Infant Curriculum

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Toy Reach and Grab

Ages 2 to 9 months old

Educational Developments

- **Muscle strengthening and Reflex**

  The child will develop strength and coordination in muscles that control neck, shoulders, arms, and upper body. These muscles help them crawl and sit up.

- **Hand-eye Coordination**

  Baby will develop hand-eye coordination as (s)he tries to swat at or grab the colorful object.

- **Language Development:**

  They will be introduced to new colors and relate them to common objects.

Materials:

- Black and White or colorful toys that make sounds (your pole with the bell)

Instructions:

1. Hold the toy just out of reach while the baby is in the various positions listed below. Shake the toy to entice them with sound and color.
    - **Positions:**
        i. **Tummy time:** Hold the toy at eye level and just out of reach to require them to reach out to grab the toy.

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ii. **Back:** While lying on their back, hold the toy above their stomach and slightly out of reach. The baby will strengthen their stomach muscles by reaching their legs and arms up to grab the toy.

iii. **Crawling position:** While in crawling position (on all fours), hold the toy above eye level and out of reach. In this position, we want to help them develop strength and coordination by balancing on two legs and one arm.

iv. **Sitting position:** Hold the toy out of reach at either side (left or right). In this position, we will help them develop their reflexes for catching themselves. Our goal is to help them learn to put their hands out and on the ground to catch their fall. This exercise also strengthens the muscles that will help them roll from back to tummy.

2. Coach them to grab and pull the object. Form their hand around it and show them how to pull.
3. Describe your actions, the colors they touch and relate them to common objects.
    a. Ex. “Baby Max is grabbing and pulling the toy. Baby Max is touching green. G-g-green! Green is the color of the peas that Max love, grass that the doggies play in and the leaves on the trees. It is Fall now so the green leaves are turning orange like carrots!”

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Ice Painting

This activity is intended for children ages 8 - 24 months. It will allow them to explore colors and create different patterns using taste safe ice paints.

Educational Development

- **Sensory Integrations Skills:**

  This activity uses touch and sight to identify colors, temperature and relate them to common objects.

- **Fine Motor Skills:**

  Your little will engage and develop the smaller muscles in their fingers, wrists, and hands as they pick up, hold and maneuver the ice.

- **Language and Communication Skills:**

  You'll encourage children to identify the colors they are using and associate them with common objects around them.

Materials

- Water
- 8-10 drops of red, yellow, green and blue food coloring
- Short popsicle sticks
- Ice cube tray
- White cardstock or thick paper
- Old newspaper

Instructions:

1. Pour water into the ice cube tray evenly.
2. Mix 8-10 drops of red food coloring. Repeat with all colors.

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3. Put a short popsicle stick into each ice cube mold.
4. Freeze the solution for 6 to 24 hours.
5. After freezing, place the ice cube tray on warm water to get the ice paint sticks.
6. Lay old newspaper on the floor to protect from paint stain.
7. Place the ice cube tray on cardstock or thick paper.
8. Help the child choose the color they like. Tell them the name of the color, produce the phonic sound of each letter of the word, and let the child repeat the name of the color.

   Example: “Oh you like the red color! Can you say “red”? Red is the color of an apple, your toy ball, etc. Isn’t this red paint cold?”

9. For older children, you may ask them what color they will have when they combine colors.

   Example: “Thea, what will you get if you combine red and yellow? Orange, fantastic! What orange object can we see around the room?”

10. Let your child explore and have fun using the paint sticks to create watery patterns.

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Bottle Shakers

Ages: 4 to 16 months old

Educational Developments

- **Social learning:**
  Imitation requires a child to understand your actions and direct their body to repeat them. It helps little ones develop social learning and provides a foundation for conversational speaking: person #1 speaks, person #2 listens then responds.
- **Small hand muscles and motor skills:**
  You will help your little one develop their small hand muscles and motor skills by grasping and holding the shaker bottle. Fine motor skills help your little feed themselves, button their shirts and write!
- **Language development:**
  They will be introduced to new colors and relate them to common objects.

Materials:

- 2 or more small shaker bottles filled with colored objects (rice, chickpeas, flour, etc.)

