

INTRODUCTION

Introduction

This course consists of eight two-hour lessons. Lessons are sequential and designed to be a glimpse into some of the fundamental principles of data analysis. It is not intended to be a comprehensive treatment, but rather an introduction.

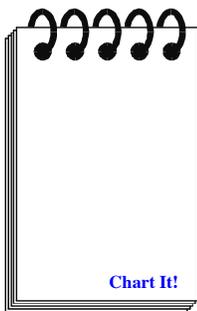
Many parents will be very nervous and unsure of themselves when beginning a mathematics course after many years out of school. Some will bring negative preconceptions about mathematics and be unsure of themselves as learners. For this reason, it is important to keep the sessions informal, fun, and non-threatening. Reviewing the agenda for the evening is comforting to adults.

There are several features to the course.

Investigations

Many sessions have investigations into the collecting, displaying and interpreting data. These activities will take a long time. The instructor should allow all the time that is necessary to understand the concepts demonstrated by the activity. This constructivist approach helps participants see ways that they can make the concepts come alive for their children.

Use of Recording Tools



We suggest that you set up an easel with chart paper to be used for the Chart It! It is used during each session to list terminology, summaries of activities, issues or questions that occur, as well as important concepts that the instructor wants to return to in a later class. Throughout the facilitator notes, the Chart It! icon (shown to the left) will be used to suggest charting an idea.

Use of Group Work

Working in groups is important to the atmosphere and the success of the investigations. To provide a comfortable environment for group work, choose a room that has adult-sized tables and chairs. During group work be sure to walk around and listen to the conversations in order to know what the participants are thinking.

Presentations

Providing opportunities for participants to present and talk about their ideas is essential. The facilitator notes have suggestions for group discussion and whole class presentations. These processes are time consuming, but well worth the time in exchange for the understanding that comes from such discussions.

Preparation

The instructor needs to have all the materials ready for each session. This requires checking in advance for the list of materials required. It is also convenient to have calculators available so that the participants can focus on the data concepts and not get bogged down by computations.

MATERIALS FOR INSTRUCTORS AND PARTICIPANTS

Materials needed by instructor (every session)

- Overhead projector, screen, blank write-on transparencies and pens
- Pencils and paper for participants
- Chart It!
- Set of manipulatives used in each of the sessions for the overhead projector
- Overhead calculator
- Easel
- Chart paper, plain and 1" grid and chart markers
- Transparent and masking tape
- Meter stick (two for Session 7)

Materials needed for participants

Session	1	2	3	4	5	6	7	8
Transparencies, blank and pens	•	•						
Colored dots, large	•				•		•	
Chart markers	•	•	•					
Transparent tape	•							
Index cards, 5 x 8	•							
Highlighters	•							
Chart paper, plain		•						•
Paper		•			•	•		
1" paper strips			•	•				
Calculators			•			•		
Compasses			•					
Glue			•					
Rulers			•				•	•
Colored pencils			•	•	•	•		•
Scissors			•					
Graph paper				•	•	•	•	•
3 x 3 Post-its®, two different colors				•				
Raisins, .5 oz boxes				•				
Napkins or paper towels				•				
Chart paper, 1" grid				•	•	•		
Black markers				•	•	•		
Unifix cubes					•			
Colored tiles						•		
2 x 2 squares (BLM 29)						•		
Tape measures							•	
Certificates of Completion (optional)								•

SESSION ONE DATA AROUND US

Outcomes

- To set a positive tone for the class by promoting conversation and establishing a welcoming atmosphere.
- To introduce participants to the topics for the class by soliciting information about them as individuals and as a group.
- To explore the meaning of "data" and "statistics" and how they are used in everyday life.
- To introduce participants to the NCTM Standards related to data analysis.
- To begin the process of developing a survey.

Overview

This first session is designed to set the tone for the course. Participants will be actively involved in activities that promote building of understanding of mathematical ideas in a non-threatening atmosphere. Participants will frequently be asked to share their ideas and results from small group activities with the whole group.

