AT HOME LEARNING

4th Grade Summer Packet

Math

Activity 1: Laced Plates
On a paper plates, put x and then a number 1-12. Ex. x3=times 3.
Put 12 hole punches are the edge. Place the answers randomly next to each hole. Use a string to move to each answer start at one times, two times, three times etc.

Activity 2: Spiral Multiplication
A fun twist on practicing multiplication facts with only a deck of cards. Directions attached.

Reading/Writing

Activity 1: Try a new product or activity and write about it. How would you describe it? Would you recommend it? Create an advertisement to sell it to others.

Activity 2: Using your leaf animal and list of traits. Write a paragraph about what a normal day would be like for your leaf animal. Be creative!

STEM Activities

Activity 1: Bottle Rockets
Create a bottle rocket using a pop bottle. Attachment for directions.

Activity 2: Leaf Animals
Collect leaves and see what kind of animal you can make. Give it a name and 8-10 traits.

Math

Activity 1: Multiplication War
Each player turns over 1 card at a time and multiplies the 2 cards drawn. First person to identify the correct product keeps the cards in their "win" pile. Player with most cards at the end of the game is the winner.

Activity 2: Array Capture
You will need graph paper, a crayon, and a dice. She who can fill in all or the most boxes first! Directions attached.

Reading/Writing

Activity 1: Write a comic strip about a fictional character or yourself. See how long you can keep the strip going. Read classical comics for inspiration.

Activity 2: Read a book. Write a book review that gives your opinion of the book. Be sure to include a summary of the book, what you liked and did not like about the book, and use details from the story to support your opinion.

STEM Activities

Activity 1: Lava Lamp
You will need a clear glass, water, oil, food coloring and an Alka Seltzer tab. Directions attached.

Activity 2: Tissue Box Catapult
How far can you catapult objects around the house? Directions attached

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AT HOME LEARNING

4th Grade
Summer Packet

Math

Activity 1: **Multiplication squares**
Print out the game board and grab two dice. A fun spin on the game dots while practicing multiplication facts. Board and directions attached.

Activity 2: **Relay Race**
Use or create flashcards with addition, subtraction, multiplication, and division problems to solve. Create a course outside. At each stop, you must answer the problem correctly to move on to the next part.

Reading/Writing

Activity 1: Read one chapter or use a whole book. Draw pictures and sentences to create and tell the sequence of events in the story.

Activity 2: **Secret Messages**
Use the secret code attachment to write a letter to someone in your family. Have someone else write a message for you too. Next, decode each other's messages to find out the secret!

STEM Activities

Activity 1: **Marble Run**
Use paper plates, toliet paper rolls, scissors, tape, and other items around the house to design a marble run.

Activity 2: **Build a raft**
Build a raft out of straws and tape. Set your raft in a tub of water and see how much weight it can hold using items around the house and outside.

Math

Websites:

www.mathblaster.com

https://www.mathplayground.com/

https://www.multiplication.com/games/all-games

www.abcya.com

http://www.sheppardsoftware.com/math.htm

Reading/Writing

Websites:

https://www.storylineonline.net/

https://www.storyplace.org/front

http://www.eduplace.com/tales/

https://storybird.com/

https://www.makebeliefscomix.com/

STEM Activities

Websites:

www.code.org

https://www.codemonkey.com/

https://www.nasa.gov/kidsclub/index.html#.VIWzXzHF-So

https://pbskids.org/cyberchase/activities/
http://stem-works.com/activities

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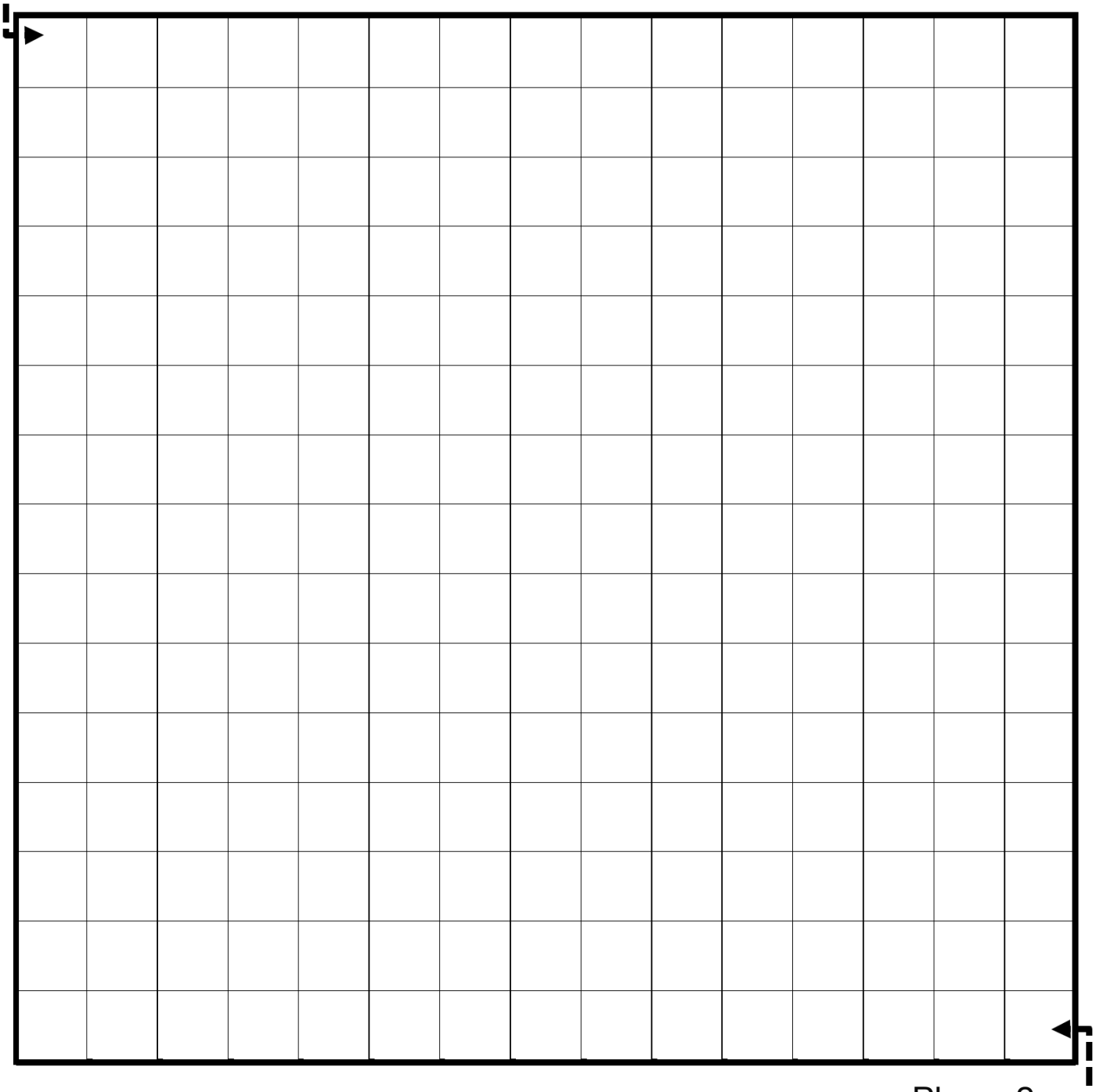
Array Capture

Materials: 1 game board, 2 dice, 2 different color markers (one for each player)

1. Player 1 rolls both dice. Those numbers will be the dimensions of an array. Player 1 draws the array (using his or her chosen color) and writes the multiplication equation inside (i.e. 4 x 5 = 20)
   *On the first turn, the array must start at the labelled corner. After that, all future arrays only need to be touching one side of an existing array belonging to that player.
2. Player 2 rolls, draws an array using the dimensions from the dice, and writes the multiplication equation inside. *On the first turn, Player 2 must start in the labeled corner.
3. If a player cannot create an array, because there is no space left, then that player loses a turn.
4. The player to “capture” the most squares wins!

Player 1



Player 2

Array Capture

Write down the multiplication equation for each array. Total the products at the end of the game to find the winner!

Player 1's Arrays	Player 2's Arrays

Multiplication SQUARES

How to Play

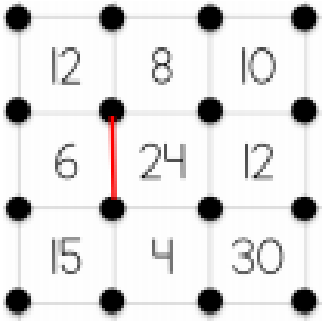
Preparation and Materials:

1. Print out the Multiplication Squares board. You will need one board per game.
    - **PAPER-SAVING TIP:** Laminate the board and use thin dry erase markers to play. That way, students can erase their marks and use the same board each time.
2. Get 2 dice.
3. Get a different colored marker for each player.