Instructions:

1. Shake the bottle, pause, shake the bottle and pause.

- Taking breaks in-between shaking allows the child an opportunity to connect that the sound arises when you move or shake the bottle.

2. Describe the color(s) inside the bottle, what you are doing and point to all objects for reference.
    - Ex. “Miss Sarah is shaking the bottle. The bottle (point to the bottle) has yellow rice inside. Y-y-yellow. Yellow like the sun, lemons, and bananas. Baby Alex loves bananas! Mmm bananas!”
3. Put another bottle in the child’s hand. Help them form a grasp around it and show them how they are able to shake.
    - If this is very easy for them to do, help them hold and shake two bottles. Infants have great difficulty holding two objects at once as they are still developing their coordination.
4. Take turns shaking the bottle. Continue to describe the colors and actions.

Toddler Curriculum

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ABC and Numbers Color Reveal

This project will review numbers and practice identifying letters in a fun and creative way! This experiment combines well with other language-development projects such as the Sensory Writing Bag.

Materials

- Printer paper
- White crayon
- Ruler
- Watercolors
- Paintbrush
- Spray bottles (optional)
- Food coloring
- Cup with water

Instructions

1. Use your ruler to create 26 boxes on each of two sheets of printer paper. Use one page for uppercase letters and the other for lowercase letters.
2. Write one uppercase letter in each square with a white crayon. Write one lowercase letter in each square on the other sheet.
3. While you are doing this, allow children to draw secret pictures and messages in white crayons that will be revealed later.
    a. For younger children, you may have to display how this works to instill excited understanding.
4. Use watercolors to paint over the sheets and reveal the hidden messages!
5. **Repeat** this activity with numbers and common sight words.

6. If desired, repeat the activity with **spray bottles**. Fill a spray bottle with water and allow the child to add a few drops of food coloring. Spray to reveal the hidden message!

Educational Component

- Review the letters and numbers with your child.
- Say and sound out words that begin with each letter you review. Help the child explore additional words by identifying objects in your household or environment that begin with the letter you're reviewing.
    - For example, "E sounds like "eh." E is the first letter of egg, elephant and elf. Do you see any objects in here that start with the "eh" sound?"
        - Emphasize the letters that the child's first and last names start with.
- Count and describe objects in the home that correspond with the numbers you read.
    - For example, "This is 3. There are 3 large, brown chairs over there. Let's count together! One, two, three..."
- Review the colors used to reveal their secret messages and help them relate the colors to objects in their home or environment.
    - For example, "You used green to reveal the letter D. What other things are green? Trees, limes, lizards, etc."

For younger children, color code the letters!

Name: _____ Date: _____

Color the Letters!

Color the boxes with uppercase A's red, the boxes with the uppercase B's blue, and the boxes with the uppercase C's yellow. Can you spot the hidden picture?

Bonus: Find all of the lowercase letters and color them green.