Time

- 30-40 minutes** In the first part of the session participants create graphs by posting information about themselves. They introduce themselves and then use the graphs to generate some statements about the class as a whole. This serves to help participants learn about each other while introducing some basic notions to be covered in the class.
- 15-20 minutes** In this activity, participants look at general statements that are in the newspaper based on data. They discuss what these statements mean and how data affects the decisions that they make in their lives.
- 20 minutes** Participants are introduced to collecting and displaying data by answering a question such as: What is your favorite food? The group decides on a way to gather the information, then groups of 4 choose a way to display data on a transparency. Finally groups present their representation.
- 30 minutes** In small groups, participants read the **NCTM Standards and Expectations** relative to data analysis. New ideas from the discussion are recorded on **Chart It!**.

Materials

Facilitator	Transparencies (English & Spanish)
<ul style="list-style-type: none">• Transparency of an article from a newspaper that has a general statement that would be of interest to the class.	<i>BLM 1: All About Us</i> <i>BLM 2: Examples of Statistics</i>

Materials

Participant	Handouts (English & Spanish)
<ul style="list-style-type: none"> • Transparencies, blank, enough for each group of 4 • Transparency pens, one set for each table • Colored dots, one package for class • Chart markers, one set for each table • Transparent tape, one roll for each table • 5 x 8 index cards, one for each participant's name tent • Highlighters, one per participant 	<p>One per participant for class <i>BLM 3.1-4: NCTM Standards and Expectations</i></p> <p>One per participant for home <i>BLM 4: Bringing Mathematics Home 1</i></p>

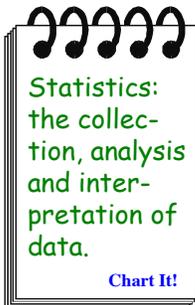
Activities

Preparation of Classroom	Notes																												
<p>1. Create charts for recording:</p> <ol style="list-style-type: none"> Number of Children Country of Birth Age Gender Color of Eyes Years in the United States <p>2. Place charts around the room. Place colored dots on tables. Display the transparency All About Us with directions for first activity.</p> <p>These charts will be used again in session 4.</p>	<p>Charts can be set up vertically or horizontally and can be organized differently. Instead of colored dots, participants could record with check marks. Example of charts:</p> <table border="1" style="margin-bottom: 10px;"> <tr> <td style="border-right: 1px solid black;">Number of Children</td> <td></td> </tr> <tr> <td style="border-right: 1px solid black;">1</td> <td>● ● ● ●</td> </tr> <tr> <td style="border-right: 1px solid black;">2</td> <td>● ●</td> </tr> <tr> <td style="border-right: 1px solid black;">3</td> <td>● ● ●</td> </tr> </table> <p>You can use the same type of chart for Gender and Color of Eyes:</p> <table border="1" style="margin-bottom: 10px;"> <tr> <td colspan="2" style="text-align: center;">Country of Birth</td> </tr> <tr> <td style="border-right: 1px solid black;">United States</td> <td>● ●</td> </tr> <tr> <td style="border-right: 1px solid black;">Mexico</td> <td>● ● ● ●</td> </tr> <tr> <td style="border-right: 1px solid black;">Canada</td> <td>●</td> </tr> </table> <p>For Age and Years in the U.S., use 5 or 10 year intervals:</p> <table border="1" style="margin-bottom: 10px;"> <tr> <td colspan="4" style="text-align: center;">Age</td> </tr> <tr> <td style="border-right: 1px solid black;">0-5</td> <td style="border-right: 1px solid black;">6-10</td> <td style="border-right: 1px solid black;">11-15</td> <td>etc.</td> </tr> <tr> <td style="border-right: 1px solid black;">● ●</td> <td style="border-right: 1px solid black;">● ● ● ●</td> <td style="border-right: 1px solid black;">●</td> <td></td> </tr> </table>	Number of Children		1	● ● ● ●	2	● ●	3	● ● ●	Country of Birth		United States	● ●	Mexico	● ● ● ●	Canada	●	Age				0-5	6-10	11-15	etc.	● ●	● ● ● ●	●	
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All About Us (30 - 40 minutes)																													
<p>1. As participants come in, display the transparency All About Us. Have participants put dots on the charts that have been posted around the room.</p>																													

