*CHAPTER 4:*

# THE OPENING

The purpose of the opening activities is to provide real-life opportunities for children to use mathematical concepts which are introduced through other Mathematics Their Way activities — such as: time; counting by various groupings ("two's", "five's", "ten's" etc.); creating and searching for patterns; estimating and predicting answers; collecting and organizing data. The illustration of the activities in this section typifies what might happen early in the school year (October 27). All these activities probably would not be on display by October. This is a gradual process.

## WHEN YOU PLAN YOUR CLASS'S OPENING ACTIVITIES:

- Select only a few of the activities. Gradually incorporate additional activities as the year progresses.

- Choose only the activities that best meet the developmental and mathematical needs of your class. Some activities are more appropriate for second grade than kindergarten and vice versa. Remember, the opening illustration shows a collection of activities from a variety of classrooms and grade levels.

- Use the daily opening sessions to focus on concepts that are being explored during the class's math time.

- Keep the daily procedure simple and flexible. Questions posed by the teacher and/or children should flow naturally from the activity.

- Encourage children to take turns being the opening leader as soon as they understand the routine. The teacher then becomes both facilitator and participant. The teacher models procedures any time a new activity is introduced.

- Make sure all students have an opportunity to be the leader. Develop a system to determine whose turn it is each day to be the leader.

# HOW TO MAKE THE OPENING ACTIVITIES



The sizes of the opening components listed in the following directions are only suggestions. Adapt the directions to make the activities you choose fit your actual classroom restrictions (i.e., open classroom space with no walls or double sessions of kindergarten in the same classroom).

Choose a bulletin board or wall space in your room where the whole class can gather daily to discuss the opening activities. Some of the calendar items must be prepared every month. Others are prepared once and can be used year after year. It's also important to include the children in the planning and preparation.
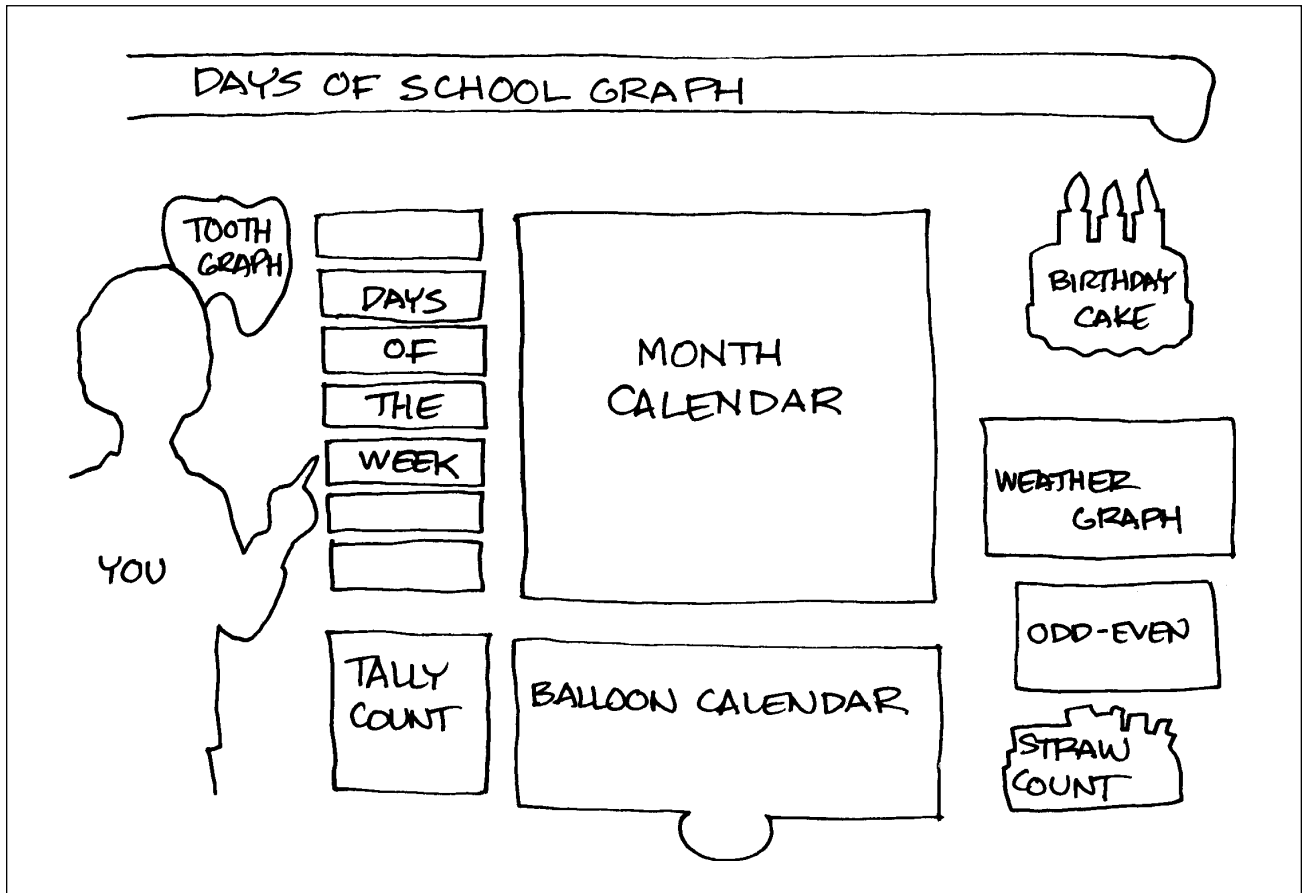
*Key to Opening Activities Board*

