I hope the handouts are complete enough. The first ones on measuring, magnets, scissors, chemistry and cotton balls were handouts for parents as whole sheets. On the others, the top part is the back side of the parent handout with vocabulary words, science info, and activities. The opposite side had the program name and cute picture. Below I listed the supplies, activities and **bold face** sign suggestions as someone requested.

What does STEM look like for babies and preschoolers? It looks like fun.

Let me know if I left out something you wanted or have other questions. Theresa tgemmer@everettwa.gov

**Some web resources for STEM activities:**

Pinterest: Look for science babies or toddlers or preschoolers, lots of great ideas

<http://www.education.com/activity/preschool/science/>

<http://www.pbs.org/parents/education/science/activities/preschooler-kindergarten/>

<http://chemistry.about.com/od/chemistryactivities/tp/Preschool-Science-Experiments.htm>

**Other:**

Retro baby: cut back on all the gear and boost your baby's development with more than 100 time-tested activities by Zachary, Anne H; Month by month developmental activities focusing on using household items, and inexpensive or homemade gear

[www.**washingtonstem**.org](http://www.washingtonstem.org) Website for Washington STEM which is funded by Boeing, Microsoft, and Fluke among other corporate sponsors along with non-profits. This is a good resource for data about why STEM is important especially to Washington State if you are pursuing funding for STEM projects.

**Supplies:**

Amazon

Discount School Supply

Lakeshore Learning

Dollar store

Grocery store

Recycling bin at home

Hardware store

If you have some $, these are some of the first things I would buy:

Painters’ tape

Blocks for babies and for toddlers and up

The ball pit (inflatable children’s pool and set of ball pit balls)

Magnetic fish and pole with reel

Ramp and roll toy

Bucket of cars and vehicles

**Color Rice**:

1 cup white rice

1 Tablespoon vinegar

Food coloring (start with a good squirt)

Put rice in zip-lock bag. Add vinegar and several drops of food coloring. Shake to mix, adding more coloring if needed to reach desired tint. Spread on wax paper to dry.

**Teaching Preschoolers to Use Scissors**



**Around the age of four**, children begin to develop their fine motor skills. Learning to use scissors and other handheld tools helps children refine these motor skills. It's important to introduce preschoolers to scissors early on because learning to use scissors can actually strengthen a child's coordination and help him to learn how to write. By teaching your preschooler to use scissors, you can help develop his mind and his creativity.

**Providing the Right Scissors**

As preschoolers learn to use scissors, their fingers may get in the way as they cut, so it's important to use children's safety scissors. These scissors only cut paper, so they're safe for little ones to use. As an added benefit, safety scissors are smaller than regular scissors, so they fit in a child's small hands more easily. Before giving the scissors to the child, observe him to determine whether he is right- or left-handed; then give him either right- or left-handed scissors accordingly. If he uses the scissors with his nondominant hand, there's no cause for concern. Many children are ambidextrous.

**Holding and Maneuvering the Scissors**

Place the scissors on the table and have the child pick them up by himself. Have a pair of scissors in your own hands and show the child by example how to hold and maneuver the scissors. Encourage him when he opens and closes them correctly, and gently correct him by your own example when he has trouble. Allow him to cut a few pieces of paper, and cut your own piece of paper alongside him until he gets the hang of it.

**Direction and Follow-Through**

Give the preschooler a specific project that involves cutting paper with scissors. You may ask him to make a paper mask or cut out a snowflake shape or even ask him what he wants to make. Give the child a project that will involve cutting out different shapes so he gets practice in maneuvering the scissors. Don't be too strict in your instructions. Let the child explore his own creativity to make something unique.

**Additional Materials**

Provide the child with extra materials so he can have fun and be creative. Give him a glue stick so he can cut and paste, or give him crayons so he can color his creations. By allowing the preschooler's creativity to flourish, you allow him to learn to use scissors in a fun and exciting way. Observe the child and mark his progress so you can make sure that his motor skills are developing appropriately. *By Courtney Clark*

**Stress Scissor Safety**

**Scissors are only for cutting paper. Nothing else!** (This includes shirts, crayons, fingers, hair, and lips.) If a child feels the need to cut something other than paper, he loses the privilege of having scissors until he is ready for another chance. If the problem happens again, the scissors are taken away.

**Avoid walking with scissors.** Discourage children from walking around the classroom while holding scissors. On the rare occasion that they must do so, the students know the proper way to hold them is with the blades closed, gripping the blade end in the hand, forming a fist around the blades, and leaving the handles exposed. The scissors should be held close to one's side when walking. By following this rule, there is no risk of children walking around while opening and closing the blades.

**Work on Fine Motor Skills First**

Before teaching your child to use scissors, have him participate in some fun activities that will strengthen his hand and finger muscles and improve bilateral coordination.

Tong activities are an entertaining option. Have your child use kitchen tongs to stack small blocks or to move cotton balls from one container to another.

Tear paper into small pieces to improve the ability to use both hands in a coordinated manner.

