

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers from 1 to 5

Session: **Counting from 1 to 5**

Learning Objectives

- Determining the number of objects in a set, from 1 to 3, and recognizing the corresponding numerals.
- Determining the number of objects in a set, from 4 to 5, and recognizing the corresponding numerals.

Overview

We're having a very busy day! During five phases of the day - morning, noon, afternoon, evening, and night - we learn about the numbers 1 to 5.

Teaching Strategies

Prior to the session

- Have students take turns counting orally from 1 to 5.
- Have students count up to 5 objects in a set, and then rearrange the objects and have them repeat the count.

At the end of the session

- Have students draw or show the correct number of objects for any of the numbers from 1 to 5.
- Have students choose the numeral that represents the count of a given set of objects.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers from 1 to 5

Session: **Creating Sets of 1 to 5**

Learning Objectives

- Creating sets containing 1 to 3 objects.
- Creating sets containing 4 to 5 objects.

Overview

We're in a cold and frosty place! We count warm sweaters and hats, pick up some ice-blocks to fix an igloo, and help our friend catch some fish.

Teaching Strategies

Prior to the session

- Have students match sets of objects to the numerals that show how many objects are in each set.
- Have students read and match numerals to the count of sets of objects.

At the end of the session

- Give students more than 5 objects, and ask them to create sets that have fewer than 5 objects.
- Practice reading and writing the numerals from 1 to 5.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers from 1 to 5

Session: **Creating Representations of the Numbers from 1 to 5**

Learning Objectives

- Creating and recognizing representations of the numbers from 1 to 5.

Overview

We're fixing broken toys in the toy factory. We use chips and a 5-frame to show the number of toys.

Teaching Strategies

Prior to the session

- Have students represent the number of objects in a set with the corresponding numeral.
- Create black-line masters for a 5-frame or a 10-frame, and have students use chips in any arrangement to show the numerals from 1 to 5.
- Have students place a set of chips in various positions within a 5-frame or a 10-frame, and then repeat the count.

At the end of the session

- Have students use chips or counters to represent the number of objects within a set.
- Have students write the corresponding numeral that matches the number of chips or counters in a 5-frame or a 10-frame.
- Count the number of different objects in set and use chips or counters to make a picture graph that represents the set.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers from 1 to 10

Session: **Counting from 5 to 10**

Learning Objectives

- Determining the number of objects in a set, from 6 to 8, and recognizing the corresponding numerals.
- Determining the number of objects in a set, from 9 to 10, and recognizing the corresponding numerals.

Overview

We're building a house. We count the number of construction workers, and the number of different items they need to complete the job.

Teaching Strategies

Prior to the session

- Have students take turns counting orally from 5 to 10.
- Have students count up to ten objects in a set, and then rearrange the objects and have them repeat the count.

At the end of the session

- Have students use counters or chips to show the number of objects in a given set.
- Have students choose the numeral that represents the number of objects in a given set.
- Practice reading and writing the numerals from 5 to 10.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers from 1 to 10

Session: **Creating Sets of 5 to 10**

Learning Objectives

- Creating sets containing 5 to 10 objects.

Overview

We're hard at work on a farm, and we're getting hungry! We count the number of ingredients we need to make soup.

Teaching Strategies

Prior to the session

- Have students match sets of objects to the numerals that show how many objects are in each set.
- Have students read and match numerals to the count of sets of objects.

At the end of the session

- Give students more than ten objects and ask them to create sets that have ten or fewer than ten objects.
- Practice reading and writing the numerals from 5 to 10.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers from 1 to 10

Session: **Creating Representations of the Numbers from 5 to 10**

Learning Objectives

- Creating and recognizing representations of the numbers from 5 to 10.

Overview

It's time for some chickens to return to their coop. We show the number of chickens in the coop using a ten-frame and chips.

Teaching Strategies

Prior to the session

- Have students represent the number of objects in a set with the corresponding numeral.
- Create black-line masters for a 10-frame, and have students use chips in any arrangement to represent the numerals from 5 to 10.
- Have student place a set of chips in various positions within a 10-frame and repeat the count for each arrangement.

At the end of the session

- Have students place chips or counters in a 10-frame to represent a number and/or the number of objects within a set.
- Have students write the numeral that matches the number of chips or counters in a 10-frame.
- Given a set of chips or counters in a 10-frame, have students make up a story about what these chips represent.
- Have students identify the count, and draw or show how many objects are in a set, given a number of chips or counters placed in any order in a 10-frame.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers from 1 to 10

Session: **One More Than**

Learning Objectives

- Naming the numbers that are one more than 1, 2, 3, 4, and 5.
- Naming the numbers that are one more than 6, 7, 8, 9, and 10.

