Process Standards Rubric

Data Analysis and Probability

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

Teacher Guide

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

Introduction

Through multiple intelligence and a multi-disciplinary approach, this book engages students in meaningful learning activities that enhance their understanding of the concepts outlined by the NCTM. Students who are logical/mathematical can explain orally the processes they used, those who are visual learners can draw their understandings, those who are bodily-kinesthetic can use manipulatives, those with good interpersonal skills can talk about their understandings, and those who are linguistic can write about their knowledge of the topic. Each activity provides teachers with the opportunity to reinforce skills and extend student learning through additional exposure with varying levels of difficulty within each topic. Each activity can be used as a formative assessment tool to inform teachers and students about the progress students are making in the understanding of a particular concept. Rubrics are provided for teachers as an assessment tool and for students to engage in self assessment.

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.

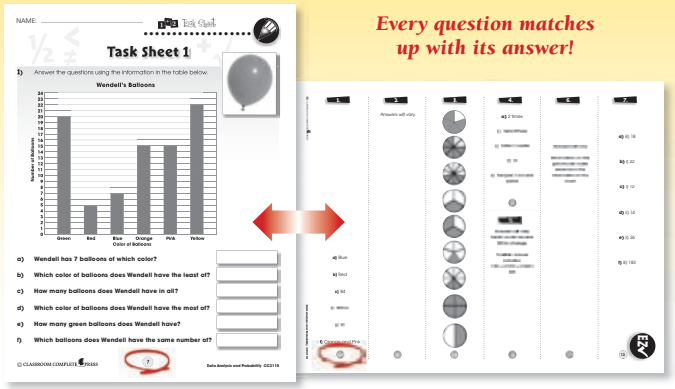
Teacher Guide
- Information and tools for the teacher

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!

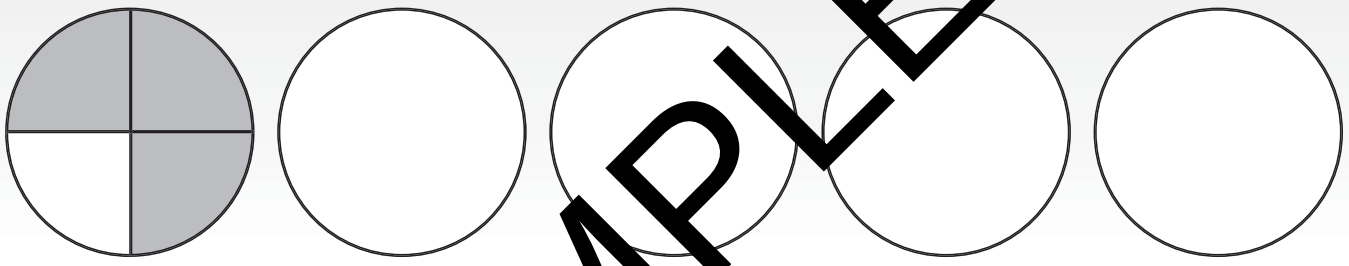


NAME: _____

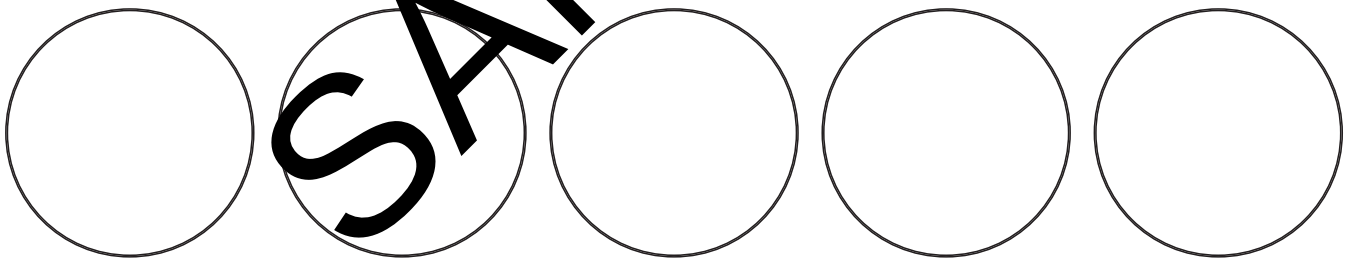
Task Sheet 3

3) **Amanda's cross country coach was so proud of the team for their hard work that he bought them all pizza. Each class ordered a different number of slices for each type of pizza.**

Create a circle graph to match the fraction for each pizza, then color each portion in. The first one has been done for you.



3/4 4/5 3/8 4/10 1/3



2/3 1/5 2/8 4/4 1/2

Reflection

Survey your classmates to find out what pizza they like best. Create a circle graph in a drawing program on the computer to display the information you collected. Compare your answers with another class.

NAME: _____

Task Sheet 7

7) Chung Lee's school has 200 students. A portion of these students sign up for different extracurricular activities.

- 36 sign up for Art Club
- 44 sign up for Science Club
- 23 sign up for Drama Club
- 28 sign up for Chess Club
- 52 sign up for Photography Club

a) What percentage of students signed up for Art Club?

i) 12 ii) 22 iii) 18

b) What percentage of students signed up for Science Club?

i) 22 ii) 45 iii) 61

c) What percentage of students signed up for Drama Club?

i) 12 ii) 25 iii) 28

d) What percentage of students signed up for Chess Club?

i) 8 ii) 14 iii) 22

e) What percentage of students signed up for Photography Club?

i) 23 ii) 26 iii) 29

f) How many students in total signed up for extracurricular activities?

i) 165 ii) 176 iii) 183

Explore With Technology

Visit http://nces.ed.gov/nceskids/createagraph and create two charts (bar, circle, or pictograph) to display the information above for number of students in a club and percentage of students in a club.