Spin a top to exercise the muscles in the thumb, index, and middle finger.

Punch holes on index cards with a handheld puncher to strengthen the hand muscles and improve bilateral skills.

Squeeze water out of squirt-toys in the bathtub so hand muscles get a workout.

Use an eye dropper filled with watercolor paints to challenge fine motor skill.

Place clothespins or kitchen clips on the edge of a paper plate to strengthen small hand and finger muscles and encourage bilateral skills.

[](http://www.google.com/imgres?q=scissors+child+pictures&sa=X&rls=com.microsoft:en-us&biw=1024&bih=659&tbm=isch&tbnid=E2ayqqgONy8_7M:&imgrefurl=http://depositphotos.com/3932677/stock-photo-Child-with-scissors-cut-paper-in-play-room..html&docid=j2zg_RWomG_jVM&imgurl=http://static5.depositphotos.com/1000260/393/i/950/depositphotos_3932677-Child-with-scissors-cut-paper-in-play-room..jpg&w=1024&h=805&ei=hB3SUabDIOqmyQHFjoHACw&zoom=1&iact=hc&vpx=2&vpy=326&dur=1513&hovh=199&hovw=253&tx=105&ty=133&page=3&tbnh=141&tbnw=162&start=47&ndsp=22&ved=1t:429,r:63,s:0,i:276)

****

Learning Fun With Cottonballs

***Literacy:***

* Place a cotton ball, Ping-Pong ball and basketball on a table for your child to handle. Discuss with the children how the balls are similar to one another. Discuss how the balls are different from each other.
* Give your child a cotton ball to hold. Ask her to suggest words to describe a cotton ball, for example, “soft” or “light”. Ask him to suggest words that do not describe a cotton ball, for example, “scratchy” or “heavy”.
* Print a letter or letters on a piece of construction paper. Put double-stick tape (or glue), along the letter shape and invite your child to stick cotton balls on the shape.

***Mathematics:***

* Place a large number of cotton balls in a shoebox and replace the lid. Make a hole in one end of the box large enough for a child’s hand to fit through. Challenge your child to reach inside and pull out as many cotton balls as they can with one hand. Count the balls with your child.
* Show your child an empty cup. Ask him to guess how many cotton balls it will take to fill the cup. Count the balls one by one as you put them in the cup.
* Ask your child to put three cotton balls on one side of a balance scale and the same number of stones, marbles, cereal bits, etc. on the other side. Encourage them to guess which will be heavier.
* Challenge your child to see how far they can throw a cotton ball. Invite them to measure the distance they threw the cotton ball.
* Place an assortment of different colors or sizes of cotton balls on a table. Invite them to sort the cotton balls by size or color.
* Provide measuring cups of different sizes. Put cotton balls in an open top container and let children scoop up the cotton balls with the measuring cups.

***Science:***

* Invite your child to use a magnifying glass to closely inspect cotton balls.
* Out of sight of your child, dip cotton balls in various familiar scents such as vanilla, liquid soap, or chocolate syrup. Put the cotton balls in separate cups and challenge your child to use her sense of smell to identify the scents.
* Gather together several small items such as rocks, crayons, small toys and cotton balls. Place the items on a table and challenge the children to blow on the items and see which ones can be moved using only air.

C is also for Chemistry

What is **chemistry**? Chemistry is the study of matter and the changes that take place with that matter. In chemistry, a reaction happens when two or more molecules interact and the [molecules](http://www.chem4kids.com/files/atom_compounds.html) change. Cooking is one of the simplest examples of everyday chemistry. We mix ingredients together to come out with something different once they are cooked. Experimenting with ***Slime*** (see recipe below) or other kitchen ingredients can be fun, but be sure to stay away from mixing cleaning products or other inedibles. For example, bleach and ammonia mixed together may form a toxic gas.

**Supplies:**

Shallow bowl for pennies

White vinegar

Flour

Salt

Water

Measuring cups

Balloon

Baking soda

Clear plastic bottles and/or cups

Raisins

Cooking oil

Liquid soap

Clear soda



**Inflating Balloon:** Combining an acid (vinegar) with baking soda (sodium bicarbonate) will cause a dramatic chemical reaction sure to wow the kids. When the two chemicals are combined, carbon dioxide gas is produced and a fizzy mess is made. Take an empty clear plastic bottle and pour about ½ cup of white vinegar. Using a funnel, pour about ¼ cup of baking soda into a balloon, either ahead of time to enhance the magic, or with your audience there. Place the balloon over the top of the bottle, fasten or hold it in place, then shake the baking soda into the vinegar. The balloon will become inflated with the bicarbonate gas that is created from the chemical reaction. Play with the soda vinegar ratio depending on the size of your bottle and balloon.

**Clean Pennies:** Introduce preschoolers to the concept of chemical reactions by cleaning pennies. Show children dirty pennies and ask them how you might get pennies to go from dull to shiny. Combine one teaspoon of salt and 1/4 cup of white vinegar in a shallow non-metal bowl. Reserve a few of the dirty pennies and add the rest of them to the solution in the bowl. Encourage the preschoolers to observe the pennies as they become clean. Rinse them in clean water and then ask the children to compare them to the dirty pennies.