## 1.    DAYS IN SCHOOL ACTIVITIES
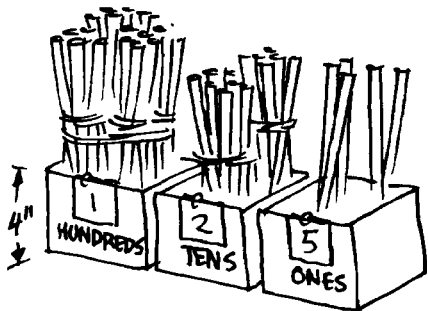


### (a) Straw Count

Use three half-gallon milk cartons (or three boxes similar in size). Cut the tops off the cartons. Make the carton bottoms approximately four inches high. Cover the outside of the cartons, each with a different color. Label the boxes "one's", "ten's", and "hundred's".

Optional:  Hang a place value number-flip outside each box to indicate the number of items in the boxes.
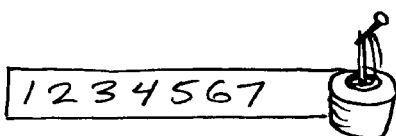
### (b) Number Line

Tie a string through a roll of adding machine tape. Secure the string to the wall. There should be enough room to roll out the paper during the school year.

# 2. DAYS OF THE WEEK ACTIVITIES

## (a) Day Sequence

Cut seven pieces of 2"x 8" tagboard. Punch a hole in the upper left and right edges of each card. Print one weekday name horizontally on each card. Hang the cards in a vertical line with straight pins.
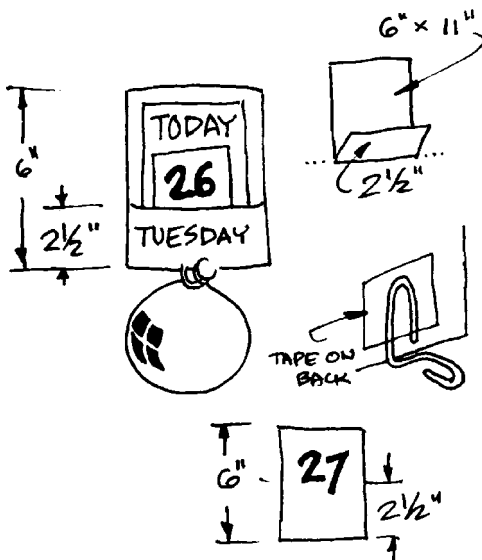
## (b) Balloon Calendar

**Pockets:** Cut seven pieces of 6"x 11" tag. Fold one 6" end to make a pocket (2-1/2" deep) to hold the date cards. Staple or tape the sides of the pocket. Print one day of the week on each 2-1/2" pocket face. Tape a separated paper clip to the back of each pocket, so that half of the clip extends perpendicularly from the bottom of the pocket.

**Date Cards:** Cut thirty-one pieces of 3-1/2"x 6" tagboard. Write the dates on the card approximately 2-1/2" above the bottom edge (one numeral per card).

**Yesterday, Today, Tomorrow Cards:** Cut three pieces of 5"x 8" tag, preferably a different color than the date cards. Write Yesterday, Today, Tomorrow on the top 1-1/2" of the cards (one word per card).

