

Hopscotch Math

An Interaction Unit With Hopscotch Patterns for Learning
Multiplication and Division Facts



About the author

Paul Schroeder earned his B.S. degree in elementary education at Mayville State in Mayville, North Dakota. He currently teaches third-grade elementary students in Nevis, Minnesota, and he has also taught Chapter 1 and sixth-grade students. His varied teaching environments enabled him to develop this experiential unit.

Paul would like to dedicate this work to all the students who struggled with multiplication and division facts in his elementary math classes over the years. These students are the ones who motivated and challenged him to find an easier way, a more enjoyable way, a “Hopscotch” way to learn math.

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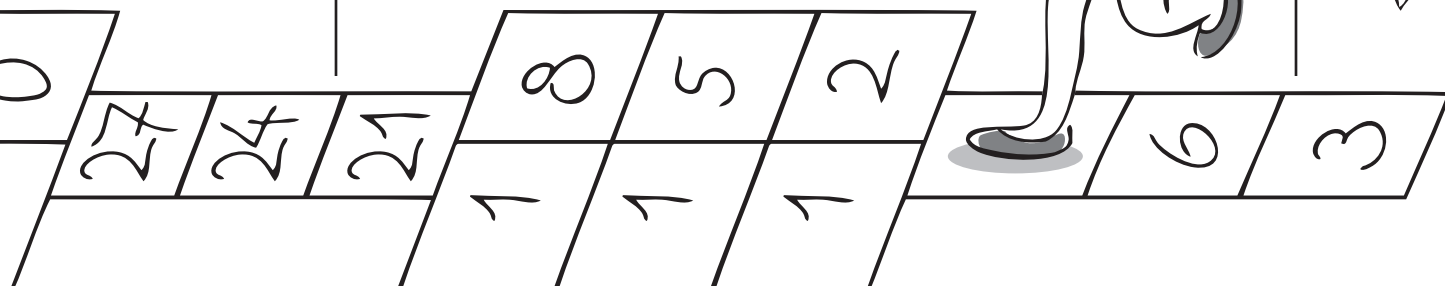
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WELCOME TO HOPSCOTCH MATH!

Get students multiplying and dividing with this active participation unit. Each lesson teaches concepts through short stories, phrases, or an activity. Things get hopping as students have fun jumping through hopscotch patterns reciting their multiples. Reproducible Student Learning Logs provide a chance for students to reflect on how and what they have learned. Students keep a daily journal and take pre and post tests to chart their progress. As designed, the unit runs for 18 class periods; time varies based on practice time allotment.



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Purpose

Teaching multiplication and division can often be a frustrating experience. The concepts of multiplying and dividing seem to be difficult for young students to grasp. In addition, for some students memorizing multiplication and division facts can be next to impossible. *Hopscotch Math* is a new approach that assists in alleviating some of these barriers. Specifically your students should experience the following:

Knowledge

1. Signs for multiplication and division
2. Uses of multiplication and division
3. Strategies for learning multiplication facts
4. Reversibility of multiplication facts

Skills

1. Multiplying single digit numbers
2. Dividing with single digit divisors
3. Working cooperatively
4. Tutoring one's peers
5. Strategizing to find correct answers to multiplication and division problems
6. Writing summaries describing knowledge gained
7. Charting individual progress on multiplication facts

Attitudes

1. Feeling positive self-esteem because of ability to solve multiplication and division problems
2. Sensing the satisfaction gained while working cooperatively with classmates
3. Gaining confidence and satisfaction from peer teaching
4. Appreciating how a parent cares and helps with math work taken home for practice

Overview

Something special: At the moment others walk into your *Hopscotch Math* classroom, they will know there's something special going on. They will see hopscotch patterns taped on the floor or placed on the carpet. Visitors will feel the energy as students are hopping on the patterns and reciting their multiples at the same time. The room will be charged with excitement, and this is before the school day even begins!

Just as training wheels are a valuable tool for learning how to ride a bike, *Hopscotch Math* is a valuable tool for learning multiplication facts. Sure, they might be a little wobbly at first, but with some practice and time, they gain confidence and the skills they need and soon the training wheels come off. *Hopscotch Math* works the same way for students learning their multiplication facts. With some practice and time, students will no longer need *Hopscotch Math*, as they've gained the confidence and the skills to know all of their multiplication facts by sight.