**Slime:** Make squishy non-toxic goo that hardens in your hands when you squeeze it, but flows like a liquid when you pour it.

Empty a 16 ounce box of cornstarch into a bowl. Add 1-1/2 cups of water. Optional: add about 15 drops of food coloring. Mix the goo with your hands. Have fun!

**Dancing Raisins:** Fill a drinking glass with clear soda and add a small handful of raisins to the glass. The raisins are more dense than the liquid soda, so they start to sink, but the carbon dioxide bubbles in the soda attach to the raisins wrinkles, causing them to float back up. The combined effect causes the raisins to bob up and down, or dance, in the soda. The raisins will continue dancing for about one hour, until the soda loses its carbonation.

**Why we use soap:** Put some water into a bottle and pour in a little oil – the oil will float on the surface. Shake it up – the oil will mix into the water temporarily, but then separate. Add in a bit of washing up liquid and shake it up again – the oil will disperse through the water and not separate out. Try it again with laundry liquid or powder, dishwasher liquid or powder, or soap. Which is better at emulsifying the oil?

Something that makes oil and water mix is called an emulsifier. Our skin produce oils which dirt and other things such as bacteria can get trapped in. Soap enables that oil to mix with the water and be washed away Optional: Use food color in the water.

**Activity**: Make and play with play dough. We did this with preschoolers with little mess and good success. Did not use food color.

Here is one simple recipe: 1cup flour, 1/2 cup salt, 1/2 cup water (optional food coloring) Put all ingredients in a zip-lock bag. Seal bag and knead to mix ingredients.

Set up: Flour and salt in separate large containers. Water in a pitcher or in a bucket to dip. Put the recipe and instructions on the table with the appropriate measuring tools. Ideally, you have a tabletop or pieces of cardboard for the children to play with their dough after they make it. Some may need to add more flour or water depending on how well they measured (the temperature and humidity in the room may affect the consistency as well).