Overview

A juggler is entertaining the crowd at a carnival. We use chips and 5-frames to show the number of objects the juggler can juggle and balance.

Teaching Strategies

Prior to the session

- Have students repeat orally the counting sequence from 1 to 10.
- Starting in a corner cell in a 10-frame, have students insert chips or counters to represent the numbers, in order, from 1 to 10.

At the end of the session

- Draw a "one more than machine" on the chalkboard and ask students what number will come out of the machine when you insert a number from 1 to 9.
- Give students copies of black-line masters having sets of five 10-frames, and have students use counters to demonstrate and discuss what is meant by "one more than" a given number.
- Use arrow diagrams and number strips to show one more than each number from 1 to 9.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers from 1 to 10

Session: **One Fewer Than and Zero**

Learning Objectives

- Naming the numbers that are one fewer than 5, 4, 3, 2, and 1.
- Using "0" to represent the number of objects in an empty set.
- Naming the numbers that are one fewer than 10, 9, 8, 7, and 6.

Overview

We're at an afternoon concert in the park. The musicians are leaving the stage one by one. We use chips and 5-frames to show the number of musicians that are left.

Keywords

Zero

Teaching Strategies

Prior to the session

- Have students practice counting backwards from 5 to 0, and from 10 to 0.
- Give students copies of black-line masters having at least five 10-frames and then, starting at a corner cell, have students use counters to display the numbers from 5 to 1; repeat for the numbers from 10 to 5.
- Ask students how they could represent a collection that had nothing in it, e.g. an empty jar of candy.

At the end of the session

- Draw a "one fewer than machine" on the chalkboard and ask students what number will come out of the machine when you insert a number from 1 to 5 and/or from 5 to 10.
- Give students black-line masters having multiple 10-frames and have them use counters to demonstrate and discuss what is meant by "one fewer than" a given number.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers to 100

Session: **Counting from 10 to 20**

Learning Objectives

- Recognizing the numerals and word names for the numbers from 11 to 15.
- Using 10-frames to count and create sets of objects from 11 to 15.
- Recognizing the numerals and word names for the numbers from 16 to 20.
- Using 10-frames to count and create sets of objects from 16 to 20.

Overview

A diver is underwater, looking for pearls. We use 10-frames to count the pearls, and we learn the word names for the numbers.

Teaching Strategies

Prior to the session

- Have students count orally to 20 to determine how many know the correct sequence and word names of the numbers.
- Have each student use pairs of 10-frames to represent numbers up to 20 as combinations of ten and ones.

At the end of the session

- Have students match combinations of ten and ones to the corresponding word name and numeral of two-digit numbers within 20.
- Call out the numbers between 10 and 20 and have students show a corresponding representation of the number and its numeral.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers to 100

Session: **Counting from 20 to 50**

Learning Objectives

- Recognizing the numerals and word names for the numbers from 20 to 30.
- Counting and creating sets of objects from 20 to 30.
- Recognizing the numerals and word names for the numbers from 30 to 50.
- Counting and creating sets of objects from 30 to 50.

Overview

We're at the airport, counting suitcases on a conveyor belt.
We use blocks to count the number of passengers on a plane
and the number of suitcases that have fallen out.

Teaching Strategies

Prior to the session

- Have students count by ones orally to 50 to determine how many know the correct sequence and word names of the numbers.
- Distribute black-line masters of a blank 10 x 5 array and have students fill in the array with as many consecutive numbers as they can, starting at 1 and ending at 50.

At the end of the session

- Display a large 10 x 5 number chart and randomly point to various numbers and ask students to give their word names.
- State the word names of random numbers up to 50 and have students write the standard form of each number.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers to 100

Session: **Counting from 50 to 100**

Learning Objectives

- Recognizing the numerals and word names for the numbers from 50 to 100.
- Using a hundreds chart to show the numbers from 50 to 100.

Overview

A bank teller is using a coin machine to count pennies. We recognize the word names for the numbers of pennies, and we complete a number chart.

Teaching Strategies

Prior to the session

- Display a large 10 x 5 number chart and have students discuss the pattern of naming and writing numbers within each decade.

