NCTM Process Standards Rubric

Data Analysis & Probability – Drill Sheets

Drills (columns): Warm-up 1, Timed Drill 1, Timed Drill 2, Warm-up 2, Timed Drill 3, Timed Drill 4, Warm-up 3, Timed Drill 5, Timed Drill 6, Warm-up 4, Timed Drill 7, Timed Drill 8, Warm-up 5, Timed Drill 9, Warm-up 6, Timed Drill 10, Timed Drill 11, 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.
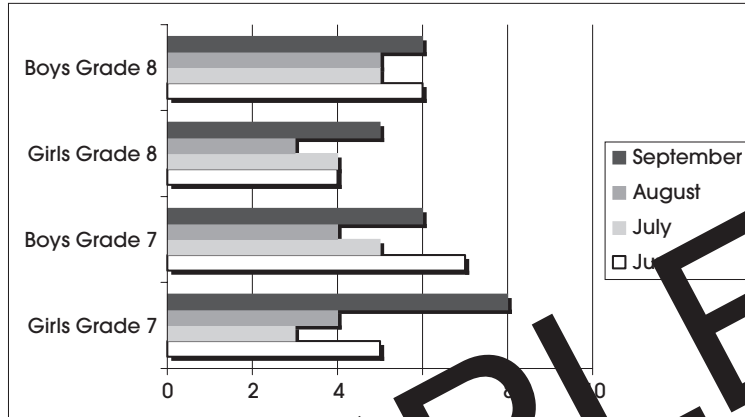
SAMPLE

8 Minutes

14a) **The following bar graph shows the number of students who have birthdays during summer months in grades 7 and 8.**

Birthdays in Class

Legend: ■ September ■ August □ July □ June

i) How many total 7th grade boys have a birthday in a summer month? _____

ii) How many total 7th grade girls have a birthday in a summer month? _____

iii) How many total 8th grade boys have a birthday in a summer month? _____

iv) How many total 8th grade girls have a birthday in a summer month? _____

v) Which two grades and genders have the same amount of students with birthdays in the summer months? _____

vi) What fraction of the summer month birthdays belong to 7th grade girls? _____

vii) What percent of the summer month birthdays belong to 8th grade girls? _____

viii) How many total boys birthdays are in the summer months? _____

ix) How many total girls birthdays are in the summer months? _____

x) In which month do an equal number of boys and girls in one grade share the same birthday? _____

xi) Which two months do the same amount of 8th grade girls have a birthday? _____

xii) What is the ratio of eighth grade girls' birthdays to seventh grade girls' birthdays? _____

xiii) What percent of total 7th grade girls' birthdays occur in June? _____

xiv) What percent of total 8th grade girls' birthdays occur in July? _____

xv) What is the ratio of 7th grade boys born in September to 8th grade boys born the same month? _____

xvi) What fraction of 8th grade boys have a birthday in June or July? _____

xvii) What is the ratio of 7th grade summer month birthdays to 8th grade summer month birthdays? _____

Review C

a) **The following column chart shows the number of boxes of each type of cookie sold for three different groups at the Wildlife Scout cookie sale.**

Wildlife Scout Cookie Sales

Legend:
- ■ Chocolate
- ■ Peanut Butter
- ■ Mint
- □ Coconut
- □ Caramel
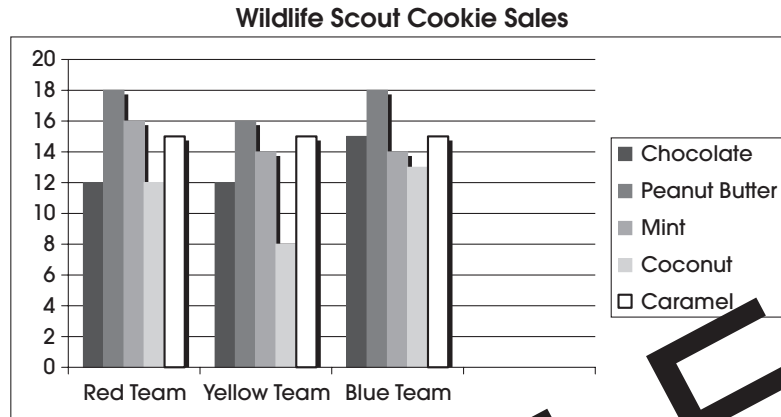
i) How many total cookie sales did the Red Team have? _____

ii) How many total cookie sales did the Yellow Team have? _____

iii) How many total cookie sales did the Blue Team have? _____

iv) Forty percent of the cookie sales for the Blue Team were for which two cookies? _____

v) Thirty four cookie sales for the Red Team were which two varieties? _____

vi) The Yellow Team had twice as many Peanut Butter cookie sales as sales of which cookie? _____

vii) The Yellow Team and Red Team both had 12 of which cookie sales? _____

viii) The three teams had equal sales for which type of cookie? _____

ix) The Red Team had an equal number of which cookies sold? _____

x) The Blue Team has a 1:1 ratio in which two cookie sales? _____

xi) What is the ratio in Mint Cookie sales between the Yellow Team and Blue Team? _____

xii) Twenty percent more of which cookies were sold by the Red Team than Caramel cookies? _____

xiii) Which team had the smallest number of sales for one type of cookie? _____

xiv) What is the ratio of Peanut Butter sales to Chocolate sales for the red team? _____

xv) There is one less total sales of which cookies than there were total sales of Caramel cookies for all three teams? _____

xvi) What is the average number of Chocolate cookie sales for all three teams? _____

Proportions and Fractions

The tally chart below shows how people responded to a question about ice cream flavors. Work with a partner or small group to answer the questions below.

Flavor	Student's responding
Vanilla	/////
Chocolate	///// /////
Butternut	///
Mint	///// /
Rocky road	//
Watermelon	///

a) What question might students have been asked in order to get the results shown on this chart?

_____

b) List the flavors in order from most votes to least votes.

_____   _____   _____   _____   _____

c) Identify how many students were asked to participate in this chart.

_____

d) Make three proportions for this chart (example, what is the ratio of students who chose chocolate to students who chose watermelon).

_____

_____

_____

e) Make three fractions based on this chart (example, what fraction of the total students selected rocky road).

_____

_____

_____

f) As a group, decide what type of graph best shows this data. Then, put this data into the graph.