**MEASURING FUN**Preschool is a great time to begin learning simple measurements.  To begin you may want to start with such things as classifying things as either Big or Little, Long or Short.  Eventually, you want to actually show your children how to use measurement tools to determine the length or height of an object.  Eventually, your children can begin to learn how we measure weight, time, and volume.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | **BIG/LITTLE  LONG/SHORT** | | | http://www.preschoolexpress.com/images/med_blue_bullet.gif | Set out a pile of objects. | | http://www.preschoolexpress.com/images/med_blue_bullet.gif | Have your children divide the objects in to two piles. | | http://www.preschoolexpress.com/images/med_blue_bullet.gif | Big and Little or Long and Short. |      |  |  | | --- | --- | | **SIZE LINE UP** | | | http://www.preschoolexpress.com/images/green_bullet.gif | Take two or three straws and cut them into 4- 5 pieces of various sizes. | | http://www.preschoolexpress.com/images/green_bullet.gif | Set out the straws on a table and have your children take turns placing the straws in order. | | http://www.preschoolexpress.com/images/green_bullet.gif | Have the child find the largest piece of straw and place it at the bottom. | | http://www.preschoolexpress.com/images/green_bullet.gif | Then have them find the next largest and place it on top of the largest piece. | | http://www.preschoolexpress.com/images/green_bullet.gif | Continue until the straws are stacked up in order of size. | | Extension:  A fun extension of this activity is to have the child put the straws back into The original straw lengths. | | | | |  |  | | --- | --- | | **WEIGHT MEASUREMENTS** | | | http://www.preschoolexpress.com/images/burgandy_bullet.gif | Set out a non-digital bathroom scale. | | http://www.preschoolexpress.com/images/burgandy_bullet.gif | Let your children take turns stepping on the scale and determining their weight. | | http://www.preschoolexpress.com/images/burgandy_bullet.gif | Children may want to try weighing with their shoes on and then with them off. | | | **FOOD SCALES**   |  |  | | --- | --- | | http://www.preschoolexpress.com/images/purple_bullet.gif | Try to obtain a food scale for your children to use. | | http://www.preschoolexpress.com/images/purple_bullet.gif | Set out some small potatoes. | | http://www.preschoolexpress.com/images/purple_bullet.gif | Let children take turns weighing out different amounts of potatoes. | | | **MEASURING HEADS** It is best to do this activity with two or three children at a time, rather than a larger group.   |  |  | | --- | --- | | http://www.preschoolexpress.com/images/orange_bullet.gif | Wrap yarn around each child’s head and cut it to size. | | http://www.preschoolexpress.com/images/orange_bullet.gif | Lay out the yarn pieces to see which child has the biggest head. | | | **OBJECT HUNT**   |  |  | | --- | --- | | http://www.preschoolexpress.com/images/blue_bullet.gif | Using a ball of yarn, measure the length of several small to medium sized objects in your room. | | http://www.preschoolexpress.com/images/blue_bullet.gif | Cut the yarn each time and put the yarn piece in a box. | | http://www.preschoolexpress.com/images/blue_bullet.gif | Set out the box and let your children each take out a yarn piece. | | http://www.preschoolexpress.com/images/blue_bullet.gif | Children then go on a hunt to find the object in the room that fits their piece of yarn. | | | **MEASURING FISH**   |  |  | | --- | --- | | http://www.preschoolexpress.com/images/purple_bullet.gif | Cut out several paper fish of various sizes. | | http://www.preschoolexpress.com/images/purple_bullet.gif | Set out some rulers and have your children measure the fish to determine which fish is the largest.  (Children will probably be able to see which fish is the largest, but confirm their guess with the actual measurement.) | | | **RULER FUN**   |  |  | | --- | --- | | http://www.preschoolexpress.com/images/gold_bullet.gif | Give each of your children a ruler. | | http://www.preschoolexpress.com/images/gold_bullet.gif | Let them go around the room measuring objects. | | http://www.preschoolexpress.com/images/gold_bullet.gif | Have them hunt for objects that are exactly one foot long. | | http://www.preschoolexpress.com/images/gold_bullet.gif | Be sure to have some one foot objects setting out. | | | **GROWTH CHART**   |  |  | | --- | --- | | http://www.preschoolexpress.com/images/dk_green_bullet.gif | Every couple of months, hang a growth chart on your wall. | | http://www.preschoolexpress.com/images/dk_green_bullet.gif | Measure each of your children against the chart and write their name on their height line. | | | **ANIMAL SIZES**   |  |  | | --- | --- | | http://www.preschoolexpress.com/images/magenta_bullet.gif | A fun activity for your children when you are talking about large animals is to actually show them how long or tall an animal really is. | | http://www.preschoolexpress.com/images/magenta_bullet.gif | First find out an average length or height of the animal, then cut out a piece of yarn that length. | | http://www.preschoolexpress.com/images/magenta_bullet.gif | Let your children go outside and unwind the yarn to see how big the animal really is. | | http://www.preschoolexpress.com/images/magenta_bullet.gif | Children love this activity, but be sure to supervise the use of long yarn sections at all times. | | | **MEASURING TEMPERATURE** Talk about hot and cold with your children.  Discuss examples of when they are hot and when they are cold.   |  |  | | --- | --- | | http://www.preschoolexpress.com/images/red_bullet.gif | Set a temperature gage outside and have a child help you read it every day. | | http://www.preschoolexpress.com/images/red_bullet.gif | Then come inside and mark the reading on a simple temperature gage drawn on a piece of paper. | | http://www.preschoolexpress.com/images/red_bullet.gif | At the top of the paper chart draw a picture of a sun (representing hot) and at the bottom draw a picture of a snowflake (representing cold). | | http://www.preschoolexpress.com/images/red_bullet.gif | Children can watch the chart indicator go up and down, from medium to hotter or colder. | | |  | |

**Use the language of measurement.**

* Introduce your child to words such as weight, balance, size, full yards, area.
* Ask her to compare: “Which board is widest?” “Whose boots are heavier? Yours or Dad’s?”
* Help her ask questions about measurement: “You could ask Grandpa what he measures at work.” “Let's find out if your lunchbox holds more stuff than mine.”

**Show your child how to use measurement in family routines.**

* Your child give pets a set amount of food or water each day.
* He can use teaspoons and measuring cups when you cook together.
* He can learn to check a rain gauge or thermometer and tell you the results.
* She can help fill trash bags and recycle bins. You might help her weigh the trash or recycling each week and use a calendar to keep track of how much your family throws out or recycles.
* He can have a daily schedule for giving garden plants a set amount of water.

**Play games together that use measuring skills.**

* Tag, beanbag toss, and hopscotch are active games that involve awareness of distances. “Pathway” games (for example, Candyland) also involve distances.
* Using a timer during games lets your child practice measuring time.

**Offer other activities related to measurement.**

* Let your child play with nesting toys, interlocking blocks, geoboards, nesting toys, clay, wood scraps, interlocking blocks, stacking toys, and fabric squares.

*Important safety note:*

*Magnet ingestions pose a serious threat to the health of children and adolescents. Parents should be encouraged to closely monitor loose magnets and other magnetic products and contact a pediatrician immediately if they suspect a magnet has been swallowed or inhaled.*

|  |  |
| --- | --- |
| **TRICKY PAPER CLIP:** | |
|  | Put a large glass filled with water on a low table. |
|  | Have one of your children drop a paper clip into the glass. |
|  | Ask your children to think of ways to get the paper clip out of the glass without putting anything in the water or dumping the water out. |
|  | Then show them a strong magnet. |
|  | Hold the magnet against the side of the glass until the paper clip attaches to it through the water and the glass. |
|  | Then slowly pull the magnet up the side of the glass. |
|  | The paper clip will come out of the water without the water being touched. |
|  | Let your children take turns putting a paper clip in and getting it out.  **C:\Users\tgemmer\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\MK1NQKKO\MC900436919[1].png** |

