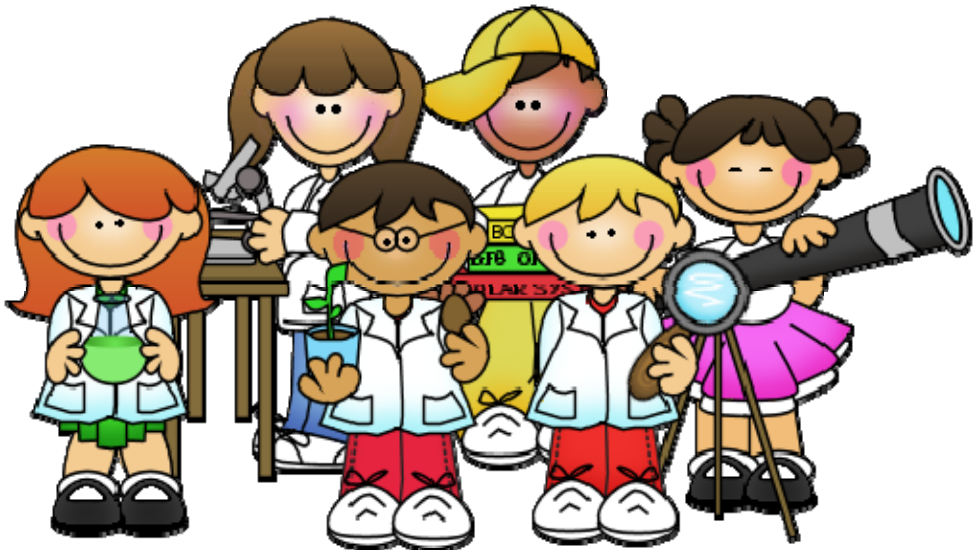
Science Explorers



A Science Activity Handbook
For Early Childhood Professionals

What is science?

A better question to ask is maybe "What is science not?"

Science is not magic!

According to Webster's New Collegiate Dictionary, the definition of science is "knowledge attained through study or practice," or "knowledge covering general truths of the operation of general laws, esp. as obtained and tested through scientific method [and] concerned with the physical world."

Simply put... Science refers to a system of acquiring knowledge.

Who can be a scientist?

Everyone! We are all being scientists when we observe, ask questions, wonder, predict, and try new things! We are all scientists!!!

What should children be learning?

According to the *MN Early Childhood Indicators of Progress*, children make progress in their scientific thinking development when they...

SCIENTIFIC THINKING AND PROBLEM-SOLVING

Observing

1. Use senses to explore materials and the environment
2. Identify and/or describe objects by physical characteristics

Questioning

3. Express wonder about the natural world
4. Ask questions and seek answers through active exploration
5. Make predictions about objects and natural events