Object of the Game: To be the player who captures the most squares.

Playing the Game:

1. Each player rolls one dice. The player with the highest roll goes first.
2. The player rolls both of the dice on the table and multiples the two numbers together. For example, if the player rolls 6 and 4, he/she multiplies 6 and 4 to get 24.
3. The player looks for the product of the two dice on the squares board, and draws ONE line by connecting any two dots that are surrounding that number, as shown below. The player's marker is used to draw the line between the dots.



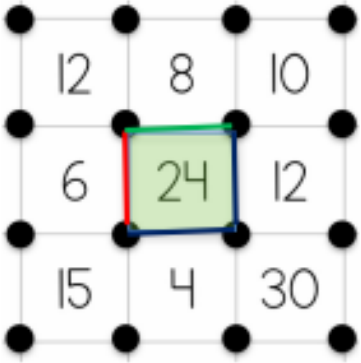
For a roll of 6 and 4, the player may find one of the 24's on the squares board. The player may connect any two dots on any side surrounding the 24.

© 2016 Games 4 Gains, LLC

https://games4gains.com/blogs/teaching-ideas/multiplication-squares-game

How to Play (continued)

4. After the player draws his/her line, that player's turn is over and the next player's turn begins.
5. Players are always striving to draw a line that will complete a square. When one player draws a line that completes a square, that player colors in the square with his/her marker and gets to take another turn with the dice.



The player with the green marker drew the top line that completed the square around the 24 and colored the square green to show that he captured that square.

Note: The player with the green marker could have rolled a product of 8 (above the 24). Because the player's line on the 8 would have completed the 24 square, he still would get to capture the 24 square.

6. If a player rolls a product that has no more available lines left on the board, the player's turn is over and play continues with the next player.
7. The game ends when all dots on the board have been connected (or when the teacher calls time). The player with the most captured squares is the winner.

Print out next page to play.

Multiplication SQUARES

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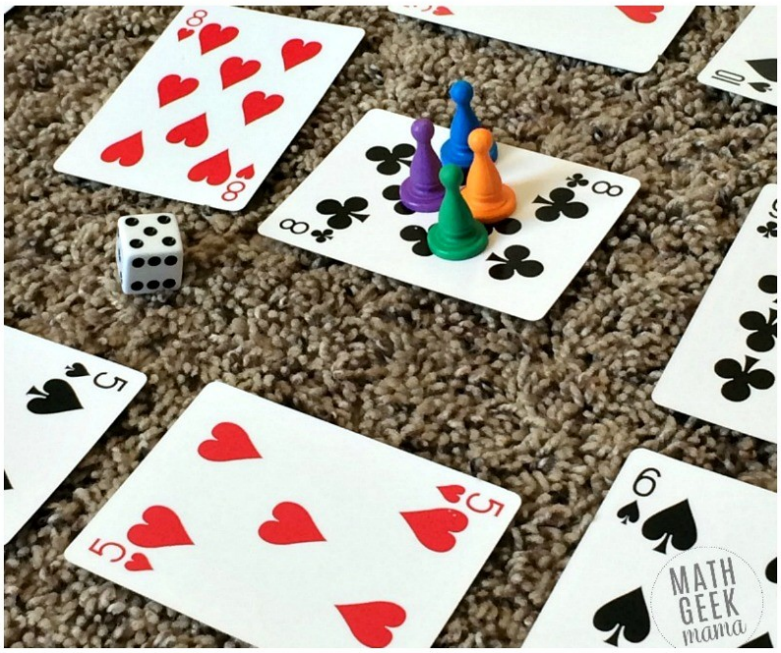
4	10	24	3	12	4	25	2	15	20
20	30	36	8	15	5	18	30	12	9
18	5	1	24	20	25	6	1	24	8
12	16	25	6	36	3	36	5	4	24
2	9	24	18	12	8	10	4	15	12
5	15	4	30	6	24	12	2	18	3
8	20	36	5	15	4	30	1	3	12
24	6	20	2	18	25	15	6	20	10
3	30	10	30	15	9	6	5	18	4
12	5	16	24	8	3	30	12	10	16

Who will capture the most squares?