**MAGNET SORT:**   
Collect items that can be picked up with a magnet, such as a metal paper clip, a frozen juice can lid, a washer, and a screw, and items that cannot be picked up by a magnet, such as a rubber ball, a cotton ball, a small plastic toy, and a piece of paper. Let your child use a magnet to sort the items into two piles, picked up by a magnet and not picked up by a magnet. What did the items the magnet picked up have in common? (They were all metal.)

|  |
| --- |
| **Dancing Paper Clips:**  Fill a jar with water and drop two or three paper clips into the water. |
| Tell your children that you can make the paper clips dance up and down in the water without touching them. |
| Then move a magnet up and down outside the jar to make the clips move. |
| Let each of your children have a turn making the clips dance. |
| *Explain that the magnetic force from the magnet passes through the glass and water to make the clips move.*  ***C:\Users\tgemmer\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\A88Q36ZL\MP910216311[1].png Compass Fun:*** *Explain to your children that a compass has a magnet in it to make it work.  The north pole has a magnetic field, and the magnet in the compass is attracted to that field.  So no matter where a compass is held, the needle in the compass will point to the north.*   |  |  | | --- | --- | |  | *Set out several compasses and let your children experiment with them.  Make sure that your children hold the compasses somewhat apart or the magnetic fields will be disturbed.)* | |  | *Encourage your children to make the needles move around.* | |  | *Then give them small magnets to hold next to the compasses.  What happens to the needles?  (The magnetic fields from the magnets are closer and stronger than the one from the north pole, so the needles on the compasses will point to the magnets instead of the pole.)* | | ***Making a Compass:***  *Set out a straight pin, a strong magnet, a piece of cork, and a bowl of water.* | | | *Magnetize the pin by rubbing it in the same direction across the magnet at least 25 times.* | | | *Push the pin through the cork.* | | | *Have your children watch as you place the cork in the bowl of water.* | | | *The pin will point north.* | | | *Let your children check this with a compass.* | | | *Twist the bowl around; the pin will still point north.* | |   ***Discovery bottle with pipe cleaners:***  *Cut pipe cleaners into small pieces and put in empty plastic bottle. The wire in a pipe cleaner is magnetic although you will want to keep the weight of the pipe cleaner very light so the magnetic wand can easily pick it up and move it in the bottle.* |

**Size and measurement**

**Size and measurement words:**

Amount Length Small

Balance Long Tall

Big Magnify Tape Measure

Depth Pound Timer

Height Ruler Volume

Inch Scale Weight

Large Short Width

**Measurement** is a key part of STEM. Whether we need to record results in a science experiment, build something, or send a rocket to the moon, measurement will be involved.

**At home:** Cooking is an excellent way to practice measuring with your child. Talk about what you are adding to a recipe and show which tools you use to measure it - by volume or by weight. (P. S. Cooking is chemistry!)

**Big/little long/short game:** Set out a pile of objects. Have your child sort them into groups by big or little or by long or short.

 Storytime science:

Use a scale (balance scale if you have one) ask which is bigger? which thing is heavier? Use a large cotton ball and a small heavy object, children will generally guess that the big thing is heavier. Talk about different ways to think about more and less.

**Equipment:**

Large sheet of paper to tape to wall

Painter’s tape

Child-safe marker or crayons

Measuring tapes – Can purchase child’s measuring tapes, or borrow real ones from others

Rulers, yardsticks, sand timers, scales

Bungee cord, bucket and a way to hang it – an over the door coat hanger works if you have a door handy

Measuring cups and spoons(check your local $ stores)

Color rice or cotton balls or? I don’t recommend beans as they can be stuck up noses or in ears)

And other things to weigh and measure – toy animals, whatever

Three bowls, boxes or baskets

Ring stackers or lids

Duplos or cubix

**Activities: *I used very few signs with this program, just the highlighted text.***

Set out containers with rice or whatever to measure with measuring equipment

**Measure me!**Tape paper to walls. Ask children to measure themselves and write their name and size on the wall chart.

**Measure me!** Use a pattern or draw a person. How long are your arms? Legs? Feet?

**How many Duplos to make a tower as tall as you?** Use Duplos to measure height or ?

Bungee scale:

Hook bucket to bungee cord and hang from door or ceiling or ?

Paper behind bucket and marker or crayon to mark “weight” of different objects (bean bags work well)

Balance scale

**Shapes:**

**Shape words:**

Angle Line Silhouette

Arc Outline Solid

Bent Pointed Square

Circle Rectangle Straight

Curve Round Symmetrical

Globe Side Triangle

**Shapes:** We chose to start with 3 basic shapes: square, triangle and circle. (By definition, a square is actually a rectangle with all sides the same length, a difference you may want to introduce as you expand on your child’s knowledge of shapes). Shapes are key to geometry; they are also important in recognizing and forming letters and numbers.