# 3. MONTHLY ACTIVITIES

## (a) Monthly Calendar

Make a calendar grid on a large piece of tagboard. Cut a slit at the top of each square. Insert a paper clip. Secure the paper clips on the backside of the calendar with tape.
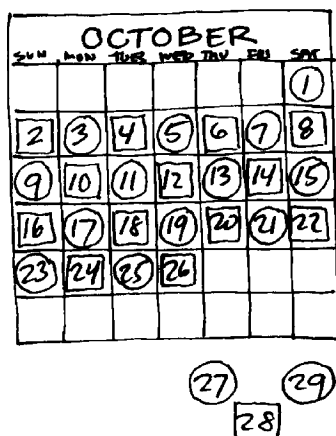
**Date Cards:** Choose a pattern for the monthly calendar each month. The pattern could be indicated by color, shape, position or simple pictures that seasonally represent the month — such as: pumpkins and ghosts for October. Begin with simple patterns (e.g., pumpkin, pumpkin, ghost). Cut out the patterns (one for each day of the month). Punch a hole at the top so the card slips onto the paper clip on the monthly grid. Arrange the cards in order of the pattern and write the month's dates on the front. Some teachers laminate the monthly patterns and use them year after year.

*Variation:* Some teachers like to keep a permanent record of each month's calendar pattern. They simply glue the patterns onto a large piece of tag or construction paper rather than hanging them onto the reusable monthly grid described above. The old patterns can be displayed on the wall or kept in a large scrapbook. The class then has an opportunity to compare the different monthly patterns.
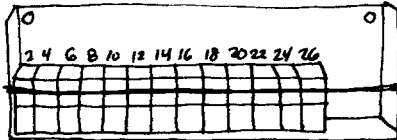
### (b) Odd & Even Chart
Cut a shoe box lid or a ditto master lid in half lengthwise. Staple a piece of paper for each month of the school year on the inside of the lid. Stretch a large rubber band (or sewing elastic) around the lid to hold the Unifix cubes in place.
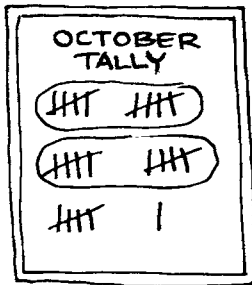
### (c) Tally Count
Use a 9"x 12" piece of paper or a small chalkboard.

### (d) Commercial Calendar
Display a commercial calendar in the opening area.

# 4. MONTHLY GRAPHS

### (a) Birthday Cake Graph
See MTW Blackline #25. Duplicate 12 cakes on colored tagboard (one for each month) and enough candles for one per child.
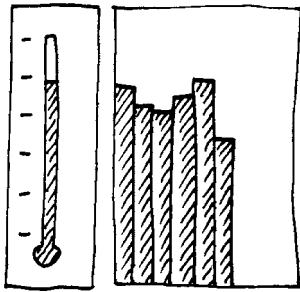
### (b) Tooth Graph
See MTW Blackline #26. Make one tooth for every month you are in school. Write the name of each month on each tooth.

## (c) Temperature Graph

Purchase a large outdoor thermometer. Cut strips of red construction paper (1/2" by 12"). Prepare a piece of tagboard to record the construction strips.



## (d) Weather Graph

See Newsletter Blackline #4. Duplicate one weather graph for every month you are in school. Write the name of one month on each weather graph.
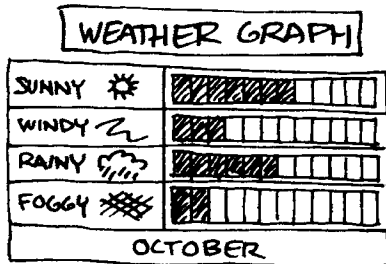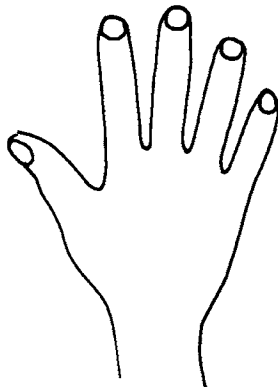
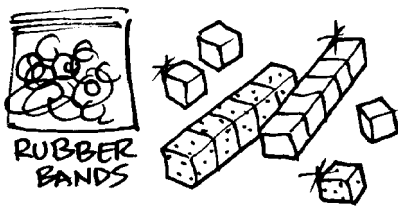# 5. MISCELLANEOUS ITEMS

## (a) Right Hand

Place an outline of a right hand on the classroom wall. When the children need to determine which hand is their right hand, they can match their right hand to the illustration.