Having students know their facts by sight should be your ultimate goal and should always be encouraged, just as a child's ultimate goal is to ride a bike without training wheels. With that said, *Hopscotch Math* will be there to help support and guide students until they are able to learn all of their multiplication facts by sight.

Consequences: *Hopscotch Math* is designed to add interest and stimulate students so that they will enjoy taking an active part in learning their multiplication and division facts. With help from this unit, students learn patterns, short stories, and/or phrases that directly relate to their comprehension of their multiplication facts—2 through 9. Students will transfer these skills and knowledge as they complete multiplication and division worksheets, use **Flash Cards**, and eventually do well on multiplication and division exams. They will also track their progress and their knowledge of their multiplication facts by filling out personal progress charts and writing journal pages in their Student Learning Log.

Lessons: *Hopscotch Math* has a total of 8 lessons (mini-lectures), each of which lasts approximately 1 hour:

1. What is multiplication?
2. Multiples of 3
3. Multiples of 4
4. Multiplying by 2
5. Multiplying by 5
6. Multiplying by 9
7. Multiplication of 6s, 7s, and 8s (the shortcut)
8. Division and *Hopscotch Math*

Amount of time: The number of days all lessons will take to complete will depend on the amount of time taken between the lessons for practice and peer tutoring. The Unit Time Chart offers a guideline for covering all multiplication and division facts, including extra review days. Decide how closely you will follow this Unit Time Chart, but feel free to add more time for practice as needed.

Having learned all their multiplication facts and the relationship between multiplication and division, students will not perceive division as a separate or difficult concept.

Other materials: Feel free to choose some appropriate textbook or other supplementary materials to use along with *Hopscotch Math*.

How does *Hopscotch Math* succeed?

- **Learning styles:** The unit effectively incorporates auditory, visual, and kinesthetic learning styles.
- **Mnemonics:** Using stories and phrases that complement the unit's pictures and patterns, students have a special way of remembering their multiplication facts.
- **It is fun!:** Students are learning their multiplication and division facts while hopping, but please do not tell them their hopping is a form of studying. They just think it is fun!

Test results: For me as a teacher *Hopscotch Math* has been an effective tool that has improved my students' test performances. We at Interact expect your students to have similar success. Good luck!



Teaching tip

Check out Interact's simulation *Lost Tribe of the Tocowans*: Third- to fifth-graders travel in jeeps searching for a lost tribe on the imaginary Bahacan Peninsula. They practice multiplication and division skills in order to decipher Pictographic Cards which give clues for solving an intriguing mystery.



Setup Directions

Before beginning

1. **Ensuring understanding:** Carefully study this Teacher Guide so you understand *Hopscotch Math* before you carry out these Setup Directions.
2. **Choosing optional supplementary materials:** Decide which math worksheets and/or textbook pages you wish to use as supplementary activities for *Hopscotch Math*.
3. **Duplicating miscellaneous materials**
Here are some other items to duplicate for this unit.
 - a. Multiplication Exam (class set)
 - b. Division Exam (class set)
 - c. All Certificates (as needed)
4. **Duplicating Flash Cards:** (see pages 28–33) The Daily Directions explain times when students are to “practice.”
 - a. Whether they practice their **Flash Cards** in pairs or in groups is your decision.
 - b. Of course, if you wish your students to take **Flash Cards** home for practice, you must duplicate a set for each student. This is what I do with my students, and the suggestion I recommend.
5. **Completing Flash Cards:**
 - a. Cut out each **Flash Card**.
 - b. Cut out colored tag board pieces that are approximately half-inch larger all around than the **Flash Cards**.
 - c. Glue each flash card to a piece of tag board
 - d. Be sure to place the answer on the back of each **Flash Card** before laminating it.
 - e. Laminate all **Flash Cards**.
6. **Organizing Flash Cards**
 - a. Having specific **Flash Cards** placed in a special place and ready to hand out as explained in the Daily Directions for a certain day will expedite the lesson.
7. **Another Option:** You might chose to have students make their own flash cards from blank white cardstock (flash card size and cut out by you or an aid prior to instruction). After each lesson simply have students write the problem on one side in crayon and the answer very small on the back right-hand corner in pencil. In doing it this way, you can actually have two problems on each card. An added bonus is that the cards become personalized.



