

Square scotch?

Experiment Express

STEM Field of Study

Math

Specific STEM Area

Addition

Subtraction

Multiplication

Division

Age Group

All

Cost

\$0 - \$5

Time

45 minutes

Materials

Chalk, Ground, Volunteers to Play

Safety

It's a good idea to have an adult nearby

IEP Goals

Academic

Behavioral

Motor

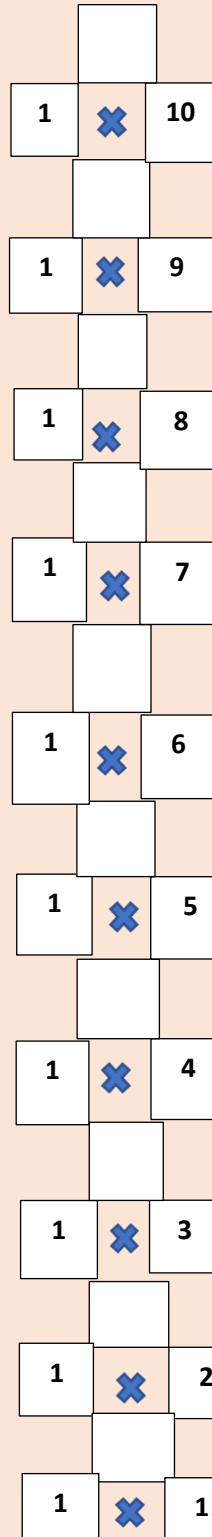
Question:

Can you learn multiplication by doing hopscotch?

Hypothesis:

Before you do this experiment; try to predict the answer to the question above. Write down your Hypothesis in your logbook

Instructions:



1. Gather all your materials together.

2.  Review all Safety Precautions.

3. Remember – Multiplication is about groups. For example if you have 3 baskets and 2 oranges in each basket how many oranges do you have? 3 baskets x 2 oranges in each basket = 6 oranges.

4. To play Squarescotch you need plenty of space to recreate the pattern on the left. Redraw the pattern as you see here. The blank squares are the answer squares and you do not write in those squares – you leave them blank. The only squares that change are the ones with numbers in them. You can write any numbers you want in the number squares.

5. Next, make sure everyone who is playing has their own special rock to use to play Squarescotch.

6. After you are done drawing the pattern and inserting the numbers you are ready to begin playing. The order of players is dependent upon age. The youngest goes first and the oldest goes last.

7. The first player rolls their rock over the Squarescotch pattern. And just like hopscotch you hop your way to the location of the rock. Two feet where there are two boxes and one foot where there is one box.

8. The player has a choice to either do the problem immediately before their rock or immediately after. If the answer is correct you earn the points that are equal to the answer. If the answer is incorrect – you earn nothing and lose one turn.

9. Keep playing until the bus arrives for school and who ever has the most points by the time the bus arrives – Wins!

10. The faster you go – the more you will know!



Square scotch?



Post Experiment Questions for Adults to ask:

1. Which multiplication problems were the easiest for you to remember?
2. Which multiplication problems were the most difficult for you to recall?
3. Do you think you could play Square Scotch with addition, subtraction, or division problems?
4. How many multiplication problems were you able to complete correctly before the bus arrived?
5. Was your hypothesis correct?

Let's talk!

Discussion of Results / Post Experiment Answers:

1. Answers will vary; however, it is important to review the multiplication problems they completed correctly.
2. Answers will vary; however, this is a unique opportunity for your student to recall and review the problems they solved incorrectly.
3. Absolutely! This is a fantastic opportunity for addition, subtraction, and division problems.
4. Answers will vary – but it is time to celebrate correct answers and effort.
5. If your hypothesis was correct – Congratulations! If not, do not worry – just keep trying!



Draw your own conclusion:

In math there are some unique guidelines that are called “properties.” One of the properties specifically for multiplication and it is called: The Commutative Property of Multiplication. It sounds very fancy and complicated does not it? But really all that it means is you can change the order of the numbers in a multiplication problem and the answer will be the same.

For Example: If you had the problem 1×3 – the answer would be: 3. If you reverse the problem to 3×1 – your answer will be the same – 3. So, in multiplication problems it does not matter what order the numbers are in – The answers will remain the same! Isn't that cool? It makes it a lot easier to remember your times tables that way.

There is also the Commutative Property of Addition.

This means if you are adding two numbers – it does not matter what order the numbers are in – your answer will be the same.

Think about it!

Our question to you is – Can you use the Commutative Property for Division and Subtraction problems? Why or Why not?



Expansion Experiments:

Need a bit of a challenge? Try these suggestions:

1. Use larger numbers (factors) to multiply.
2. Use only one number and write the answer in the blank square – then the players must guess at what the missing number is.

Log your work:



Go for it!

You can always write down the multiplication problems you answered correctly and the problems you need to work on.

Real World Application:



Science

Engineering

Technology

Daily life skills

Construction

Additional Resources:



Humble Math - 100 Days of Timed Tests: Multiplication: Grades 3-5, Math Drills, Digits 0-12 by [Humble Math](#)

www.khanacademy.org/

Multiplication and Division Math Workbook for 3rd 4th 5th Grades: Everyday Practice Exercises, Basic Concept, Word Problem, Skill-Building practice by [Bear Fairy Education](#)

