, hours, minutes, digital time, and critical thinking skills.
- Provides a Management/Tracking features so teachers can track each student's progress and assign lessons.

[Back to Table of Contents](#)

E. Audio/Visual Resources

1. *Windows on math (Units 1-10, Vol. 3)*. (1996). [Video Disk] Optical Data Corporation, NJ. Suitable for Grades K-6.

- Teachers use the latest technology, the video disk, to help students learn about length and area while modeling and encouraging students to see and explore what the video disk has to offer.
- This method of instruction encourages students to become involved in math class and facilitates technology literacy.

2. *How long? How far?* [Video] Available from Media House Publications, Regina, SK. [Catalogue No. V981] Suitable for Grades 3-7.

- A 25-minute video which focuses on measurement.
- Students look at ways to use tools when measuring length.
- Students also learn to identify and use various standard and non-standard units of measure.

3. *How much? How long?* [Video] Available from Media House Publications, Regina, SK. [Catalogue No. V9819]. Suitable for Grades 3-7.

- A 25-minute video focusing on measurement (weight).
- Students learn to use non-standard measures to solve practical problems, understand approximations, invent a method for determining how many, and finding an equivalence in "how much".

4. *How much does it hold?* [Video]. Available from Media House Publications, Regina, SK. [Catalogue No. V9820]. Suitable for Grades 3-7.

- A 25-minute video focusing on measurement (volume)
- Students look at the attributes of volumes, making and using volume estimations, and finding items that are clearly bigger/smaller than a given volume.

5. *Measured loaf*. [Video]. Available from Media House Publications, Regina, SK. [Catalogue No. V182]. Suitable for Grades 1-5.

- A 14-minute video demonstrating how to measure mass in different ways.

- Models the correct use of measuring instruments.
- Supporting print material available at the Book Bureau

6. *Measurement: The difference between perimeter and area*. [Video]. Available from Media House Publications, Regina, SK. [Catalogue No. V2478]. Suitable for Grades 1-5.

- A 14-minute video exploring and examining perimeter measures, boundary in linear units, areas measuring the region inside a boundary in square units.
- Supporting print material available at the Book Bureau.

7. *All star elf*. [Video]. Available from Media House Publications, Regina, SK. [Catalogue No. V9133]. 15 minutes. Suitable for Grades 1-2.

8. *Big business*. [Video]. Available from Media House Publications, Regina, SK. [Catalogue No. V9143]. 15 minutes. Suitable for Grades 2-3.

9. *Measurements*. [Video]. Available from Media House Publications, Regina, SK. [Catalogue No. V9357]. 26 minutes. Suitable for Grades 2-6.

10. *Super gnome*. [Video]. Available from Media House Publications, Regina, SK. [Catalogue No. V9147]. 15 minutes. Suitable for Grades 2-3.

[Back to Table of Contents](#)

F. Web Sites

1. [The mathematics hotlist at the Franklin Institute](http://sln.fi.edu/tfi/hotlists/math.html) (<http://sln.fi.edu/tfi/hotlists/math.html>)

- Provides a list titled "General Mathematics" which includes 53 links to different sites that cover a variety of math topics.
- Provides lesson ideas, class activities and games, and resource information.
- *Dr. Math*, a site where questions are asked and answered about a wide range of math topics can be found on the hotlist.

2. gopher://bvsd.k12.co.us:70/00/Educational Resources/Lesson_Plans/Big%20Sky/math/

CECmath.39

- Contains a lesson plan titled *Area and volume* by Timothy Welch of Greenwood Elementary School. This lesson provides students with hands-on activities to help them understand the concepts of area and volume by constructing models.

3. gopher://bvsd.k12.co.us:70/00/Educational Resources/Lesson_Plans/Big%20Sky/math/

CECmath.11

- Provides an examples of a lesson plan involving measurement called *Smile metric system*.
- An active lesson allowing students to practice working with the metric system by measuring the smiles of classmates and graphing the results.

4. <http://www.luc.edu/schools/education/csimath/mathact.htm>

- Provides 55 examples of math lesson plans and activities that can be used at the elementary level.

- Ideas are categorized under a variety of strands, including Measurement and Geometry.
- Includes a list of additional resources.

5. <http://www.clarityconnect.com/webpages/terri/terri.html>

- Designed for new Math teachers looking for ideas about what and how to teach.
- Provides ideas for lesson plans in a variety of areas.
- Suggests ways to integrate multicultural awareness in the mathematics class.
- Suggests classroom management techniques.

[Back to Table of Contents](#)

F. Pictures and Posters

1. Learning Works, located in Regina, SK., stocks a variety of different posters and charts. One good package suitable for Elementary and/or Middle years teachers is a package containing various posters showing all the different topics of measurement.

2. The Education Library at the University of Regina houses a variety of Measurement posters and pictures:

a) Large pictures - include a number of posters on the metric system. Most of these pictures are older and many of them are not very good but there are a few that will be useful to both Elementary and Middle years teachers. There are also some posters available on temperature. Many of the posters show different seasons and weather but there are some large posters of thermometers that may be of use to teachers. The posters on time will not be useful for math classes as they only show time zone maps of different areas.

b) The Picture File Collection [File cabinet] - there is a lot of materials on the metric system. There are over 50 different posters and pictures, many of which will be useful to a variety of different age groups. There is also a large package on the topic of money. These pictures show different types of money, people spending money and show different uses for money. The pictures are old but they may be useful in younger grades.