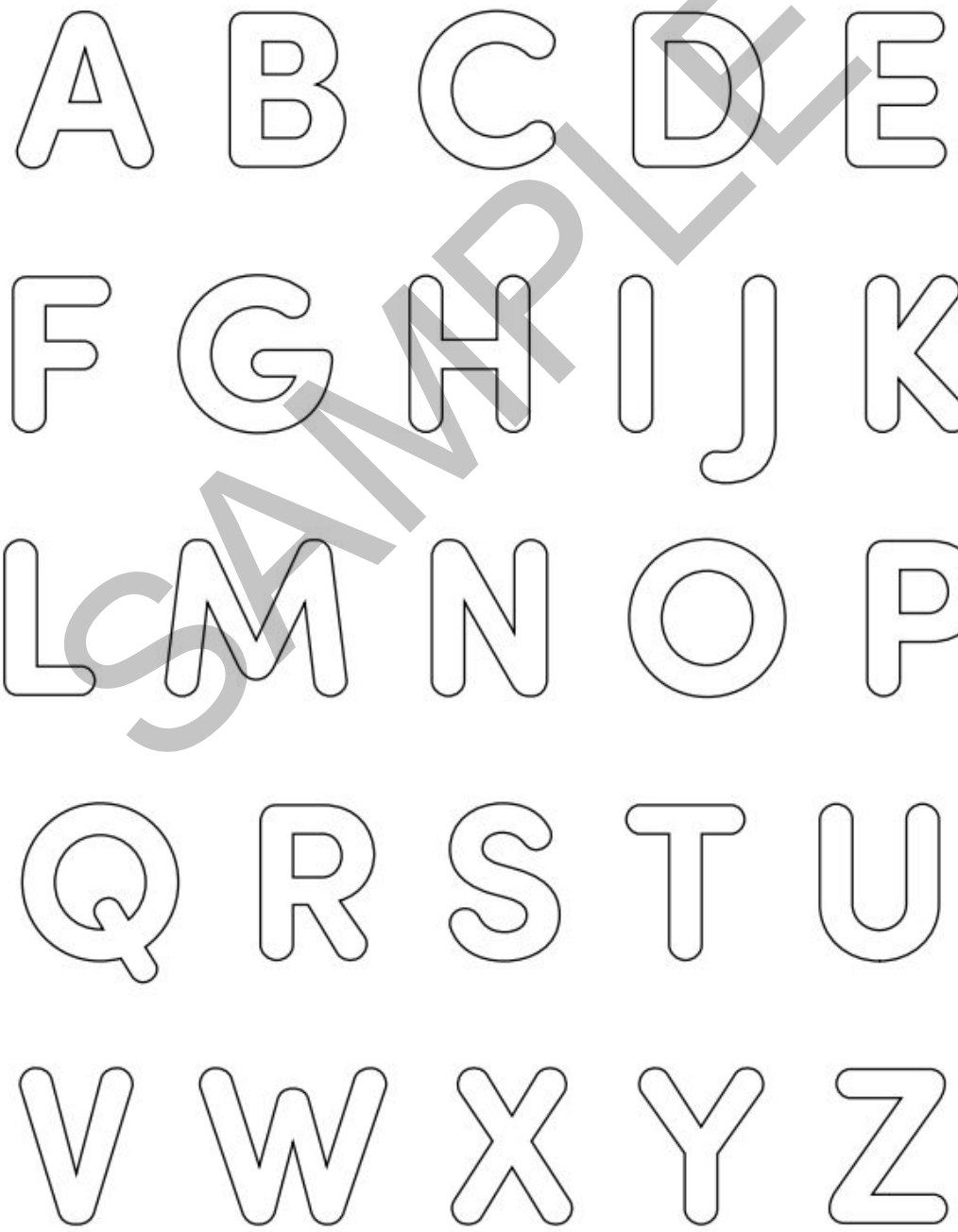
b	a	c	A	b	c	a
a	c	A	B	A	b	c
c	B	b	A	a	C	b
B	C	B	a	C	A	C
b	B	a	c	b	C	a

Practice Writing uppercase letters!

Name ..... Date .....

Uppercase Alphabet in Color

Have fun coloring in each uppercase letter with a different color of your choice.
For extra fun, outline each letter with multiple different colors to create a rainbow effect!



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Icy Color Mixing

In this activity, your little will learn about primary colors, secondary colors and who colors result when you mix them. This project works well with the Frozen Goop activity.

Materials:

- Water
- Food coloring
- Ice cube tray
- Clear cups or bowls

Instructions:

1. Pour water into three separate cups. Add 5 - 7 drops of each primary color food coloring to each cup.
    - Cup #1 with drops of **red**. Cup #2 with drops of **blue**. Cup #3 with drops of **yellow**.
    - Count the drops aloud and together. “One, two, three...”
2. Fill each ice cube tray with the colored water. Keep each primary color separate.
3. Freeze overnight.
4. Create a contrasting display of colors. Add the ice cubes to the cups. Mix the colors to make new ones.
    - Cup #1 = Red ice cubes
    - Cup #2 = Red and Yellow ice cubes
    - Cup #3 = Yellow ice cubes
    - Cup #4 = Yellow and Blue ice cubes
    - Cup #5 = Blue ice cubes
    - Cup #6 = Blue and Red ice cubes
5. Pour warm water on top to watch the ice melt and form new colors.