**Shape Hunt Game:** Give your child a shape and send her on a search for things in the house that are that shape. Look for shapes and talk about shapes on an outing in your community.

**Shape Fun with Play Dough:** Roll it out and cut out shapes with cookie cutters, or form shapes with hands. *Peanut Butter Play Dough:* 1 cup powdered milk, 1/3—1/2 cup peanut butter, 1 teaspoon honey. Mix; add more milk if needed.

**Equipment:**

Tangrams cut out of paper. Glue and background paper if you wish to do an art project with them.

Puzzles – especially any that are just shapes

Home-made puzzles with foam and popsicle sticks

Painter’s tape

Shape sorter toys

Ring stackers

Blocks

Vehicles or balls (to drive on shapes)

Play dough

Light colored paper or vinyl to cover a table top, or large sheets of construction paper.

Craft sticks (formerly known as popsicle sticks)

**Signs/Activities:**

**Which shape is easiest to drive on?** Use painter’s tape to make large circles squares triangles on the floor for children to drive on.

**Which shapes stack easiest? Which shapes will roll easiest?** **Can you stack a square on a triangle?** Blocks to stack. Puzzles of any and all kinds

Homemade puzzles: Lay 2 craft sticks side by side and draw a circle square, or triangle so that ½ of the shape is on one, and ½ of the shape on the other to match up. Lay three craft sticks (or straws) on a sheet of 81/2 x 11 paper. Trace around the sticks to make a triangle. Use 4 to make a square. Provide sticks for children to lay on the puzzle. Use craft foam and cut out shapes for quick easy puzzle.

Cover a table with paper and trace lots of shapes for a giant shape puzzle. Children may want to fill every spot, so don’t use the same item 2 x unless you have 2 of them. Use construction paper and make small ones. Make a more permanent puzzle by using a plastic or vinyl table cover and permanent markers.

**Make your own puzzle!**  Set out construction paper and markers or crayons and encourage children to make their own puzzles by tracing around objects.

Play dough (with cookie cutters especially if you can find appropriate shapes)

Tangrams: <http://www.makinglearningfun.com/themepages/MathTangrams.htm> is one on many sites on the internet with printable patterns. The Ellison die-cut machines also have a tangram pattern. Children can play with the shapes as puzzles, or create pictures with them as an art project by gluing them to paper. The traditional art challenge is to use all seven pieces of the tan in the picture/shape.

**Colors**

**Color words:**

Blue Multi-colored Primary

Bright Neon Purple

Dark Neutral Rainbow

Green Orange Red

Light Pale Spectrum

Pastel Yellow

White light is made up of all the colors that we can see. When you see a colored object, some of the light is absorbed, and some reflects back. Our eyes see the color that is reflected. Red, blue, and yellow are the primary colors which are mixed to form the others. Together, the rainbow of colors is called the spectrum.

**Color game:**

“I spy with my little eye” For babies, this game can start very simply with you saying “I spy with my little eye, a red ball” and holding up a red ball. As children become more verbal and mobile, you can encourage them to find an object in the room. “I spy with my little eye, something red.” Then ask them to find it. Start with easy things like a large red rug, and make it more challenging as they grow.

**Supplies:**

Toys in red, yellow, blue

**Color Rice**:

1 cup white rice

1 Tablespoon vinegar

Food coloring (start with a good squirt)

Put rice in zip-lock bag. Add vinegar and several drops of food coloring. Shake to mix, adding more coloring if needed to reach desired tint. Spread on wax paper to dry.

Old CD’s

Flashlights

Gel food color, hair or other clear gel, heavy duty, Zip-lock bags, painter’s tape or duct tape

Variety of construction paper with red, yellow, blue crayons

Theater gels or other semi-transparent plastic (report covers work if you can find them anywhere)

Red yellow blue stickers

Red yellow blue ball pit balls

**Questions for signs / Activities:**

**What colors do you see when you mix these?** Color-mixing with gels in bags: Squirt about ¼ cup of gel into bag. Squirt a little food color in so that initially the colors don’t touch. Try combinations of red and yellow, blue and yellow, red and blue, or all three. Tape them securely to white paper or light colored tabletop.

Play with colored vehicles in colored rice BIG MESS ALERT!

**Can you see a rainbow?** Shine flashlight on CD to see rainbows

Put out interesting pictures to look through colored gels (high contrast pictures work best)

Mini-ballpit; use only the red yellow and blue balls

**Do the crayons look different on different paper?** Colored paper and crayons: Try blue crayon on different colors of paper, see how it looks different (crayons ‘disappear’ on their own color)

Stickers can be sorted by color onto paper. Make columns for red, yellow, green.

**Which color is faster?** Set out red, yellow, blue cars to race. Record data with colored stickers on wall chart.

**Have a Ball**

**Words and concepts to describe playing with a toy ball:**

bounce roll catch throw size texture round sphere globe color elasticity energy down gravity up

**Ball** is often one of a baby’s first words**.** Encourage this fascination by playing together and describing different characteristics of different types of toy balls.