Spiral:
Quick & Easy Math Facts
Card Game



https://mathgeekmama.com/multiplication-for-kids-game/

Easy Game to Practice Multiplication for Kids:

Today's game is called **Spiral**, and it's perfect for **third-fifth grade**. (Though it can be adapted for younger kids if used for addition and subtraction).

Skills Focus:

Multiplication (or other operations if you'd prefer)

Materials Needed for Spiral: Math Card Game for Kids

- Deck of playing cards
- Game pieces for each player (unifix cubes, board game pieces, beads, etc.)
- 1 or 2 dice (or a 12-sided die)

How to Play Spiral:

Get a quick overview with this video (*but be sure to see variations below!*):

The object of this game is to be the first to travel from start to finish.

Start with a complete deck of cards, as well as 1-2 dice and game pieces for each player. Ace = 1, Jack = 11, Queen = 12 and King = 13.

For younger kids, you may want to have an index card with these values written down for their reference so they don't have to remember or try to figure it out.

To begin, **build a spiral** out of the entire deck of cards, as shown in the picture below. This will serve **as your game board**. You can use the same board for multiple games, or create a new board each time to change it up.

Each player then places their game piece at start (the center of the spiral).

To start, the first player rolls a die and moves that number of cards on the game board. They must then **multiply the number on their die with the value of the card they landed on**. If they solve it correctly, they stay there, otherwise they go back to their previous position.

Players then take turns rolling and moving around the game board.

If a player lands on a card with another player on it, they **"bump" that player back to start**.

If a player **lands on a "double,"** meaning the number on their die and the value of their card is the same, **they get to go again**.

The first player to land exactly on the last card and correctly solve the multiplication problem wins!

Variations to the Game:

Because this creates such a unique game board that is different every time, there are countless possibilities. You can change the rules to practice all sorts of math concepts, depending on the age and ability of your kids.

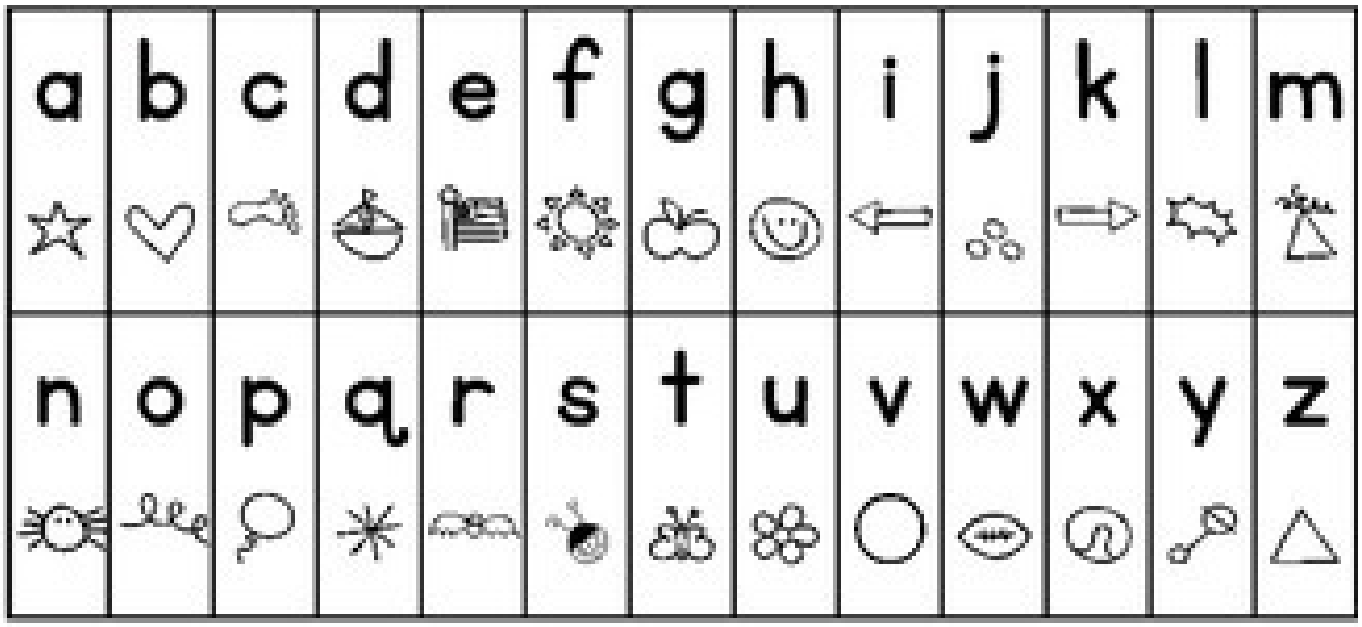
For younger kids, you could **change the operation to addition or subtraction** (or even just practice **number recognition** by removing all face cards).