## (b) Opening Supplies

Store the items used at the opening area in a large zippered plastic bag. Punch a hole in the side of the bag and hang the supplies on a straight pin near the opening activities.

|       | Extra date cards (store in small zippered bags) |
|-------|------------------------------------------------|
| 31    | Unifix cubes (two colors)                      |
| 180   | Extra balloons                                 |
| 40    | Red construction paper strips (height of the thermometer, 1/2" wide) |
| 1-2   | Glue sticks                                    |
| 180   | Straws                                         |
| 20    | Small rubber bands                             |
| 3     | Place value number flips (see MTW, p. 363)     |
| 1     | Small chalkboard (store near the opening supplies) |
| 1     | Chalk and eraser                               |
| 1     | Popping pin                                    |

BALLOONS

STRAWS

PAPER STRIPS

POPPING PIN

PLACE VALUE FLIPS

GLUE STICKS

RUBBER BANDS

UNIFIX CUBES (2) COLORS

DATECARDS

26

CHALKBOARD
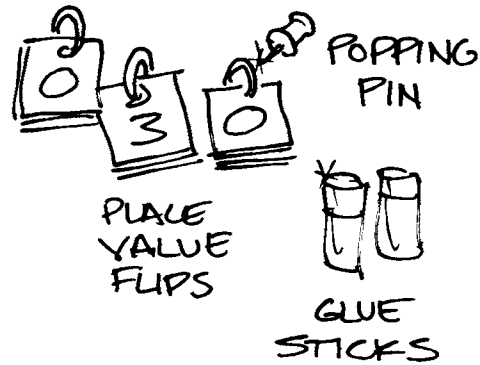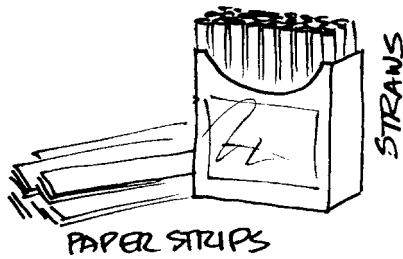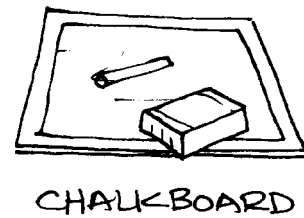
# OPENING PROCEDURES
## DAYS IN SCHOOL ACTIVITIES

*Concepts:* Counting by a variety of groupings (forward and backward); place value (a visual illustration of regrouping in base ten); problem-solving; time (school year)

The number line (activity 1b) is an abstract recording indicating the number of days the class has attended school. The straw count (activity 1a) corresponds with the total recorded on the number line.

## Straw Count

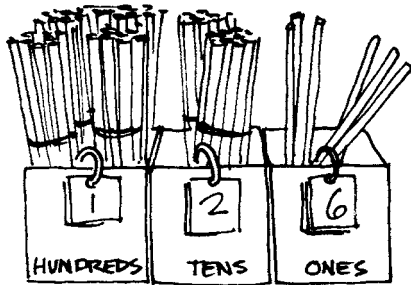A straw is added to the "one's" box each <u>school</u> day. The total number of straws should be the same as the numeral written on the number line that day. The class counts the straws. When there are ten straws in the "one's" box, the leader wraps them with a rubber band and moves them to the "ten's" box. When there are ten different groups of rubber banded straws in the "ten's" box, they are grouped together and moved to the "hundred's" box.

*Optional:* Attach place value number flips to the front of the straw boxes. Each day the leader turns the flips to indicate the number of days in school to match the number of straws in the boxes.

## Number Line Procedure
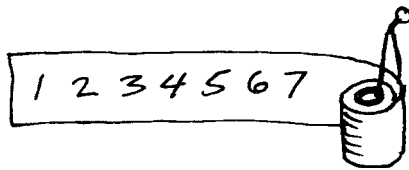
Each day the teacher records the number of days the class has attended school that year. The number line should be kept simple. Numerals that are multiples of ten are written in a different color. Later in the year, the teacher could also devise a way to indicate the multiples of two and five. One way is to underline the even numbers (multiples of two) and circle the multiples of five. Some teachers indicate a few special holidays on the number line. For example, a pumpkin or a ghost might be drawn next to the numeral when Halloween occurred. If you decide to do this, make sure you choose only the most significant events so as to not clutter the number line with too many extraneous symbols.

*Note:* The italic words enclosed in parentheses in the sample questions are meant to be examples. Be sure to use numbers that are appropriate for your children. Repeat the question several times with different numbers.