At the end of the session

- Randomly point to any number in a large hundreds chart and ask students to give its word name.
- State the word names of two-digit numbers within 100, and have students write the standard form of each number, and draw a picture, or use on-line and/or off-line manipulatives to represent it.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers to 100

Session: **Skip-Counting by Tens and Fives**

Learning Objectives

- Skip-Counting by tens and fives from 0 to 100.

Overview

We are loading pineapples into crates and then filling bottles with pineapple juice. We use blocks to count the pineapples by tens and the bottles of pineapple juice by fives.

Teaching Strategies

Prior to the session

- Have students use a hundreds chart to circle and name the decade numbers from 10 to 100.
- Have students count and record the number of objects in a given set, and then regroup the objects by fives and then tens.

At the end of the session

- Have students count by tens orally to 100, and by fives to 50.
- Have students write and name the multiples of 10 up to 100, and arrange them in ascending order.
- Have students complete or extend number patterns that involve multiples of 5 up to 50, and multiples of 10 up to 100.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Numbers to 100

Session: Skip-Counting by Twos

Learning Objectives

- Skip-counting by twos from 2 to 30.
- Recognizing the even numbers up to 30.
- Skip-counting by twos from 1 to 29.
- Recognizing the odd numbers less than 30.

Overview

It's a busy day at the laundromat. We use blocks to count an even number of laundry bags and an odd number of socks.

Keywords

Odd number

Even number

Teaching Strategies

Prior to the session

- Have students circle every other number on a hundreds chart starting with 2, and discuss the patterns they see.
- Have students circle every other number on a hundreds chart starting with 1, and discuss the patterns they see.

At the end of the session

- Randomly point to any 10 x 10 number on a large hundreds chart, and ask students to tell if it's even or odd, and explain why.
- Have students complete or extend number patterns that involve the even and odd numbers within 30.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Comparing and Ordering

Session: **More Than, Less Than, or The Same**

Learning Objectives

- Using one-to-one correspondence to compare equal and unequal sets.

Overview

It's a rainy day at the wildlife park. We match objects to animals and choose the correct number of objects to keep the animals dry.

Keywords

More

Fewer

As many

Teaching Strategies

Prior to the session

- Give students two equal-sized groups of like and/or unlike objects, and have them put them into a one-to-one correspondence.
- Have students display the correct number of counters or on-line manipulatives to represent the number of objects in a given set.

At the end of the session

- Give students two unequal sets and using the concept of one-to-one correspondence, have students explain why one set has more than or less than the other.
- Show students a set of objects, and have them draw or show a set that has more than or less than that number of objects.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Number Sense

Unit: Comparing and Ordering

Session: Comparing Numbers within 100

Learning Objectives

- Determining the inequality relationships between numbers from 1 to 10.
- Using symbols to express the inequality relationships between numbers from 0 through 10.
- Determining the inequality relationships between numbers from 10 to 100.
- Using symbols to express the inequality relationships between numbers from 10 through 100.

Overview

It's fun and games at the fair! Two contestants try the ring toss, a strength test and a throwing competition. We discover what signs we can use to compare numbers.

Keywords

Equals (=)

Greater than (>)

Less than (<)

Teaching Strategies

Prior to the session

- Have students examine the numbers in a hundreds chart and identify which of two numbers is greater than or less than the other.
- Have students describe the pattern of numbers in a hundreds chart as they move from left to right and from top to bottom.

At the end of the session

- Have pairs of students draw cards from a numbered deck and compare them using the words "more than", "less than", or "the same".
- Have students call out pairs of unequal numbers within 100, and have them use words and symbols to represent the inequalities.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Addition and Subtraction

Unit: Addition

Session: **Combining and Joining within 10**

Learning Objectives

- Building number sentences to represent and solve combining and joining problems.

Overview

We're visiting a reptile farm. We add numbers of turtles and alligators in a pool. We then show the sum of frogs and ducks in a pond.

Keywords

Add

Sum

Plus (+)

Equals (=)

Counting on

Teaching Strategies

Prior to the session

- Have students discuss the meaning of the words "combine", "more", and "join".
- Have students discuss what happens when two sets of countable objects (chips, blocks, coins) are combined into one set.

At the end of the session

- Have students use counting-on strategies to find the sum of two numbers, starting with both the greater number and the lesser number.
- Have students solve combining and joining problems and write the corresponding number sentences.
- Give students various number sentences and ask them to construct a problem that each might represent.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Addition and Subtraction

Unit: Addition

Session: Comparing within 10

Learning Objectives

- Building and completing number sentences when the second addend is unknown.
- Building and completing number sentences when the first addend is unknown.