Or, if you'd like to focus on **multiplying by 10**, change the value of all face cards to equal ten.

To practice **integer operations**, make the black cards positive values and the red cards negative values, then add, subtract or multiply.

Secret Codes

Here are some different codes you can use to create sentences for others to decode. Have fun with it! You can even make up your own type of code. Make sure you give the code to the person solving your sentences.



Example: 1. they = 2. did =

A=5	J=14	S=19
B=4	K=13	T=26
C=3	L=18	U=25
D=2	M=8	V=24
E=1	N=7	W=23
F=6	O=12	X=22
G=17	P=11	Y=21
H=16	Q=10	Z=20

CIPHER ALPHABET

A	=	B	H	=	A	O	=	O	V	=	L
B	=	V	I	=	D	P	=	Y	W	=	P
C	=	G	J	=	Z	Q	=	F	X	=	U
D	=	Q	K	=	C	R	=	J	Y	=	I
E	=	K	L	=	W	S	=	X	Z	=	R
F	=	M	M	=	S	T	=	H			
G	=	N	N	=	E	U	=	T			

A	B	C	D	E	F	G	H	I	J
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https://www.steampoweredfamily.com/activities/bottle-rockets/

Homemade Bottle Rockets Backyard Science

What is it about making big epic reactions that makes all kids REALLY love science? We have done bottle rockets so many times during the years. In fact this is one of the very first activities we shared at STEAM Powered Family. I have now updated it with better pictures and video. But even though my kids are teens now, they still LOVE setting off rockets in the backyard!

STEP 1 – Build a Launch Pad

There are a few ways you can build a launch pad. The key engineering components the kids need to address, no matter what materials they use, is that it needs to be stable and just the right size to hold our rocket (an upside-down 2 litre pop bottle) without it slipping through.

We have built rocket launch pads using tinker toys, craft sticks and LEGO. I have to admit using LEGO was a BIG hit. Now the boys are bigger they are using more ingredients to get bigger reactions and, as you can see in this photo, they loved not only launching their rockets but blowing their launch pads to smithereens!

Building the launchpad works on both math skills (measurements and fitting a round thing in a square hole), and engineering (stability and strength in the construction are key).

Creating A Rocket

To do this you will need the following supplies:

An empty, rinsed pop bottle (I believe my American friends call it soda!)
Baking Soda (aka sodium bicarbonate)
Vinegar
Paper towel
A cork (or substitute something like a pool noodle piece, a cork will give more power to your launch!)
Your newly constructed launchpad
A nice big open space

Preparing for Launch

You will want to do this in a fairly open area. Our rockets hit anywhere from 30 to 50 feet in height (as a rough estimate based on the height of our house), and the wind can pick it up and cause it to fly pretty far sideways too.

Take a clean bottle. Feel free to decorate it and make it really look like a rocket.

Set your launchpad in a nice big open area, on nice solid ground.

Fuel Up The Rocket

Place approximately 1 – 2 cups of vinegar in the bottle.

Take a piece of paper towel and cut it to about 4 inches square.

Place about a tablespoon (we used a HEAPING tablespoon… my teens love a BIG blast off!) of baking soda in the centre of the paper towel. Fold up the paper

towel so the baking soda is wrapped up inside and it fits snugly inside the mouth of the bottle.

Insert a wine cork into the mouth of the pop bottle, make sure it is in there tightly.

3… 2… 1… BLAST OFF!

You need to move quickly for this next part. Flip the bottle over, place it in the launchpad and move back quickly!

The Science of Bottle Rockets

This is an incredible STEM activity but can easily be turned into a STEAM activity.

With this Bottle Rocket project we learned about:

- Engineering, measurements (math) and some physics to create a base that is functional, strong and stable.
- Chemical reactions with our all time favourite reaction: baking soda and vinegar. We learned about how this particular chemical reaction has one important product: Carbon Dioxide Gas.
- Then we learned about physics and how when you trap that gas from the chemical reaction pressure builds up and when finally released it has enough force to cause thrust, therefore launching our rocket “into the clouds!”