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Educational Component:

- How does ice feel? Cold!
- Can you feel the water we are pouring into the cup? How does it feel? Warm!
- What happens when we combine something warm and cold? The cold object will increase in temperature and become warmer. In this case, our ice melts.
- What colors do you see? What colors do you think we'll see after we pour our warm water in?
- Have you heard of primary colors are? Primary colors are the **first** or original colors. They are Blue, Yellow and Red. All other colors result from combinations of these colors!
- What happened when we mixed two colors together? They change into a new color!

- What are secondary colors? Secondary colors are what occur when you mix primary colors together. Examples of secondary colors: green, orange, purple.
- What colors mix to make green? Blue and yellow!
- What colors can you mix to make purple? Red and blue!
- What colors can you combine to make orange? Red and yellow!

Art Extension: With the extra ice cubes, you can get your toddler a piece of paper and let them paint away! This is a great sensory activity that allows them to explore temperature while unleashing their creativity.

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Fish Habitats

This is an interactive way for children, ages 2 - 8 years old, to learn about freshwater and saltwater habitats, create their own aquatic habitat and go fishing!

Materials

- Metal tray
- Magnets [with a hole in the middle]
- String
- Foam sheets
- Hot glue gun
- Hot glue sticks
- Hanger [obtain from the child's home]
- Markers
- Scissors
- Salt [optional]

Instructions

1. Review the Educational Component portion with the children.
    a. Which habitat do the fish from Finding Nemo live in?

    Dory = Blue Tang fish [saltwater]
    Nemo = Clownfish [saltwater]

2. **Choose your habitat.** Allow children to decide if they would like to create a fresh or saltwater habitat. If they choose saltwater, mix water with salt **after step 3.**

3. **Create your habitat.** Have the children consider what kinds of things are in a lake or ocean and name different plants and animals in each.
    a. Go outside to cut grass and other plants for the aquatic plants. Use your hot glue gun to glue the plants to the perimeter and bottom of the metal tray.
    b. Fill the tray with water. Mix in salt if the children chose saltwater.

4. Draw fish shapes on the foam sheets. Decorate the fish then cut them out.

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5. Hot glue one fish onto each magnet, let it dry then place the fish in the water.
6. Tie one end of the string to a separate magnet and the other end to a hanger.
7. Use the hanger as a rod and go fishing!

Educational Component:

- Do you know what a habitat is? The home of a plant, animal or organism!
- What do you know about aquatic [water] habitats? Tell them that there are two main types: freshwater and saltwater. What do you think the difference is between them?
    - Saltwater: The water contains salt.
    - Freshwater: Water does not contain salt.
- Ask them to list the names of different aquatic habitats. Write two columns: freshwater and saltwater. Put the different types of aquatic habitats they name in each column

    Freshwater: Lakes, ponds, rivers, creeks and streams.
    Saltwater: Ocean, sea and estuary [where a river and ocean meet].

    Prompt them to consider that different fish and plants live in fresh and saltwater. A plant or fish that lives in a freshwater habitat will not survive in a saltwater habitat. Do you think I can put a freshwater fish such as salmon and put it in the ocean? No!

    Freshwater organisms:

    Fish: Bass, Catfish, Trout
    Organisms: Frogs, toads, crawfish, shrimp, lobster, clams

    Saltwater organisms:

    Fish: Clownfish [**Nemo**], Damselfish, Blue Tang [**looks like Dory from Finding Nemo**]
    Organisms: Sea turtles, seals, sharks, whales, stingrays

Child Curriculum

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Erupting Lemon Volcano

This experiment helps children explore chemical reactions, review citric acid and the release of carbon dioxide. This project pairs well with Fizzy Colors, Exploding Baggies and Balloon Blow-Up.