*Sample Leader Questions:*
- How many days have we been in school so far this year?
- How many straws are in the ("one's") box?
- How many straws do we have? Let's check by counting the bundles of straws in the ("ten's") box by ten's. Now let's count the one's box. (modeling counting-on, ("Ten, twenty, thirty, forty, …forty-one, forty-two, forty-three…")
- How do I write (forty-three)?
- How many groups of ten do we have? And how many one's?
- Let's count by (ten's/five's/two's).
- Is (forty-three) an odd or even number?

1 2 3 4 5 6 7 8 9 (10) 11 12 13 14 15 16 17 18 19 (20) 21 22 23 24 25 26 27
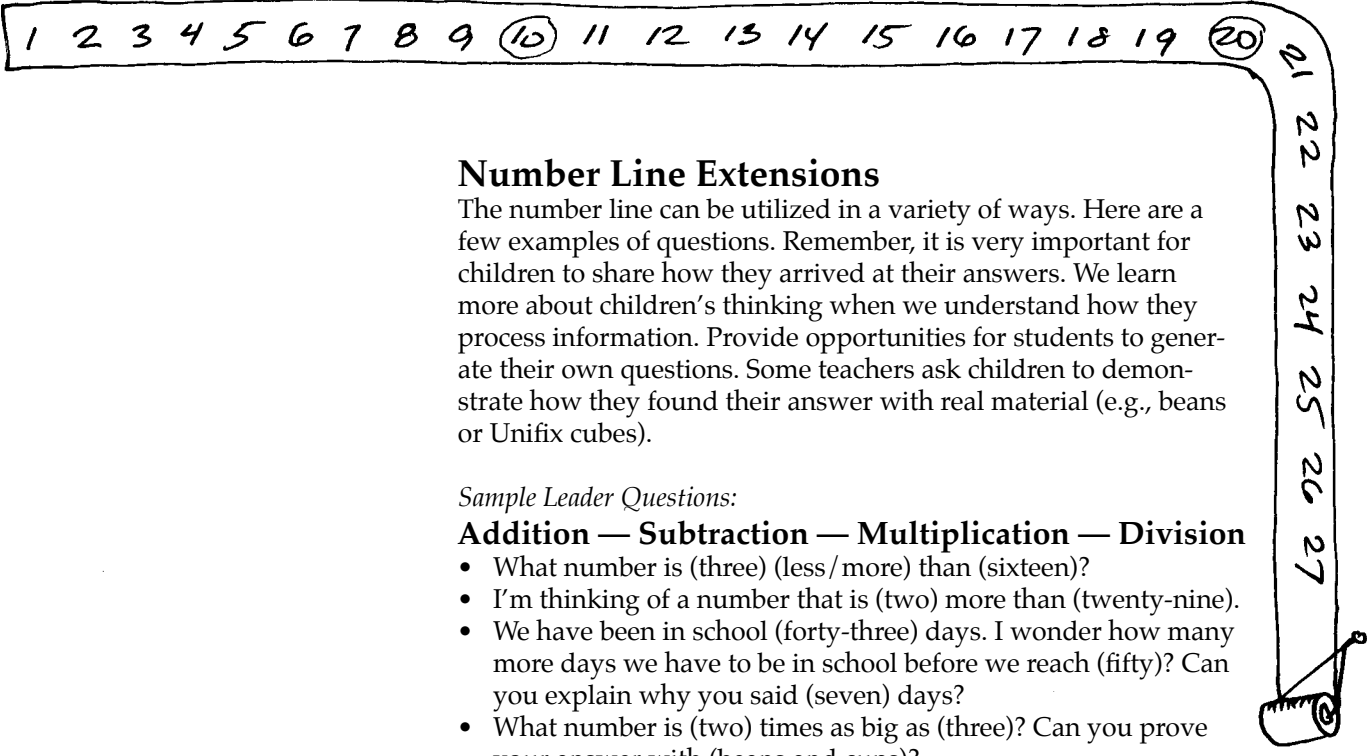
## Number Line Extensions

The number line can be utilized in a variety of ways. Here are a few examples of questions. Remember, it is very important for children to share how they arrived at their answers. We learn more about children's thinking when we understand how they process information. Provide opportunities for students to generate their own questions. Some teachers ask children to demonstrate how they found their answer with real material (e.g., beans or Unifix cubes).

