First—Second Grade Lesson Sequence
(51 Lessons)

Free Exploration and Creative Learning

Lesson One Learn the rules, establish the environment. Students experience new materials on their own. Our questions guide their thinking.
- Topic Pattern Blocks.
- Topic Power Blocks.
- Topic Geoblocks, Unifix Cubes, toothpicks, or any other available materials.

Patterns and Connections

Lesson One Learn what is meant by "pattern." Learn the A-B system of describing patterns. The whole class invents patterns, then smaller groups devise ways to share. Pattern searches extend to the environment.
- Topic A-A-B.
- Topic A-A-A-B.
- Topic A-B, A-B.
- Topic A-B-C and more.
- Topic Five minutes now and then.

Lesson Two Learn to relate A-B patterns to materials. Students create and share A-B patterns. Students also learn to check their neighbors to ensure that everybody understands.
- Topic Pattern Blocks and A-A-B.
- Topic Power Blocks and A-A-B.
- Topic Pattern Blocks and A-A-A-B.
- Topic Power Blocks and A-A-A-B.
- Topic Other materials and A-B patterns.

Lesson Three Learn how to record patterns. Students record patterns and use the recordings of others to reproduce and extend the patterns.
- Topic Pattern Block A-B patterns recorded.
- Topic Pattern Block A-B patterns copied and extended.
- Topic Power Block A-B patterns recorded.
- Topic Power Block A-B patterns copied and extended.

Lesson Four Learn to look for patterns in numbers. Students look at number charts for patterns and describe the patterns they see.
- Topic 00-99 matrix.
- Topic 1 -100 number strip.

Lesson Five Learn to extend pattern searches beyond the period set aside for math. Learn to connect mathematics to art. Students create pattern designs for themselves.
- Topic Pattern Block walls.
- Topic Pattern Block mosaic designs.
- Topic Graph paper patterns.
- Topic Other patterned art we might choose to use.

Beginning Number

Lesson One Learn to count up and back by ones. We establish a counting environment.
- Topic Counting up.
- Topic Counting back.
- Topic Counting every time there are things to count.

Lesson Two Learn to look for patterns in the counting numbers. We post numbers for students to search for patterns.
- Topic Search the numbers from 0 to 100 again for patterns.
- Topic Learn to say the names of numbers.
- Topic Look at the 00-99 matrix once again.

Lesson Three Learn the difference between 1, 2, 3 and 1st, 2nd, 3rd. We use numbers in language to convey meaning.

Topic Language use is not lesson bound. The use of cardinal and ordinal numbers is done consciously everyday.

Lesson Four Learn the fiveness of five. We surround our students with the concept of numbers from three to as far as we decide to go.
Topic 3 with squares.
Topic 3 with tooth picks.
Topic 3 with wooden cubes.
Topic 3 with Pattern Blocks.
Topic 4 with squares.
Topic 4 with tooth picks.
Topic 4 with wooden cubes.
Topic 4 with Pattern Blocks.
Topic 5 and more with each material, in turn.

Lesson Five Record the number concepts learned in Lesson Four. Students learn a different way to record each material. The recordings have a use in Lesson Six.
Topic The lesson focus is on recording.
Topic Recording 3 with squares.
Topic Recording 3 with tooth picks.
Topic Recording 3 with Pattern Blocks.
Topic Recording 4 with squares.
Topic Recording 4 with tooth picks.
Topic Recording 4 with Pattern Blocks.
Topic Recording 5 and more with each material, in turn.

Lesson Six Record in words and numbers while learning to envision what the words and numbers mean. Students imagine then write words and numbers to describe numeric designs.
Topic Writing words for recordings of 3 squares.
Topic Writing numbers for recordings of 3 squares.
Topic Writing words for recordings of 3 toothpicks.
Topic Writing numbers for recordings of 3 toothpicks.
Topic Writing words for recordings of 3 Pattern Blocks.
Topic Writing numbers for recordings of 3 Pattern Blocks.
Topic Repeating the two step writing cycle for the numbers 4 and 5.