**Reaching**: Infants develop a sideways reach before developing a forward reach. During tummy time, try placing a ball in front of, but slightly to the side of baby and encourage them to reach for it.

**Rolling:** Sit on the floor across from the child, with your legs stretched out in a “v” shape. Roll the ball to them and encourage them to roll it back. Repeat.

**What makes a ball bounce?** Gravity pulls it towards the floor, gaining kinetic energy as it falls. When the ball hits the floor, it stops for a split-second and becomes squashed by its own energy. Then, the ball quickly springs back into its original shape, and is propelled back into the air. An object’s ability to return to its original shape is called **elasticity**.

Equipment:

Balls balls balls

Empty plastic bottles

Ball pit: child’s wading pool and balls (200 phthalate-free 6 colors in hamper 43.99 on Amazon)

Parachute (if you have one) and beach balls

Home made balls: instant ball = use 2 of your child’s socks rolled together or cut and stuff

Cardboard

Painter’s tape

Activities:

Hold up 2 balls, one more inflated than another. Ask which will bounce higher. Drop the balls and see. Ask why? Encourage children to try comparing different kinds of balls in their play time.

Do a parachute activity rolling a beach ball around the parachute.

Set up a ramp. Which shape will move most easily down the ramp? Try a square block, triangle block, and a ball.

Drop balls of different sizes to see which bounce best: do they both reach the ground at the same time?

With inflatable balls, inflate to different levels, see which bounce best

Roll balls to knock down bottle “pins” – empty plastic bottles, or try different weights inside (water or beans)

Cardboard ramps to roll balls down – encourage trying steeper, shallower ramps. Why do cars have wheels?

 “Bowling” Balls and empty plastic bottles

Babies: “o-balls” soft balls

Encourage parents to roll ball to baby

Make a ball pit with a child’s wading pool and balls.

**Questions to post with/activity suggestions:**

**When you throw a ball, will it always fall down**?

**How far can you roll a ball?** (Provide measuring devices)

**Drop two different size/types of balls at the same time. Do they hit the ground at the same time?**

**Go bowling!** (Set out some empty or filled differently plastic bottles for pins)

**Play basketball!** Set out boxes to throw to.

**Magnets:**

Magnetism: In physics, **force** is most simply defined as "a push or a pull". Two forces that do not require the objects to touch are electromagnetism and gravity; they can work across great distances.

A **magnet** produces a magnetic field, an invisible force that pulls on other materials, and attracts or repels other magnets. Objects with iron, steel, nickel or cobalt in them are attracted by a magnet. No matter what shape it is, every magnet has two poles; one positive and one negative. The like poles repel each other, while the opposites attract.

**Words to use:** Magnetism Magnetic Field Force Physics Poles Attract Repel Metal Power Pull Push Opposite Invisible

**Play** with the polarity of the magnets. See if you can make one magnet push another away. Reverse the poles so that they attract. Magnet cars are fun for this experiment.

**Talk** about uses for magnets in your home. Do you use them to hold messages on the refrigerator? If you spill a box of paper clips, would a magnet be useful?

***IMPORTANT! Always supervise magnet play with young children. Magnets can cause severe and even fatal consequences if swallowed. If you suspect your child may have swallowed a magnet, seek immediate medical attention!***

**Equipment needed:**

Magnets preferably made for children to use.

Things to pick up with magnets, and things magnets won’t pick up

(Tricky piece: tape a paper clip inside a paper cup – have similar paper cups without paper clip. Why does the magnet pick up that one cup? How could this be useful?)

Any magnet toys you may have:

Clear plastic containers with various objects inside (paper clips and cut up pipe cleaners are especially fun) Glue and/or tape shut.

Magnet strips and tongue depressors (wide craft sticks)

Paper and string and paper clips

**Questions to post/ activities:**

Be sure to post warning about magnets.

**Which things will the magnet lift? Are they all shiny things? Will a magnet lift all shiny things?** Bottles with magnetic/non-magnetic items inside.

**Can you make a chain with the paper clips?** Bottles with paper clips in them.

Make your own magnet wands – may not be a good idea if you have babies in the room

Magnet letters and numbers and steel cookie sheets or magnet boards

**Go fishing! Ask why you can lift the “fish” with the pole but not the balls** Fishing pole and reel with magnetic worm and fish. (Tolo toys on Amazon and other models) Put the magnet fish in a wading pool – I added the blue and green balls from the set to make “water” Or, you could tie a magnet on a pole with string and fish for paper fish with paper clips on them.

**Can you make the bird/bat/superhero fly?** Cut out a bird from heavy paper. Tape a paper clip and string to the underside and tape the other end of the string to the table. Provide magnets to lift the bird and make it “fly”

I do not recommend doing a magnet program including babies and toddlers just for safety reasons.

**What is a machine?**

 A machine is a tool used to make work easier.