Materials:

- Lemons, oranges, limes or other citrus fruit
- Baking soda
- Food coloring
- Dish soap
- Plate, tray or bowl
- Craft stick
- Lemon juice
- Paper
- Art materials: pencil, crayons, colored pens

Instructions:

1. Carefully cut the citrus fruit in half and place one half on a plate or bowl. Assist children in using a safety knife.
2. Prepare extra lemon juice by juicing the second half. Pour the juice into a cup and set aside. Be sure to wear your **safety glasses** to avoid the juice splashing in your eyes.

3. Use craft sticks to poke holes in various sections of the lemon.
4. Add 3 drops of food coloring onto the lemon. Encourage the children to count aloud “1.2.3”.
5. Pour some dish soap all over the top of the lemon.

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Note: What does dish soap do? Adding dish soap to a reaction produces additional foam and bubbles.

6. Add a spoonful of baking soda onto the lemon. It should start to frizz.
7. Use the craft stick to press some of the baking soda down into the different sections of the lemon to get the eruption going.
8. To keep the reaction going, alternatively add more baking soda, coloring, dish soap and the reserved lemon juice to the reaction. Have you ever smelled a volcano this good?
9. Clean up the mess. Encourage children to draw or paint the largest volcano in the world.

Educational Components:

- What did you see happening? A reaction occurred! It fizzed and made bubbles!

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- Citrus fruits like limes, lemons, and oranges contain a compound called citric acid. Can you say citric acid? **Citric acid** is a type of acid that reacts when mixed with baking soda.
- How are bubbles usually made? With air from our mouths.
    - In this case, when we mix the citrus fruit (citric acid) and baking soda a reaction occurs and releases Carbon Dioxide gas.
- Have you heard of Carbon Dioxide?
    - Carbon dioxide gas is found in our air. Gases are clear, tiny particles that we can't see. It is also the gas that we exchange with plants! Plants release oxygen which we breathe in and we release carbon dioxide which they "breathe in"!
- How do you know your reaction has finished?
    - The reaction is finished when we stop seeing bubbles. This occurs when our reactants run out.
- Can you guess what our reactants are?
    - The things we put together to make a reaction happen.
- What are our reactants?
    - The citric acid (from our citrus fruit) and vinegar!
- What is a volcano?
    - A volcano is a place on the Earth's surface where the liquid from the center of Earth, called magma, escapes.
- Are there different types of volcanoes? Yes! Cinder Cone is the most common kind of volcano. It usually has a narrow top, steep sides and a wide bottom.
- What is the largest volcano on Earth?

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- Mauna Loa, found in Hawaii, is the world's biggest volcano on Earth. It is the width of about 89 commercial airplanes or 928 cars.

- Do Engineers work with volcanoes? Yes! Engineers design instruments that predict when volcanoes will erupt to make sure people get to a safe place.

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Magic Milk

In this activity, children will learn about colors, color mixing, and chemistry. They will discover how the contents of milk and soap react when mixed together.

Materials:

- Milk (full-fat)
- Food Coloring
- Dish Soap
- Cotton balls
- Feathers
- Q-Tips
- Glitter (for more sparkle!)
- Cookie Cutter (optional)
- Plate or flat dish
- Small bowl

Instructions:

1. Pour milk into a flat baking dish. Use just enough to cover the bottom and then some.
2. Cover the surface of the milk with drops of food coloring.
    - Sprinkle on glitter is desired.
3. Pour a bit of dish soap into a separate small bowl.
4. Insert one end of a q-tip into the dish soap to coat it.
5. Gently touch the swab to the surface of the milk! What happens?
    - Test inserting the dish soap into different areas. Is the effect different if we insert the swab directly into a droplet of food coloring?

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6. Now try it with the cookie cutter. Touch one side of the cookie cutter to the dish soap and put it in the milk. What happens?

Extension: Re-do the experiment with other objects. What happens when we use our finger, a feather or a stick to insert the dish soap?