Overview

We're getting ready for a birthday party. We add chairs for our guests, candles to a cake, and fish to a fish bowl.

Keywords

Less than (<)

Sum

Add

Fewer

More

Teaching Strategies

Prior to the session

- Remind students that two sets are equal if they have the same number of objects.
- Ask students to give examples of unequal sets and how they might make two unequal sets equal.

At the end of the session

- Have students draw arrow diagrams to model adding a number to a given number and finding the sum.
- Have students use letters (variables) to represent and find the missing addends in addition sentences, e.g. $3 + n = 7$ and $x + 2 = 6$.
- Discuss the difference in meaning between addition sentences of the form $x + 3 = 7$ and $3 + x = 7$, and have students provide examples of problems in which each might arise.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Addition and Subtraction

Unit: Addition

Session: Sums within 20, with 10 as One Addend

Learning Objectives

- Estimating solutions to addition story problems.
- Building and completing number sentences with 10 as an addend.

Overview

We're working on an archeological dig. We add dinosaur teeth to the ten we've already found, and add plates to a stegosaurus. We then find out how many tools were in a truck before we added ten more.

Keywords

Greater than (>)

Less than (<)

Counting on

Teaching Strategies

Prior to the session

- Show students collections of objects and ask them to decide by inspection if there are more or less than ten objects in the set.
- Review the word names and symbols of numbers between 10 and 20.

At the end of the session

- Have students draw arrow diagrams to model adding a number to 10 or adding 10 to a number and then finding the sum.
- Have students use letters (variables) to represent and find the missing addends in addition sentences, e.g. $10 + n = 17$ and $x + 10 = 12$.
- Discuss the difference in meaning between addition sentences of the form $x + 10 = 17$ and $10 + x = 17$, and have students provide examples of problems in which each might arise.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Addition and Subtraction

Unit: Addition

Session: Sums within 20

Learning Objectives

- Estimating to predict a sum.
- Determining the sum of two numbers up to 20.
- Recognizing and expressing the sum of two one-digit numbers as the sum of 10 and another number.

Overview

At a recycling center, we add the number of cans and bottles to be recycled. We estimate the sum, and then express the sum as ten plus another number.

Keywords

Sum

Greater than (>)

Less than (<)

Counting on

Teaching Strategies

Prior to the session

- Have students separate sets of up to twenty objects into one set of ten and another set of ones.
- Review the addition facts for each number between 10 and 20, where 10 is either the first or second addend, e.g., $10 + 3 = 13$ and $3 + 10 = 13$.

At the end of the session

- Have students draw arrow diagrams to model adding two numbers less than 20 and then finding their sum.
- Have students rewrite the sum of two numbers less than 20 as the sum of 10 and another number.
- Given a number between 10 and 20, have students write as many addition sentences for that number as they can.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Addition and Subtraction

Unit: Subtraction

Session: Differences within 10

Learning Objectives

- Counting backwards to find the difference between two numbers.
- Recognizing and completing number sentences involving differences within 10.
- Using subtraction to solve comparison problems within 10.

Overview

We're at the bowling alley. We subtract bowling balls from a rack. We then compare numbers of pins to find out how many pins a bowler has knocked down.

Keywords

Minus (-)

Subtract

Difference

Take away

Teaching Strategies

Prior to the session

- Have students discuss the meaning of the words "take away", "less", and "compare".
- Use arrow diagrams to discuss what happens as students count backwards from a number.

At the end of the session

- Have students use counting-backwards strategies to find the difference between two numbers, and represent this using subtraction sentences.
- Have students read and write an addition sentence for a corresponding subtraction sentence, e.g. $8 - 3 = 5$ and $5 + 3 = 8$.
- Give students various number sentences and ask them to construct take-away and comparison problems that each might represent.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Addition and Subtraction

Unit: Subtraction

Session: Differences within 20

Learning Objectives

- Building and completing number sentences involving differences within 20.
- Recognizing and solving comparison problems involving differences within 20.

Overview

We're looking at colorful butterflies at a butterfly farm. We compare the numbers of red and blue butterflies to find out how many more red butterflies there are.

Keywords

More

Take away

Teaching Strategies

Prior to the session

- Review the subtraction facts for numbers within 10.
- Review the concept of one-to-one correspondence to compare two sets and discuss how the two sets can be made equal.