Safety Note:

My teens are old enough to do this project by themselves, but it is important that there is always adult supervision.

With younger kids I highly recommend they watch and cheer for this project from a safe distance while an adult loads and launches the rockets.

We were often sprayed with vinegar, so ensure all appropriate safety gear and clothing is worn to protect you from any spray.

Don’t ever get too close to an armed bottle rocket. Arm it, place it immediately into the launchpad and move away quickly!

Most of all, have fun learning about science in your backyard this summer!

Super Cool Lava Lamp Experiment for Kids

https://funlearningforkids.com/super-cool-lava-lamp-experiment/

This lava lamp experiment is super cool! Your kids will love exploring colored water and oil, but a surprise ingredient will make this science activity even more exciting! It's always a hit with the kids. So grab a few household supplies and give this lava lamp science activity a try!

As part of our science lessons this school year, we are trying out all kinds of really neat science experiments and activities. This lava lamp experiment tops the list!

Both of my kids had a blast with this. We've actually done it several times and with all different colors, but it never ceases to amaze them. It's almost shocking how long they will engage with it.

One great thing about this science experiment is that you only need a few supplies and your probably already have most of them in your home or classroom.

*****Disclaimer**: Adult supervision is required for this experiment. You must supervise your children at all times while doing it.*

Lava Lamp Experiment

Supplies Needed:

Affiliate links below.

- Vegetable Oil
- Water
- Food coloring – primary colors or neon
- Original Alka Seltzer tablets

To begin, color about 1/2 cup of water with food coloring. I like using these gel food colors for vibrant coloring.

Take the Alka Seltzer tablets and break them into 2 or 3 pieces. Place them in a small cup or container.

Fill a glass about 3/4 full with vegetable oil. Then pour in the colored water until the liquid in the cup is about 1-2 inches from the top.

You don't want it to overflow! Well, unless you want to turn it into an eruption experiment too. For this reason and quick cleanup, I like to do this on a tray.

Let the children take turns adding a piece of an Alka Seltzer table to the cup. *DO NOT let them put the tablet in their mouth at any time.

Why this Science Experiment Works

The water and oil do not mix and the oil doesn’t change color because the food coloring is water soluble. The Alka Seltzer reacts with the water to make bubbles of carbon dioxide. The bubbles attach themselves to the blobs of colored water and bring them to the top of the glass. When the bubbles pop the blobs of colored water fall back to the bottom of the glass.

https://frugalfun4boys.com/build-tissue-box-catapult/

Tissue Box Catapult!

Turn an empty tissue box into a fun catapult! This engineering challenge is a great rainy day project for kids, and great for STEM learning too.

This fun little catapult can be built in just a few minutes, and it shoots 8-10 feet! Far enough to be cool, but not enough power to hurt someone. We found this idea in Family Fun magazine several years ago and decided to build another one with the younger kids. The basic catapult design doesn't shoot super well – look for an important tip in the instructions.

Here’s what you need to build one:

- An empty tissue box
- 3 pencils – unsharpened is best
- Rubber bands
- Hole punch
- A plastic cap
- 1 pipe cleaner
- Scissors
- Hot glue gun

Step 1: Start by cutting the opening of your tissue box a little larger, like this.

Step 2: Use a rubber band to attach two pencils so that they make a cross. Then use a hole punch to make holes on either side of the box. Insert the pencils. You may need to use a sharpened pencil or a pen to make the holes a little larger.

Step 3: Attach a rubber band to the end of the pencil. We used a knot like you would do on a luggage tag. We also attached two rubber bands since ours were short.

Step 4: Make a little hole on the end of the box and pull the rubber band through.

Step 5: Stick the pipe cleaner through the loop of rubber band and then tape it to secure it to the box. Otherwise, the tension on the rubber band will pull it back through! Now the catapult has rubber band power!

Step 6: Use hot glue to attach a plastic cap to the pencil.
This is what the catapult looks like when it's just sitting there.

To shoot it, you need to pull the arm down like this:

Now if you stop here, the catapult will shoot, but since the shooting arm is pointed down toward the ground when it releases the projectile it doesn't go very far! We added another pencil to stop the shooting arm at a better angle.

We experimented a little bit with the third pencil. Taping it directly to the box didn't work because of the tension of the shooting arm. The best bet was to attach it to the other pencil with duct tape.