Lesson Seven Learn the families of addition facts. Students look for ways to make number combinations with Unifix Cubes.
Topic Creating number combinations with Unifix Cubes.
Topic Creating flash cards to accompany the cubes.

Sorting, Classifying, Expanding Language

Lesson One Learn to sort by attributes. Students sort objects into groups in a variety of ways. Teacher or students list the ways.
Topic Each new material produces a variation of the basic lesson.
Topic Sorting buttons, making lists.
Topic Sorting keys, making lists.
Topic Sorting whatever else is available in quantity.

Lesson Two Learn to be aware of attributes everywhere. Students take sorting walks to learn to see what is already there.
Topic Sorting walks.
Topic Each walk taken is a different topic.

Lesson Three Use sorting and classification knowledge to create informal definitions of words. We sort shapes, words, or objects as students create definitions for the sorts.
Topic We use this lesson when we have a definition we wish to teach.
Topic Shapes—quadrilaterals, triangles, squares, etc.
Topic Nouns, verbs, prepositions, adjectives, etc.
Topic What other definitions might we choose to use?

Lesson Four Learn to find relationships between different shapes. Students play games with Attribute Blocks that focus on thinking logically and systematically.

Topic Pattern sorts, teacher at the overhead.
Topic Identify the missing piece.
Topic Which piece does not belong?
Topic Add a piece to the line that is one different than the piece before.

Geometry, Shapes, Relationships and Constructions

Lesson One Provide a background in geometry equally for boys and girls, rich and poor, while exploring shapes in geometry. Students build as our questions focus their discoveries.

Topic Today is building day, let's see what you can build.
Topic Lego blocks, Tinker Toys, Geoblocks, Pattern Blocks, Power Blocks, straws, toothpicks and clay. Each material used for building is a different topic.

Lesson Two Expand the exploration of shape. Students explore the properties of shapes guided by the questions that we ask.

Topic Power Blocks, what shapes make other shapes?

Lesson Three Learn to recognize reflective symmetry in shapes. Students explore lines of symmetry with materials and mirrors.

Topic Free exploration with mirrors.
Topic Pattern Blocks and mirrors - exploring symmetry.
Topic Power Blocks and mirrors - exploring symmetry.
Topic Free exploration with hinged mirrors.
Topic Symmetry with Pattern Blocks and hinged mirrors.
Topic Symmetry with Power Blocks and hinged mirrors.

Lesson Five Learn that math and art are not separate subjects. We teach art as we always do. In Patterns & Connections, Lesson Five, we pointed out the patterns to be seen. We now point to the geometric connections to be made, as well.

Topic Name symmetry.
Topic Snow flakes.
Topic What math can we see in other art that is a part of the art we teach?

Lesson Nine Learn to be aware of the geometry in our lives. We ask our students to look more closely at what they already see.

Topic Make a list of rectangular shapes. What other shapes can we list?
Topic What shall we look for today? Why are the things that we see the shape that they are?

Lesson Ten The purpose is a teacher purpose. Our assignment is to find the opportunities. We make ourselves aware of the opportunities for geometric experiences that exist. We use the opportunities that we find.

Topic Opportunities that we find.

Beginning Addition and Subtraction

Lesson One Learn to create and check addition problems. Students create addition problems that they can check by counting.

Topic Creating addition problems with handsful of squares.
Topic Creating addition problems with handsful of squares and checking the answers with calculators.

Lesson Two Learn to apply the skills of addition. We give our students problem-solving questions and number patterns to explore with squares and Unifix Cubes.

Topic Problems in the middle of a stream.
Topic Odd and even numbers.

Lesson Three Learn to create and check subtraction problems. Students create subtraction problems that they can check by counting.

Topic Creating subtraction problems with handsful of squares.
Topic Creating subtraction problems with handsful of squares and checking the answers with calculators.