[Back to Table of Contents](#)

G. Children's Literature

1. Adler, D.A. (1975). *3D, 2D, 1D*. Thomas Y. Crowell Company, NY.

- With the use of simple experiments, this book explains the principle of dimensions and how they are measured.

2. Allington, R., & Krull, K. (1983). *Beginning to learn about measuring*. Raintree Childrens' Books.

- An introduction to measurement and the use of standard and non-standard units. Real life examples and activities are used to enable children to relate to the concepts.

3. Arnold, C. (1984) *Measurements - Fun, fact, and activities*. Franklin Watts, NY.

- An explanation of how things are measured, with directions for making counting sticks, growth charts, sand-clock timers, water-glass chimes, and other project.

4. Behrens, J. (1975). *The true book of metric measurement*. Childrens' Press: Chicago, IL.

- An easy-to-read history of the metric system and an explanation of the different units.
5. Branley, F. M. *How little and how much: A book about scales* . Thomas Y. Crowell Co.: NY.
- A brief introduction to the use of scales to measure things, with an emphasis on scales used to measure length and temperature.
6. Branley, F.M. (1975). *Measure with metric* . Thomas Y. Crowell Co.: NY.
- An introduction to measurement using the metric system through the use of simple experiments.
7. Dodge, B.S. (1972). *Big is so big* . Coward, McCann & Geoghegan, Inc.: NY.
- An introduction to the concepts of big, length, and area.
8. Hughes, S. (1986). *All shapes and sizes* . Lothrop, Lee & Shepard Books: NY.
- This book contains a rhyming text which describes how familiar things come in varying shapes and sizes.
9. Matthieas, M., & Thiessen, D. *The wonderful world of mathematics* . National Council of Teacher of Mathematics.
- A critically annotated list of children's books in mathematics - covering a wide variety of topics. A few of the key examples from this book include:

a) Adams, P. *Ten Beads Tall*. Child's Play: Sudbury, MA.

This book allows children to explore measurement with non-standard units using a string of ten beads which come attached to the book. The students can make size comparisons of the different objects presented on each page.

b) Allington, R. L. (1979) *Opposites*. Raintree Publications: Milwaukee, WI.

This book deals with the basic measurement concepts such as big and little, far and near, and tall and short. The book is explicitly illustrated and is appropriate for young children.

c) Greenfield, E. (1991) *Big friend, little friend* . Black Butterfly Children's Books: NY.

This book uses everyday situations and experiences to compare and contrast the concepts of "big and little". The use of situations which students can relate to will aid in their understanding of the concept as well as help them to become aware of the size of things in their environment.

d) *It is larger? Is it smaller?* (1985). Greenwillow Books: NY.

This book uses real-life examples to reinforce the concepts of larger and smaller.

e) *My first look at sizes* . (1990). Random House: NY.

Comparisons and sequencing are the main focus of this book. Once again real-life photos and examples are used to reinforce the concepts.

f) Pety, K., & Kopper, L. (1987). *What's that size?* Franklin Watts: NY.

A group of friends visit the zoo and are given the opportunity to explore the ideas of big and tall, fat and thin,

long and short, small and tiny, and same size.

g) Youlton, G. (1982). *Sizes* . Franklin Watts: NY.

The concept of size is introduced through unique design and vibrant color. Various animals are portrayed twice, however each time the animal grows and is then compared to something even bigger.

10. Podendorf, I. (1971). *How big is a stick ?* Childrens' Press: Chicago, IL.

- This book introduces the concepts of length and area using sticks as a focal point for the examples.

11. Spodendorf, K. (1970). *Many is how many ?* Children's Press: Chicago, IL.

- Deals with the process of measuring and the concepts of few, many, lot, big, small, long, and short.

12. Schwartz, D.M. (1985). *How much is a million ?* Scholastic Inc.: NY.

- This book is designed to help students understand the size of numbers. It uses examples, which are easily related to by students, in order to exemplify large numbers.

13. Shapp, M., & Shapp, C. *Let's find out what's big and what's small* . Franklin Watts, Inc.: NY.

- A simple book dealing with the concepts of big and small.

14. Srivastava, J. J. (1974). *Area* . Thomas Y. Crowell Co.: NY.

- This book provides an explanation of area and provides a wide range of real-life activities and examples.

Other Children's Literature:

TITLE	AUTHOR	FOCUS
1. <i>The 329th friend</i>	Marjorie Sharmat	-measuring the width, length, etc., of potatoes
2. <i>Something absolutely enormous</i>	Margaret Wild	-weight and length of yarn
3. <i>Paul Bunyan</i>	Steven Kellogg	-compare size of baby Paul to self as baby and to other objects in the environment.
4. <i>Out for the count</i>	Kathryn Cane	-measure length of pythons
5. <i>Jacob two-toe and the dinosaur</i>	Mordecai Richler	-measure length and size of dinosaur, compare to objects in the school
6. <i>Frank and Zelda</i>	Maryann Kovalski	-measure width, length, etc., of world's largest pizza.
7. <i>Charlie and the chocolate factory</i>	Unknown	-measure height of Oompa-Loompas -comparison to other objects -explore full height and half height
8. <i>Alexander who used to be rich last Sunday</i>	Judith Viorst	-time
9. <i>Slower than a snail</i>	Anne Schreiber	-non-standard units of measurement
10. <i>The biggest fish</i>	Sheila Keenam	-standard form of comparison and measurement