*Sample Leader Questions:*

### Addition — Subtraction — Multiplication — Division

- What number is (three) (less/more) than (sixteen)?
- I'm thinking of a number that is (two) more than (twenty-nine).
- We have been in school (forty-three) days. I wonder how many more days we have to be in school before we reach (fifty)? Can you explain why you said (seven) days?
- What number is (two) times as big as (three)? Can you prove your answer with (beans and cups)?
- What number is (half) of (eight)? Prove your answer with (Unifix cubes).

### "I'm thinking of a number…"

- I'm thinking of a number between (ten and twenty). The number is larger than (twelve) and smaller than (sixteen). The number is (even). What is the number?
- I'm thinking of a number. It's an (odd) number. It's less than (twenty) and greater than (ten). It's a palindrome. What is the number?

### Before — After — Between

- What number is between (twenty-seven and twenty-nine)?
- What number is just before (nineteen)?
- What number is just after (thirty-nine)?

### Palindrome Numbers

- (Thirty-three) is a special kind of number. If I reverse the numerals in (thirty-three), the number still is (thirty-three). Numbers that can be reversed and still look the same are called palindromes.
- Can you see any other numbers on the number line that are palindromes?
- What do you think will be the next palindrome numeral?

# DAYS OF THE WEEK ACTIVITIES
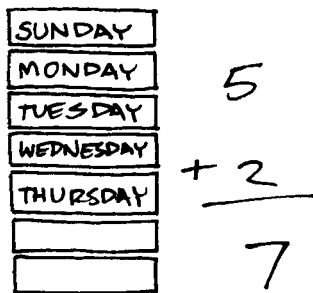
*Concepts:* Time (sequence of the days of the week, monthly dates, today / yesterday / tomorrow); making predictions; addition/subtraction

## Day Sequence

The leader points to the days of the week cards, as the class says the day names in order until they reach a card that is turned over. The class predicts the name of the day turned over (which should be the name of that day). The leader turns the card over to check the prediction.

*Sample Leader Questions:*

• Let's say the names of the days so far this week. …And today is _____.

• How many days have gone by so far this week? How many more days to go? How many days are there altogether in the week?

*Optional:* The teacher or leader may want to record the responses on a chalkboard in equation form (e.g., 5 + 2 = 7). If the children are comfortable recording numerals, they could record the equations on their individual chalkboards.

*Teacher may write 5 + 2 = 7*

## Balloon Calendar

The leader removes the "Today", "Tomorrow", and "Yesterday" cards from the pockets. He or she pops the balloon for that day and turns the date card over. Then he or she places the "Today" card behind that day's date, the "Yesterday" card behind the previous day's date and the "Tomorrow" card behind the next day's date.
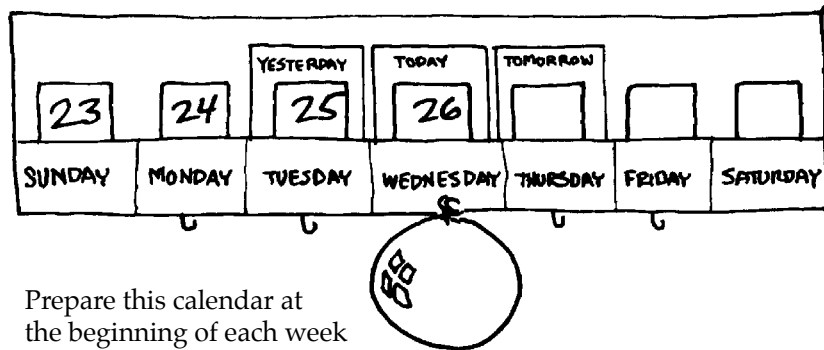
Prepare this calendar at the beginning of each week by:

• Hanging a balloon for each weekday. No balloons are used for Saturday and Sunday.

• Putting the new dates for that week in the pockets. Turn them over so they do not show. Keep Friday's date and balloon in place until the calendar has been shared on Monday. The new date can be placed underneath for convenience.

*Sample Leader Questions:*
- What is today's date?
  Class responds: "Today is (Thursday, October twenty-seventh).
- What was yesterday's date?
  Class responds: "Yesterday was (Wednesday, October twenty-sixth)
- What will tomorrow's date be?
  Class responds: "Tomorrow will be (Friday, October twenty-eighth)." The leader shows the class tomorrow's date to confirm their answers.

| Yesterday was | Wednesday | October | 26 |
|---|---|---|---|
| Today is | Thursday | October | 27 |
| Tomorrow will be | Friday | October | 28 |

| ↑ | ↑ | ↑ | ↑ |
|---|---|---|---|
| **These cards are permanent.** | **Make one set of cards.** | **Make 3 for every month.** | **Make 1 set of the numbers 1-31.** |

*Variation:* The illustration above shows how some teachers organize their calendar to model the concepts today, tomorrow, and yesterday.