Important!

Choose one of these duplication options:

- one set per student;
- one set for every two students; or
- one set per group.



Teaching tip

If your school's paper budget has not been stretched too far, I really recommend that you give each student a set of **Flash Cards** to take home.



Teaching tip

If you do choose this method, make sure students put their initials in the top right corner in pencil.

Teaching tip

From now on in this Teacher Guide, the **Student Learning Log** will be referred to as the SLL.



Using the Student Learning Log

The **Student Learning Log** (SLL) is a central part of *Hopscotch Math*. Follow the suggestions below as you prepare and use the SLL notebook.

The Student Learning Log (following page 46 in this Teacher Guide)

If you chose the option to purchase the SLL separately from Interact, skip the duplicating directions in the next paragraph.

Duplicating the Student Learning Log

If possible, duplicate the SLL on back-to-back sheets in order to save paper and space in the SLL notebook referred to in the next paragraph. Of course, if your school duplicating machine does not duplicate back-to-back, duplicate the SLL one side only.

Creating the Student Learning Log three-ring notebook

With school or parental financial support, obtain three-ring notebooks for all students. Once they have their individual notebooks, help them place their SLL inside their notebooks.

Using the Student Learning Log three-ring notebook

1. **Coloring the cover:** After your students have placed their SLL pages into their three-ring notebooks, call their attention to its cover. Suggest that they consider coloring its title page with colored pens or crayons. Later other pages' illustrations will attract students to use color to accent their work.
2. **Learning Log?:** Ask them to speculate on why the SLL has been named a "learning log." Ask them to speculate on definitions of the word. Lead them to understand that a learning log is a place where they will record what and how they learned about multiplication and division skills over a certain time period.
3. **Highlighter pens:** Hold up in front of your students yellow (or other colored) highlighter pens. Then demonstrate how to use these pens to emphasize key points. Stress that the SLL will become *theirs* if they personalize it with their own markings.
4. **Parents:** In a special letter—or during your Open House presentation—explain to parents your desire for a school-home connection with *Hopscotch Math*. Point out how the SLL can be a means to achieve this goal. Examples you might point out as you go over the SLL in detail appear on the next page.

Teaching tip

Do not cover all these suggestions on the day your students begin using this program. Present these ideas about the SLL over time as your class becomes increasingly familiar with *Hopscotch Math*.



Parents, students, and the Student Learning Log

1. **Reflecting on the SLL:** Students can place pages in their SLL upon which they write about difficulties and successes they are having. Later they can go over these thoughts with a parent, classmate, or teacher.
2. **Completed work:** Obviously students should keep assigned and extra work in their SLL. If they begin getting quite a few pages, have students set up tab sections in which they can organize their work.
3. **Tests and certificates:** Students will want to keep both here as evidence of their success or as motivation to work harder.
4. **Time spent with family:** Parents and students will be proud if students log the amount of time they spend on *Hopscotch Math* activities. Possibly you will wish to reward students some way for time spent working at home with a mom, dad, or sibling.
5. **Photographs:** Snapshots will enhance #4 above.
6. **Progress Charts:** Have students fill in these charts—page 27 in their SLL—on review days. (See the Unit Time Chart on the next page.)
7. **Working with younger brothers and sisters:** Anyone who has grown up in a family with several children knows how much younger siblings learn from older brothers and sisters. Encourage students to do such teaching. A proud student could even bring in a short video of a precocious 6-year-old happily hopping and shouting his/her knowledge of patterns. Encourage students to draw the 3s and 4s pattern in the dirt, on a sidewalk, or even in the snow. Suggest they start hopping outside their home with a younger sibling or neighbor. Guess who will soon be hopping!
8. **Keeping the SLL for the future:** Be sure you encourage students to keep their SLL as something they will enjoy looking at and then showing to their children some day when they have become parents.
9. **Ideas from you:** I would appreciate your sending me c/o Interact other examples of ways your students and their parents have used their SLL.



Important!

Make certain students place on all their work the dates when they completed the work. By dating every SLL Item, they will have an accurate record of their learning progress.



Teaching tip

My students have been imaginative in placing hopping patterns in several environments.