Educational Component:

- What colors did we see on our milk?
- What happens to the colors when they are mixed together?
- What did you see was happening? The colors are moving!
- What made the colors move? The dish soap on the cotton swab! Milk is made up of minerals, proteins, and fats. When the dish soap enters the milk, **the fats begin to break up**.
- The soap molecules (the smallest unit of something) run around and try to attach to fat molecules in the milk. Normally this process would be invisible to you, but the food coloring helps you to see the movement taking place.
    - This is why we use dish soap to clean. It does a great job of attaching to and removing fats!
- Why do you think it stopped moving after a period of time? If the colors stopped moving, it means, all the fat molecules have been found. To make sure, try dipping fresh cotton bud coated with dish soap. If there is still movement, that means there are still some fats on the loose!

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- What else did you observe?

To extend: Try other kinds of milk! Help children improve on their observation and comparison skills by changing one variable at a time and comparing the results.

Type of Milk	Speed of movement	Time of movement (in seconds)	How wide is the spread of colors?
Whole Milk			
Heavy Cream			
Less Fat Milk			
Non-dairy Milk			
Water			

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Balloon Rocket

This activity will demonstrate the basic principle of rocketry [a branch of science that deals with rockets] and display concepts of pressure and Newton's Second Law of Motion [the relationship between an object's mass and the amount of force needed to move it] and Third Law of Motion [for every action there is an equal and opposite reaction].

Materials:

- 1 Balloon
- 1 large straw
- 10 feet of string
- Cargo: paper clip, bottle caps, candy
- Cereal box, construction paper or any cargo lightweight containers
- Tape
- Scissors

Instructions:

1. Tie one end of the string to a chair, doorknob, or other support.

2. Put the other end of the string through a straw, pull the string taut and tie it to another support in the room that is higher than the first.

3. Blow up the balloon and hold the opening closed to keep the air inside. Do not tie the balloon.

Note: When you blow up a balloon, you are putting gas particles or **air** inside it. The gas particles do not have shape by themselves and fill the space and shape of its container or in this case, the balloon.

4. Tape the straw to the balloon so that the opening is horizontal with the ground and facing the higher support.

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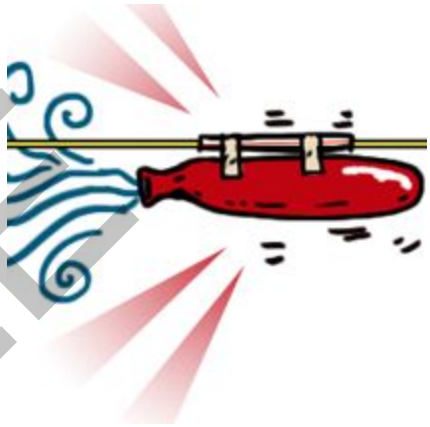
5. While pinching the balloon closed, pull the balloon back to the end of the string [starting line] so that the balloon's opening points toward the support [doorknob, wall, chair, etc.]
6. Before you let it go, make a **hypothesis** or prediction?

   What will happen? Why? How far (or fast) will the balloon go? How many seconds will the balloon take to reach the finish line?



7. Countdown - 5 4 3 2 1, blast off! Let go of the balloon and watch it move along the **track** or string.
   a. As the air rushes out of the balloon, it creates a forward motion called **thrus**t [a pushing force created by energy].
8. Have children test different methods of transporting **cargo** to the finish line by taping different objects to the balloon in bags or small containers. Make these containers with cardstock, construction paper or a cereal box.

Note how fast the balloon moves with different cargo. Predict if the balloon will move slower or faster with more cargo?

Educational Component:

- What happens when you let go of the balloon? What causes this?

The pressure inside the balloon pushes the **gas** or air out when the opening is released. As the gases escape, they exert a force on the outside air, which pushes the balloon forward to travel along the **track** or string.

- How could we make the balloon faster?

Increase the pressure inside the balloon! The more air we put inside of the balloon the greater the force that is created when the air escapes. We can

also increase the downward angle of the. Just like we can ride a bike or run faster down a hill, the balloon travels faster on a downward slope.

- What happens when we add cargo to our balloon rocket?

  The increased weight slows the balloon down. This applies Newton's Second Law of Motion [the speed of an object depends on how hard it is pushed or pulled and its weight]. The **speed** of an object increases with force and decreases with weight.

- How are modern rockets propelled?

  The engines in the rocket create a strong force that pushes against the ground and sends the rocket into the air.