Lesson Four Learn to apply skills of subtraction. We give our students problem-solving questions and number patterns to explore.
- Topic Starting with 100.
- Topic Problems in a stream, a negative flow.

Lesson Six Learn to solve word problems that the teacher creates. Students learn to draw the necessary numbers from the stories that we tell.
- Topic Word problems for adding.
- Topic Word problems for subtracting.
- Topic Adding and subtracting mixed.

Lesson Seven Learn to create and solve story problems. Students create their own stories to go along with numbers. First the teacher provides numbers, then numbers are taken from student lives.
- Topic Students create addition stories to share.
- Topic Stories are shared before the next addition creations are produced.
- Topic Students create subtraction stories to share.
- Topic Stories are shared before the next subtraction creations are produced.
- Topic Addition and subtraction are mixed.

Lesson Nine Learn to connect school math to life. We look for problems that exist around us for our students to solve.
- Topic Twenty problems or just one.

Graphing, Probability and Statistics

Lesson One Learn to use graphing as a tool for finding answers to questions. Students learn to turn their curiosity into data to graph. Graphs made now will be used again in Lesson Four.
- Topic Students make graphs in response to questions asked or curiosity expressed that leads to numbers that can be represented pictorially.

Lesson Two Learn how to display information in a variety of ways. Students invent more ways to graph data than they had thought to use before.
- Topic Examples of different kinds of graphs are shared as students think of ways to graph they have not used before.

Lesson Three Learn how to ask questions for a graph. We assemble unseen graphs to guide students in learning how to ask what it is they want to know.
- Topic A graph is assembled behind a shield as students ask questions about data that remains unseen.

Lesson Four Learn to ask questions for the graphs that students make and see. Students learn to add written questions to their graphs. The lesson on asking questions is also a lesson on learning to speak math and learning to ask math questions.
- Topic Students add questions to graphs already made.

Measurement, Estimation and Time

Lesson One Learn that measurement is a part of everything we do. We create a measuring environment in our room by making measurements a tool for finding out.
- Topic Measurement is in the environment we create.
- Topic Measurement is in the questions that we ask.
- Topic Measurement is in "Is taller than...".

Lesson Four Learn about time. In general, we teach time buy using it.
- Topic Time is an experience. It is taught all day long, all the time.

Lesson Five Learn how to make good estimates. Students estimate length, surface area, weight and volume while learning what estimation means, but we do not teach estimation and then move on. Estimation is a thinking skill our students use and use. We make estimation a part of all the lessons we teach by the questions that we ask.
- Topic How much?

Topic How high?
Topic How many?
Topic How far?
Topic How soon?
Topic What else?

Beginning Multiplication and Division

Lesson One Learn what it means to multiply. Learn to search for patterns in multiplication arrays. Students learn to create and record (individually and in matrices) multiplication problems. Matrices are searched for patterns.
Topic Making and recording rectangles with squares.
Topic Recording rectangle patterns on matrices.
Topic Examining matrices for patterns.
Topic Add the matrix to the wall charts for pattern searches endlessly.

Lesson Two Learn to create multiplication and division problems, with and without remainders. Students create and solve problems in a sideways L and answer three basic questions that we ask.
Topic Create problems, ignore remainder. Create problems for each other. Create problems, remainder not ignored.
Topic Create times problems with hands full of squares, remainders are ignored.
Topic Answer three questions for the sideways L, no remainders yet.
Topic Remainders added in.
Topic Three questions asked again.

Lesson Three Learn to look for non numeric patterns. Learn to connect the non numeric patterns to numeric patterns seen before. Students create patterns with Unifix Cubes, break the patterns apart and study the "break-aparts" for patterns.
Topic Break-apart pattern searches.

Lesson Five Learn to think about what the numbers in multiplication and division problems represent. We create multiplication and division problems that our students solve, as they identify what the numbers in their answers represent.
Topic Multiplication word problems created with people and objects in the room.
Topic Division word problems created with people and objects in the room.