At the end of the session

- Represent the number of objects in two unequal sets and use one-to-one correspondence and subtraction to find the difference between them.
- Have students read and write an addition sentence for a corresponding subtraction sentence, e.g. $12 - 7 = 5$ and $5 + 7 = 12$.
- Give students various number sentences and ask them to construct take-away and comparison problems that each might represent.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Geometry and Measurement

Unit: Measurement

Session: Length

Learning Objectives

- Arranging objects in order by height and by length.
- Using non-standard units to measure and compare lengths.
- Using inches and centimeters to measure and compare length.

Overview

We're at a sports tournament. We compare the lengths of straws to decide which team goes first. We use footprints to measure each long-jump, and we use rulers to measure the distances of two golf balls from the hole.

Keywords

Inch

Centimeter

Ruler

Teaching Strategies

Prior to the session

- Have students use string to compare their heights in a non-quantitative way.
- Have students give examples of what kinds of things are "long", "tall", or "short" and how they can tell.

At the end of the session

- Have students measure the length and width of the classroom by stepping it out and then have them compare the class results.
- Use inch and centimeter rulers to measure and compare the lengths and heights of various objects and people in the classroom.
- Ask students to list other units used to measure length and give specific examples of each.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Geometry and Measurement

Unit: Measurement

Session: Weight

Learning Objectives

- Using non-standard units to compare weights.
- Arranging objects in order, by weight.

Overview

We're in the post office, weighing packages. We use blocks and scales to weigh and sort the packages.

Keywords

Balance

Heavier

Lighter

Teaching Strategies

Prior to the session

- Have students give examples of what kinds of things are heavy and how they can tell.
- Demonstrate a pan balance and how it is used.

At the end of the session

- Have students bring various (small) objects into class and use a pan balance to see which is the heaviest and which is the lightest.
- Build a simple spring balance using a strong piece of elastic attached to a board, and use it to compare the weights of various common objects.
- Ask students to list other units used to measure weight and give examples of when each is used.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Geometry and Measurement

Unit: Measurement

Session: **Clock and Calendar Time**

Learning Objectives

- Recognizing and using ordinal numbers.
- Investigating the days of the week.
- Using analog and digital clocks to tell time to the nearest hour and half-hour.

Overview

Some astronauts are planning a mission to the Moon. We mark each day of the mission on a calendar. Then we fix the space shuttle's clock and learn how to tell time.

Keywords

Calendar

Yesterday

Today

Tomorrow

Minute

Hour

Minute hand

Hour hand

Teaching Strategies

Prior to the session

- Recite the Mother Goose poem "Monday's Child" and ask students about their own birthdays.
- Talk about the day and the night and how we can tell which is which.

At the end of the session

- Give students the names of the days of the week and have them put them in order starting with any day.
- Line up twenty students and call out a number from 1 to 20. Have a student name the corresponding ordinal number and move into that position in the line.
- Have students create a clock using paper plates and manipulable hands and then manipulate the hands to show various times on the hour and half-hour.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Geometry and Measurement

Unit: Measurement

Session: Money

Learning Objectives

- Identifying pennies, nickels, dimes and quarters and their values.
- Determining the amount of money represented by a set of pennies, nickels, dimes and quarters.
- Determining the number and types of coins needed to represent a given amount of money.

Overview

In a shop, we identify different types of coins and sort them according to their value. Then we use combinations of coins to help customers buy items in the shop.

Keywords

Penny

Nickel

Dime

Quarter

Teaching Strategies

Prior to the session

- Have students talk about their understanding of money and how it is used.
- Display an equal number of two types of coins and ask students which is more and why.

At the end of the session

- Have students sort a set of pennies and determine their value by counting by ones, twos, fives, and tens.
- Engage students in a conversation about each of the American Presidents whose faces are on the penny, nickel, dime, and quarter.
- Set up a mock store in the classroom using common objects as different coins, and have students assign values to various other objects, which they can buy and sell using these coins.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Geometry and Measurement

Unit: Geometry

Session: Triangles and Rectangles

Learning Objectives

- Interpreting a street map.
- Identifying triangles.
- Identifying rectangles.
- Recognizing squares as special rectangles.

Overview

On a tour of the city, we locate the places we want to visit on a map and identify the triangular shapes of our routes. We then visit the Art Museum, look at the floor plan, and identify rectangles and squares.