# MONTHLY ACTIVITIES

*Concepts:* Time (days, weeks, months); searching for patterns; counting by different sequences, place value; odd and even



## Monthly Calendar

The date cards are arranged in a pattern. The pattern is indicated by an attribute (e.g., color, shape, or simple pictures that seasonally represent the month). The class predicts which attribute the date card for that day will have. To check the prediction, the class begins at the first day of the month and interprets the pattern until they reach the present date. The leader finds the card for that day and places it on the calendar.

If there's time, the children could interpret the pattern a different way. The patterns can be interpreted verbally (i.e., naming the color or shape of the card), and/or through movement. Students should be encouraged to recognize and describe vertical, horizontal and diagonal patterns that develop on the monthly calendar.

*Sample Leader Questions:*
- What (shape) will today's number be? Let's interpret the pattern to find out. ("Circle, square, circle, square…")

- If today's date is a (circle), then what do you think tomorrow's card will be?
- Interpret the pattern another way. What can we do when we see (a circle)? (A child responds, "clap") …And the (square)? (Another child responds, "stamp") If some children need help, encourage them to verbalize the action while they interpret the pattern (e.g. "Clap, stamp, clap, stamp…").
- Can anyone see another pattern on the monthly calendar? Look vertically, horizontally, and diagonally. Is there a (color / shape / position) pattern?
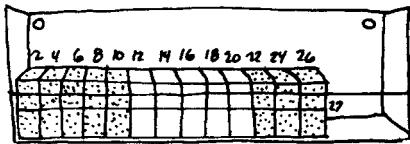
## Odd and Even Chart



Unifix cubes are stacked in groups of two. The chart corresponds to the number of days in the month (See Tally Count, Monthly Calendar). On Monday or after a holiday, the class determines how many Unifix cubes need to be added to make up for the days not in school. One color cube is used until there's a group of ten; then the cube color changes for the next group of ten. In that way the children can visually see the groups of ten.

Each day the leader adds a Unifix cube to the chart and writes the numeral. The class verbally counts the Unifix cubes by ten's, and two's to find the total. The total should correspond with the date.

*Sample Leader Questions:*
- How many cubes do I have to add today?
- The last number we wrote was (twenty-six).
- And one more makes (twenty-seven)?
- How do I write (twenty-seven)?
- Is (twenty-seven) an odd or even number?
- Let's count together.
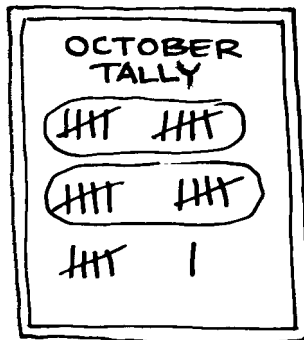
## Tally Count



The tally count corresponds with the monthly calendar. Tally marks are added on Monday for the weekend days. Tallies for holidays are added when school resumes.

The leader adds a tally mark each day, and slashes over four marks on day five. If there are two groups of five, the leader makes a circle around the two groups. Then the class counts the tally marks together, beginning with the circled groups of ten.

*Sample Leader Questions:*
- Let's check to see what the tally count was yesterday...and one more tally mark for today will make (class responds).
- How many groups of ten do we have so far this month?
- How many groups of five?
- How many more days before we make another slash to indicate a group of five?
- How many more days before we can make another circle of ten tallies?

SEPT.

OCT.

NOV.
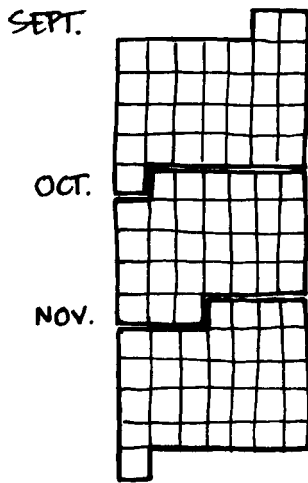
## Commercial Calendar

It's helpful to display a commercial calendar so children make the connection to calendars in the real world. References and comparisons to the commercial version can be made throughout the month (e.g., moon cycles, holidays indicated on the calendar…).

*Extension:* Children are often puzzled when they change the monthly calendar. They want to begin every month on Sunday. Here is an activity that might help them understand how the first day of the month is determined. At the end of the month, cut around the calendar's outline. Make sure you cut away all the blank boxes. Place that month's calendar so it fits with the previous month like a puzzle.