Lesson Six Learn to create stories for multiplication and division problems. Learn to see the stories in numbers everywhere. Students write or draw stories for numbers we provide. Students look for number stories in their own lives.
Topic Students write stories or draw illustrations to accompany multiplication and division problems.
Topic Selected stories written one day are read as creative inspiration the next.
Topic Students write stories or draw illustrations to accompany multiplication and division problems that they provide.

Lesson Seven Learn that problems to be solved are everywhere around. Students seek the multiplication and division problems that already exist in their lives.
Topic Students describe number situations that exist. Finding the answers to the situations is not required yet.
Topic Selected problems from the situations found are solved by the class.

Fractions, Ratios, Money, Decimals and Percent

Lesson Twelve Learn about money from using it. We use real money and real money situations to teach our students how to find real money answers. Money is taught best at home.
Topic Milk money, restaurant menus, classroom store, fundraising events: any opportunities that arise provide the framework for the money lessons that we teach.

Advanced Addition and Subtraction

Lesson One Learn to search for patterns in bases other than ten. Student record and examine plus one and minus one patterns in different bases.

Topic Squares and cups: base 4, base 5, base 6, if needed base 3. Then squares, cups and bowls as the base cycle is repeated. Then Base ten.
Topic + and - 1 with squares and cups, base 4.
Topic + and - 1 with squares and cups, base 5.
Topic + and - 1 with squares and cups, base 6.
Topic + and - 1 with squares and cups, base 3.
Topic + and - with squares, cups and bowls, base 4.
Topic + and - with squares, cups and bowls, base 5.
Topic + and - with squares, cups and bowls, base 6.
Topic + and - with squares, cups and bowls, base 3.
Topic + and - with squares, cups and bowls, base ten.

Lesson Two Learn about adding or subtracting numbers greater than one in different bases. Students play racing-up and racing-back place-value trading games.
Topic Racing up in base 4, winner is the first up.
Topic Racing up in base 5, winner is the last up.
Topic Racing up in base 6, winner is the first up.
Topic Racing up in base 3, winner is the last up.
Topic Racing up in base ten, winner is either the first or last up, decided in advance.
Topic Racing back in base 4, winner is the first back.
Topic Racing back in base 5, winner is the last back.
Topic Racing back in base 6, winner is the first back.
Topic Racing back in base 3, winner is the last back.
Topic Racing back in base ten, winner is either the first or last up, decided in advance.

Lesson Three Learn the concept of place value. Students learn a game that teaches them the value places have.
Topic Place value game in base 4, most wins.
Topic Place value game in base 5, least wins.
Topic Place value game in base 6, most wins.
Topic Place value game in base 3, least wins.
Topic Place value game in base ten, either most or least wins, decided in advance.

Lesson Four Learn to create addition and subtraction problems in any base three through ten. Students learn how to create addition and subtraction problems and how to find and check the answers to the problems they create.
Topic Addition problems are created in base 4.
Topic Addition problems are created in base 5.
Topic Addition problems in any base 3 to 6.
Topic Subtraction problems are created in base 4.
Topic Subtraction problems are created in base 5.
Topic Subtraction problems in any base 3 to 6.
Topic Addition problems are created in base ten.
Topic Subtraction problems are created in base ten.

Lesson Seven Learn that addition and subtraction are tools for finding out. Learn to apply math skills to problems in real life. We work with our students to find and then solve real problems that use the skills that our students possess. Students keep a written record of their work.
Topic Problems drawn from stories.
Topic Problems drawn from questions.
Topic Problems drawn from life.

Lesson Eight Learn to look for patterns in numbers everywhere. Students look for patterns between bases and in ordinary events.
Topic Compare plus one strips from different bases.
Topic Examine situations for patterns.

Lesson Nine Learn that creativity and inventiveness are problem-solving tools. Our students use their inventiveness to solve problems that we give and share their individual or collective inventiveness with everyone in class.
Topic Kids in class, kids in school.