Process Standards Rubric

Algebra

Exercise columns: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 · Drill Sheet 1 · Drill Sheet 2 · Review A · Review B · Review C

Expectations
Instructional programs from pre-kindergarten through grade 12 should enable all students to:

GOAL 1: Problem Solving
- build new mathematical knowledge through problem solving;
- solve problems that arise in mathematics and in other contexts;
- apply and adapt a variety of appropriate strategies to solve problems;
- monitor and reflect on the process of mathematical problem solving.

GOAL 2: Reasoning & Proof
- recognize reasoning and proof as fundamental aspects of mathematics;
- make and investigate mathematical conjectures;
- develop and evaluate mathematical arguments and proofs;
- select and use various types of reasoning and methods of proof.

GOAL 3: Communication
- organize and consolidate their mathematical thinking through communication;
- communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
- analyze and evaluate the mathematical thinking and strategies of others;
- use the language of mathematics to express mathematical ideas precisely.

GOAL 4: Connections
- recognize and use connections among mathematical ideas;
- understand how mathematical ideas interconnect and build on one another to produce a coherent whole;
- recognize and apply mathematics in contexts outside of mathematics.

GOAL 5: Representation
- create and use representations to organize, record, and communicate mathematical ideas;
- select, apply, and translate among mathematical representations to solve problems;
- use representations to model and interpret physical, social, and mathematical phenomena.

(Rubric grid cells are marked with checkmarks across the Exercise, Drill Sheet, and Review columns.)
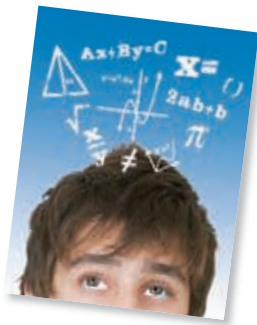
Teacher Guide

Our resource has been created for ease of use by both
TEACHERS *and* **STUDENTS** *alike.*

Introduction

Our resource offers ready-to-use worksheet activities for students in grades six to eight. *Math concepts outlined by the NCTM are presented in a way that encourages students to learn and review important concepts. Our resource can be used effectively for whole-class, small group and independent work. This book's exercises vary in difficulty and content so as to provide teachers and students with a variety of teaching and learning opportunities. Included are opportunities for problem-solving, sorting, patterning, algebraic graphing, solving equations and examining quantitative change. Visual models are included to assist visual learners. Teachers may also choose to use mathematics manipulatives along with the exercises included in this book to help address the needs of kinesthetic learners.*

Contained in this booklet are 18 Task Sheets, featuring real-life problem-solving opportunities; 2 drill sheets; review sheets for grades 6 – 8. As well, there are three overheads and 6 additional worksheets which can be accessed on the publisher's website.

How Is Our Resource Organized?

STUDENT HANDOUTS

Reproducible **task sheets** and **drill sheets** make up the majority of our resource.

The **task sheets** contain challenging problem-solving tasks, many centered around 'real-world' ideas or problems, which push the boundaries of critical thought and demonstrate to students why mathematics is important and applicable in the real world. It is not expected that all activities will be used, but are offered for variety and flexibility in teaching and assessment. Many of the task sheet problems offer space for reflection, and

opportunity for the appropriate use of technology, as encouraged by the *NCTM's Principles & Standards for School Mathematics.*

The **drill sheets** are provided to help students with their procedural proficiency skills, as emphasized by the *NCTM's Curriculum Focal Points.*

The **NCTM Content Standards Assessment Rubric** (*page 4*) is a useful tool for evaluating work in many of the activities in our resource. The **Reviews** (*pages 24-26*) are divided by grade and can be used for a follow-up review or assessment at the completion of the unit.

PICTURE CUES

This resource contains three main types of pages, each with a different purpose and use. A **Picture Cue** at the top of each page shows, at a glance, what the page is for.

Teacher Guide
• Information and tools for the teacher

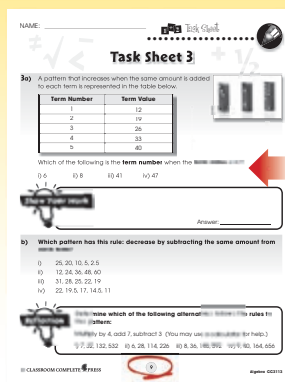**Student Handout**
• Reproducible worksheets and activities

Easy Marking™ Answer Key
• Answers for student activities

EASY MARKING™ ANSWER KEY

Marking students' worksheets is fast and easy with this **Answer Key**. Answers are listed in columns – just line up the column with its corresponding worksheet, as shown, and see how every question matches up with its answer!
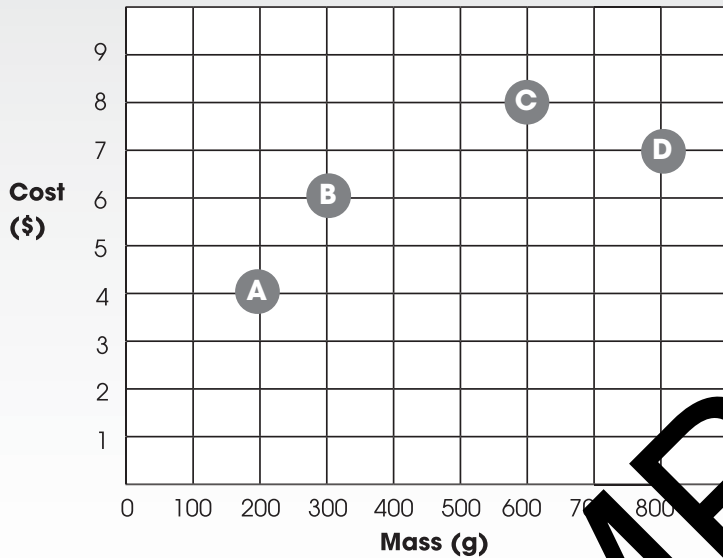
Every question matches up with its answer!
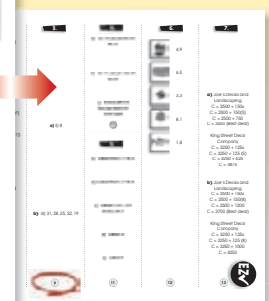
Task Sheet 8

8)   The following graph shows the relationship between the mass and cost of four different brands of maple syrup.

Cost ($)

9
8   C
7   D
6   B
5
4   A
3
2
1

0   100 200 300 400 500 600 700 800

Mass (g)

SAMPLE

Which statement is true?

a)   **Brand A has the lowest cost.**   Yes [ ]   No [ ]

b)   **Brand B has the smallest mass.**   Yes [ ]   No [ ]

c)   **Brand C has the highest cost per gram.**

Show Your Work

Yes [ ]   No [ ]

Explore With Technology

Visit the website http://www.cut-the-knot.org, and experience challenging and interactive algebraic problems.

Click on the different activities listed under the Algebra section. See how many problems you can solve.

Task Sheet 10

What's the Meaning of this?

10a) If Joanne can buy C **chocolate bars at .80¢ each and** B **butter tarts at .50¢ each, what is the meaning of:**
(Show your work.)

i) C + B

ii)   25C

iii) 20B

iv) 25C + 20B

b)   If Joanne buys D **donuts at .?0¢ each and** P **potato chips at .75¢ per bag, what is the meaning of:**

i) 2D + 4P

ii)   17P

iii) D/2

iv) 12D + 10P

Reflection

If x = 1.20 and y = 1.40, predict which of the following equations would equal the highest and lowest values.

i) 5x + 5y   ii) 10x   iii) 10y   iv) xy

Now, solve each equation to see if you were right.