 A simple machine does one of the following:

Increases the speed of something

Reduces the effort needed to do something

Changes the direction of the force that you use

 There are **six** kinds of simple machines:

**Inclined plane Wedge Pulley**

**Wheel and axle Lever Screw**

Talk about simple machines you see in your community; a teeter totter is a lever, and a slide is an inclined plane.

See how many simple machines you can find in your home; a jar lid uses a screw, a rolling pin is a wheel and axle, scissors are levers, and so are hammers and shovels. Talk about, or show, how they make work easier.

Suggested words for talking about machines during playtime, in addition to naming them:

Force Load Work Gear Effort

Threads (screws) Ramp Hub (of a wheel) Fulcrum

**Supplies:**

Toy nuts and bolts if you have the budget, if you are working with preschoolers or older, real nuts and bolts

Tongs: you can buy inexpensive plastic tongs or check out a thrift stores for plastic salad tongs. These are good for strengthening fingers for holding pencils and scissors. Cotton balls or something to lift with tongs

**Ramp and roll** and gear caterpillar toys for babies are both good investments

Ball pit, balls, toy fishing poles

Cardboard

Painters’ tape

Boxes or chairs or ? to set up ramps on

Child’s scissors and paper strips

Small pulleys and thin rope (hardware store)

Buckets or other container to tie on pulley rope

Toy vehicles

Small blocks, old sturdy dull table knives or strong rulers or sticks, l weight (I used a brick sized boxes filled with beanbags and taped shut)

Playdough (homemade or commercial)

Rolling pins and cookie cutters

**Signs / Activities:**

**Scissors are a combination of two simple machines, levers and a wedge** Set out scissors and paper strips to cut. (Add glue and paper for an art project)

**What happens when you move the fulcrum?** I used an old table knife, a small triangle block and my weight. I labeled the knife as “lever” with a Sharpie and the block as the fulcrum with Sharpie. I also drew and labeled a simple diagram of a lever, fulcrum, weight.

**Build a ramp. Can you make your car go faster by changing the slope?** put out cardboard and tapeand boxes or whatever the ramps are to lean onand vehicles to drive on ramps

**A fishing pole is two machines. The pole mechanism is a lever and the reel is a wheel and axle.** Ball fishing pit with toy rod and reel if you can purchase.

Tie bucket or container to thin rope. String through pulley. I tied my pulley to the crossbar on underside of a table – what can you find to use? A doorknob maybe?

**What kind of machine is a rolling pin? (Wheel and axle) Cookie cutters? (Wedges)** Set out play dough and cutters.

Set out toy or real nuts and bolts to play with

Vehicles to drive

Tongs and things to pick up with tongs (cotton balls or other?) Tongs are levers

Ramp and roll toy and gear puzzles and baby appropriate vehicles for babies

**Building big and Small**

**Blocks** are one of the most versatile and long lasting toys you can buy for your children. In addition to their obvious use to build things, they can be used for counting, sorting, and all kinds of imaginative play. Supplement, or create a set of building blocks using your empty food containers. Cover them in gift wrap for fancier blocks.

**Math with blocks:**

*Ask* your child to duplicate a pattern you’ve laid out with blocks.

*Create* a simple pattern of, for example, big-small-big-small, ask “What comes next?” Recognizing sequences is an important math skill.

*Sort* the blocks by size or shape.

*Count* your blocks as you stack them. How high can you go?

**Build a fort in your house:** Use sofa pillows, blankets, rope, clamps, boxes, to make a temporary structure on a rainy day indoors or take it bigger outdoors. Ask a local store about boxes: our Everett Judd and Black appliance store has a recycling bin out back where you can sometimes find large boxes.

**Words to use:** Structure Gravity Height Width Tall Fall Tower Building Balance Join Stack Sturdy Fort Hideout Tunnel Construction Destruction

**Keep it fun!**

**Supplies:**

Any building blocks you have in your supplies Melissa and Doug make very nice colorful sets. A volunteer who is willing to cut and sand scrap wood in your area?

Plastic cups – large size

Blocks made by taping shut cereal and other food containers – children especially loved any cylinders like Quaker oats

Giant blocks: library book boxes, any other cardboard boxes taped shut. Appliance boxes if you can get some from local stores

Fabric (sheets, old curtains) and clothespins,

Newspaper and painters’ tape

Chairs or tables

**Signs/Activities**

Put out all the blocks and building materials. . Children are learning engineering, balance, strength of materials, and don’t need much direction to let their imaginations go wild.

**How tall can you stack the blocks?**

**What are you building?**

**Make a fort from newspaper and tape:** Make some sample building rods or shapes by rolling up newspaper and taping with painters tape to make poles to build with

Set up two rows of chairs with space in between, throw a sheet over the chair backs and fasten on with clothespins, or use a table for fort base

(Flashlights can be a fun addition to forts if you have some)

For babies: soft blocks, any baby blocks The babies enjoyed knocking down towers even if they weren’t able to stack themselves and also enjoyed watching the “big kids” knock down their towers.