Activities

All About Us (continued)	Notes
<p>2. Have each participant make a name card in large print on both sides. Save for use each week.</p> <p>3. Have participants introduce themselves and share one thing that they recorded on one of the charts.</p> <p>4. Have participants work in small groups. Refer to the charts and ask:</p> <ul style="list-style-type: none"> • <i>What kind of information can your group gather about our class from our charts?</i> • <i>See if you can come up with a few general statements.</i> <p>5. Have groups report their thoughts. Record general statements about the whole group on each chart.</p>	<div> </div> <p>The name cards should be collected at the end of each class and handed out at the beginning of each session.</p> <p>At the conclusion of class, roll up the charts and keep them to post around the room in session 4.</p>
What is Data (15 - 20 minutes)	
<p>1. Tell the participants that they have just completed a two-step process. First they gathered information, and then they made general statements about the class based on the information that was gathered. Many say that we are now living in the Age of Information. Information is found in the newspapers, magazines, Internet, and almost everywhere! Tell them that they are going to look at some examples from the newspaper.</p> <p>2. Display a transparency from a current newspaper. Ask participants what they have learned from reading the statement.</p> <p>3. Display the transparency Examples of Statistics.</p> <ul style="list-style-type: none"> • More than 50% of all marriages end in divorce. • Office vacancy rate climbs to 19%. • Asthma afflicts 12% in the United States. • The government spends about \$300 billion a year on defense. • The government spends about \$470 billion a year on education. <p>4. Tell participants that these are all general statements that have been made after some information was collected. The information that is collected to be analyzed is called data.</p> <p>5. Discuss the following questions:</p> <ul style="list-style-type: none"> • <i>What surprises you from this list of general statements?</i> 	<div> </div>

Activities

What is Data (continued)	Notes
<ul style="list-style-type: none"> • <i>Can you think of any general statements based on data that guide you in making decisions?</i> (If there is a 60% chance of rain today, I will bring my umbrella.) • <i>Why do we collect and analyze data?</i> <p>Record ideas that are shared on a transparency.</p>	
Our Favorite Food (20 minutes)	
<p>1. Tell participants that general statements often times come from surveys. In order to experience this, we are going to survey the class to find out what is the group's favorite food. Our task will be to create a survey to find out what is the group's favorite food; survey the class; and then decide how to organize the information so that it will be easily understood.</p> <p>2. As a whole group, pick about 6 foods to be included in the little survey. When thinking of things like desserts, it might be good to classify them: chocolate bars, ice cream, pies, etc.</p> <p>3. Once the foods are chosen, decide on how to collect the information. Possibilities include: naming one's choice out loud and keeping a count; having different parts of the room for each choice and having people gather there; secret ballot, etc.</p> <p>4. Collect the data and record it on a transparency in an unorganized, long list. Give each group of 4 a transparency so that they can decide how they want to display the information in an organized fashion. Have them write a general statement about the information on the bottom of the transparency. Have each group present their ideas.</p>	<p>The purpose of this activity is to have the group think about ways to collect, organize, and display data to answer a question. Formal display of information in graphs is discussed in later sessions. Save data for lesson 3.</p>
NCTM Standards (30 minutes)	
<p>1. Give each parent a copy of the NCTM Standards and Expectations relative to statistics. Tell participants that statistics is the collection, analysis and interpretation of data, like they have been doing with the class information.</p> <p>2. Form at least 4 groups, assigning each group responsibility for one grade span, PreK-2, 3-5, 6-8, 9-12.</p> <p>3. Have parents read the standards for their grade span and highlight all the concepts, topics, or key words that are not clear (about 15 minutes).</p>	<p>State standards could be used for this activity instead of the national standards. However, when preparing this section, remember that accommodating different languages is important.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <p style="color: green; margin: 0;">Statistics: the collec- tion, analysis and inter- pretation of data.</p> <p style="color: blue; font-size: small; margin: 0;">Chart It!</p> </div>

Activities

NCTM Standards (continued)	Notes
<p>4. Use Chart It! to record the different vocabulary that the class does not understand. Keep this for use each week and point out new concepts as they are developed throughout the class.</p>	
Take Home Activities (5 minutes)	
<ol style="list-style-type: none"> 1. Distribute Bringing Mathematics Home 1 for participants to take home. 2. Let participants know that they should be ready to share their experiences at the next session. 	
Preparation for the Next Session (5 minutes)	
<ol style="list-style-type: none"> 1. Collect name cards for use in the next sessions. 2. Fold or roll the All About Us charts and bring them to session 4. It is optional to bring the charts to session 2 and 3. 3. Save Chart It! and bring it to the next session. If desired, you may have the log typed and distributed to participants at the next session. 	