If you don't want to cut up the commercial calendar, then make a monthly grid and duplicate 12 copies. Write the month's dates in the appropriate boxes. At the end of the month, cut away the unused boxes and piece the month together with the previous month.

# OPENING GRAPHS

*Concepts:* Time (change of seasons); gathering, organizing, and interpreting data; making comparisons and predictions (daily, monthly, and seasonally) from the data.

*Sample Leader Questions:*
- Tell me about the graph.
- Do you see any patterns?
- Are any of the months the same?

<u>Note:</u> Save the monthly graphs. The children can compare the data gathered for each month. They will begin to draw conclusions and make predictions from the accumulated data. Some teachers make books out of the old monthly graphs. Others like to display the old graphs on the wall.

## Birthday Cake Graph

At the beginning of the school year, each child writes his or her birth date on a candle. (The teacher can prewrite the birth dates for young children). Twelve birthday cakes (one for each month) are displayed. The students place their candle on the appropriate cake. Then the class compares the results of the birthday graph. After the initial discussion, the cakes can be displayed in the room for the rest of the school year. Some teachers move the current month's cake to the calendar area. The birthday graph is referred to in a variety of ways during the school year.

*Sample Leader Questions:*
- Are there any cakes that do not have candles?
- Are there any cakes with the same number of candles?
- Which cake has the most candles?
- What else can you tell me about this cake graph? …etc.
- We had (three) birthdays last month in our class. This month there are (two) less birthdays. How many birthdays are there this month?
- Today is (October 27th). (Jose's) birthday is on (Halloween, October 31st). How many more days before (Jose's) birthday?

## Tooth Graph

When a child loses a tooth, he or she places a photocopied picture of himself or herself on the paper tooth for that month. It's fun to refer to the graph as the year progresses and compare how many teeth were lost each month. Is there a pattern developing?

Sample Leader Questions:
- Have there been any months when (no) children lost a tooth? (…three students)?
- Are there any teeth with the same number of pictures?
- Which tooth has the (most/least) pictures?
- What else can you tell me about this tooth graph? …etc.
- In (January) (five) teeth were lost. In (September) (three) less teeth were lost. How many teeth were lost in (September)?

Extension:  At the end of the year, make a concrete bar graph showing the monthly total of teeth lost. Make a small label for each month in school. Count the number of teeth lost each month. Make a Unifix stick for each month by stacking one Unifix cube for each tooth lost. Place the stacks next to the month's name. Compare the Unifix stacks.
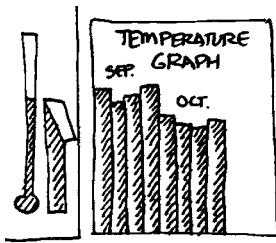
## Temperature Graph

This graph is especially fun in climates where the temperature varies. Take the outside temperature once a week (on the same day each week). Leave the thermometer outside during a recess break. At the end of recess, take a red paper strip, measure the temperature level indicated on the thermometer with the strip, then fold it down to mark the level and tear off the excess. (Don't be concerned with the degrees.) Glue the strip onto the temperature graph.

Sample Leader Questions:
- Which (month/season) has been the (coldest/warmest) so far this year?
- Do you think next (month/week) will be colder or warmer than this (month/week)?
- Are there any months where the temperatures were approximately the same?
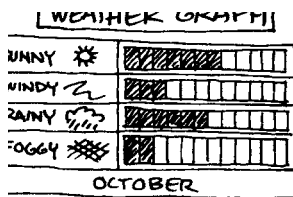
## Weather Graph

The class determines the weather for the day. The leader fills in the appropriate boxes on the weather chart with a crayon. Some days may be more than one type of weather (e.g., sunny and windy). Make sure the chart reflects the weather most common to your region.

Sample Leader Questions:
- Which type of weather have we had the (most/least)?
- Has the weather pattern been the same as last month's?

# MISCELLANEOUS
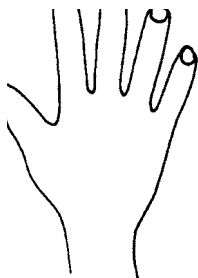
## Right Hand

Concept:  Directionality (right and left)

The hand is displayed in a spot where the students can see it anywhere in the classroom. When the children need to know whether something is on the right or left, they can orient themselves by matching their right hand with the illustration (e.g., when they pledge allegiance to the flag or when they play a game like Simon Says — "Simon says, stand on your right foot").