Keywords

Map

Triangle

Corner

Rectangle

Square

Teaching Strategies

Prior to the session

- Give children toothpicks or pieces of spaghetti and see how many types of closed shapes they can make.
- Have students point out the different shapes that they see in the classroom and describe their similarities and differences.

At the end of the session

- Have each student draw 3, 4, 5, and 6 points on blank sheets of paper and see how many triangles they can draw through each set of points.
- Give students sets of toothpicks and have them trace and identify as many rectangles and squares as they can.
- Have students draw or identify figures that have three sides but are not triangles, and figures that have four sides but are not rectangles or squares.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Geometry and Measurement

Unit: Geometry

Session: **Three-Dimensional Shapes**

Learning Objectives

- Exploring common three-dimensional shapes and their two-dimensional nets.
- Identifying the faces of common three-dimensional shapes.

Overview

In a candle shop, we identify the shapes of three candles and their boxes. We open out the boxes and look at the faces of each shape.

Keywords

Face

Net

Circle

Teaching Strategies

Prior to the session

- Have children bring in various containers from home and compare their properties.
- Have students flatten various paper cartons and boxes and identify the parts that make up each face.

At the end of the session

- Have students count and record the number of faces, corners, and edges on an assortment of boxes and decide what always seems to be true about a box.
- Look at pictures of the pyramids in Egypt and Mexico and have students create nets that correspond to their shapes.
- Have students bring in examples of cylindrical containers (that have tops and bottoms preferably) and cut them up to form their nets; label the parts that make up the cylinder.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Algebraic Thinking

Unit: Patterns and Displays

Session: Shapes

Learning Objectives

- Recognizing, completing and extending linear patterns involving shapes.
- Representing linear patterns using letters, such as ABC or BAC.
- Using Venn Diagrams to sort shapes according to one or more properties.

Overview

We're tiling a bathroom. We use colors, shapes, and letters to identify and complete different tiling patterns.

Keywords

Pattern

Circle

Triangle

Square

Teaching Strategies

Prior to the session

- Review the names and properties of familiar two-dimensional and three-dimensional figures.
- Have students discuss what a pattern is and find examples of repeating patterns.

At the end of the session

- Have students use sets of attribute or pattern blocks to create a repeating pattern and ask other students to describe the pattern using words.
- Ask students to identify two attributes in a set of objects, label the two loops in a copy of a black-line master of a Venn diagram, and sort the objects into each of the corresponding regions of the Venn diagram.
- Have students create and/or complete and extend repeating patterns made up of various shapes.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Algebraic Thinking

Unit: Patterns and Displays

Session: Number Patterns

Learning Objectives

- Recognizing, completing, and extending number patterns.
- Identifying missing terms in an addition or subtraction sequence.

Overview

We're looking for treasure in the mystery castle! To find the treasure, we have to identify and complete different number patterns.

Keywords

Pattern

Counting on

Counting backwards

Teaching Strategies

Prior to the session

- Talk about repeating patterns found in the calendar (months, days of the week) and in the clock (1, 2, ..., 12).
- Ask students to describe and extend various counting sequences in terms of repeating patterns, e.g. one more than, one less than.

At the end of the session

- Have students invent various number sequences, and have other students guess the underlying pattern of the sequence.
- Display a large 10 x 10 hundreds chart and have students describe as many repeating patterns as they can find, vertically, diagonally, etc.
- Use counters or cubes to represent triangular and square numbers and have students discover the number sequence of each pattern.

Lesson Plans

Course: Mastering Skills & Concepts: Course I

Module: Algebraic Thinking

Unit: Patterns and Displays

Session: **Tables and Graphs**

Learning Objectives

- Sorting and representing data in a picture graph.
- Analyzing data in a picture graph.
- Using tally marks to create a frequency table.
- Representing and interpreting data in a bar graph.

Overview

We're busy in the jellybean factory! We represent and compare the number of differently colored jellybeans using tally marks, picture graphs, and bar graphs.

Keywords

Picture graph

Tally mark

Bar graph

Teaching Strategies

Prior to the session

- Have students conduct a simple survey among members of the class and then discuss how they can record the results.
- Bring in copies of magazines or newspapers and have students clip various charts and graphs that they find and post them around the room.

At the end of the session

- Arrange the results of a student survey into a table and then use a bar graph to represent the data.
- Have students sort collections of colored candies or chips, then use tally marks in a table to record the data, tabulate the marks, and interpret the data in the table.
- Graph the results of a data survey as both a picture graph and a bar graph and interpret the results based on the graphs.