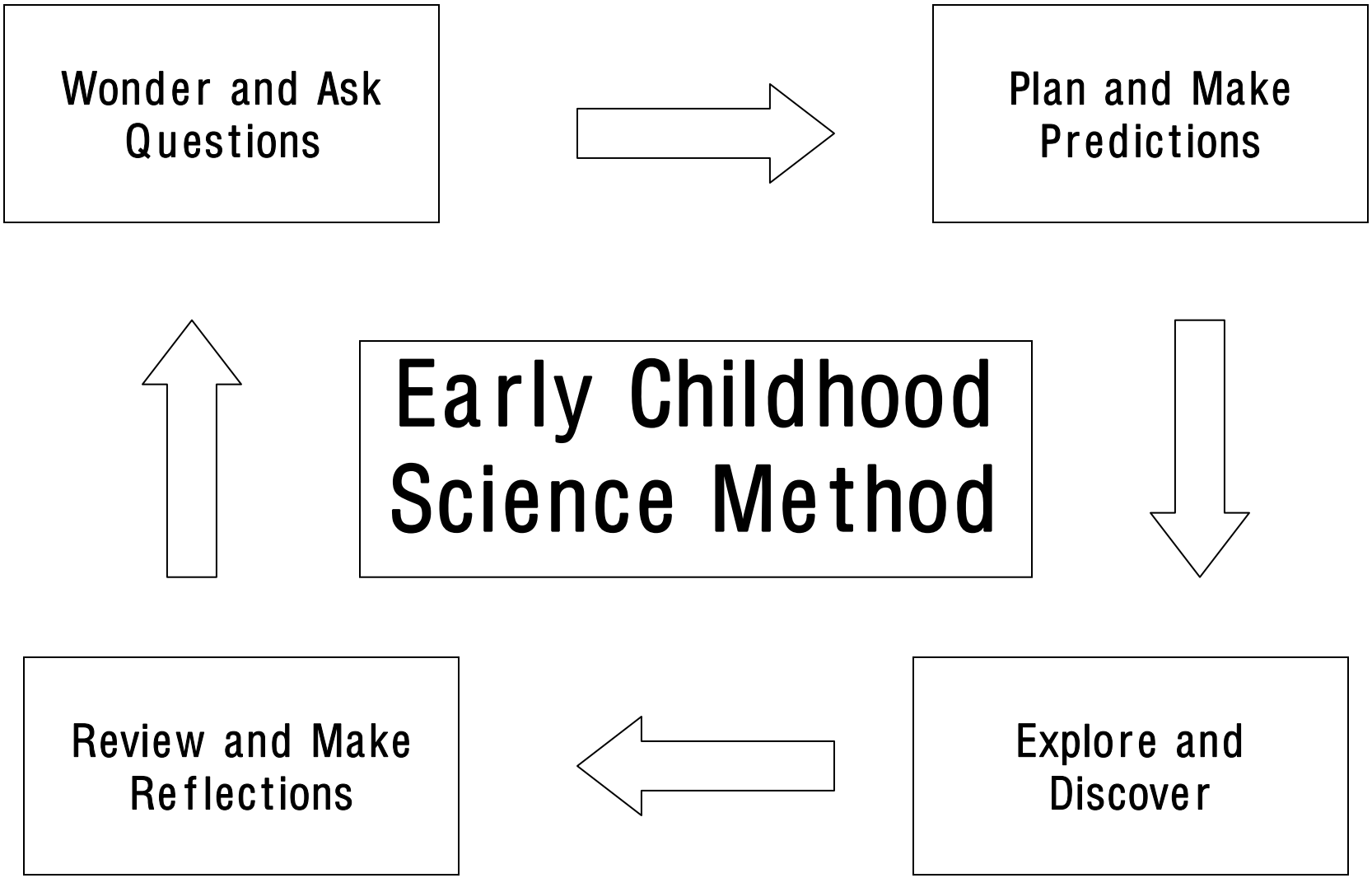
Investigating

6. Use tools (e.g., magnifying glass, binoculars, maps) for investigation of the environment
7. Make comparisons between objects that have been collected or observed

http://education.state.mn.us/mdeprod/groups/EarlyLearning/documents/Publication/009530.pdf

It is important to keep in mind that science activities for young children are net meant to focus on the "ending" outcome, but rather set the foundation for further skills to be acquired and to build a sense of wonder and interest. They are meant to be repeated often and require adult interaction and support.

(What does that look like?) (Do you have to know everything?)



Developmentally Appropriate Teaching Strategies

Teachers help facilitate children's learning and promote inquiry when they:

1. Provide opportunities to investigate natural objects and events
2. Encourage children to experiment and discuss what they observe and learn (Open ended questions)
3. Share information using pictures, language, and through other representations (i.e. making models, taking pictures)
4. Wonder out loud with children and encourage them to ask questions and seek answers through active participation and reflection on what they have discovered
5. Provide materials for a variety of sensory experiences
6. Share in the excitement of new discoveries and explorations
7. Identify and expand on children's individual interests
8. Offer task in which the goal is trying different strategies rather than right or wrong answers
9. Be available to intervene when children encounter problems or become frustrated without "doing it for them"
10. Model the proper use of a variety of familiar and new learning materials, tools, and activities
11. Follow the child's lead when offering suggestions and assisting with problems
12. Allow children ample time to engage in activities

It's about the Process not the Product!

Exploring Matter (Physical Science)

- Matter is anything that takes up space
- There are three "states" of matter- solid, liquid, and gas
- We use our five senses to discover matter, everything you see, hear, touch, or taste is made of matter
- Solids have a shape
- Liquids do not have a shape but can take the shape of whatever they are poured into
- Most gases can not be seen

Vocabulary

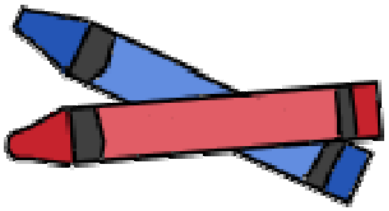
- sight
- sound
- senses
- scent
- vision
- matter
- solid
- liquid
- gas
- mixture
- separate
- experiment
- dissolve
- solution

Activities

- Crayon Cookies
- Shiny Coins

- Bubble Blast
- "Fan"-tastic Fun

Crayon Cookies



Materials:

- Muffin tin
- Old crayons or pieces of crayons
- Heat source- oven recommended

Directions:

1. Invite the children to peel the paper off the crayons and place them in the muffin tin so each is about 1/3 full. Break up bigger crayons to fit in the tin.
2. The children can choose how they would like to **organize** the colors. They can **sort** them or mix them up.
3. Talk about the crayons being a solid. Ask the children to **predict** what will happen to the crayons in the warm oven.
4. Place in the oven and bake for 12-15 minutes on 200° F
5. While waiting brain storm a list of things the children can think of that melt (example: snow, chocolate, cheese.)
6. Show the children the melted crayon wax when it comes out of the oven. Have them make **observations** about what is happening to the wax. Discuss the process of solid to liquid and back.
7. Allow the crayons to cool completely. They should pop right out of the tin.

Shiny Coins

Materials:

- ½ cup white vinegar
- ¼ tsp. table salt
- Spoon
- Glass measuring cup
- Cup
- Dull pennies
- Small bowl
- Timer
- Water
- Paper towels
- Magnifying glasses
- Science journals and colored pencils

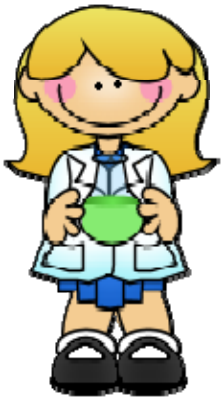
Directions:

1. Mix vinegar and salt in the glass measuring cup and stir.
2. Lay some pennies in the bottom of the bowl.
3. Have the children **predict** what might happen when you pour the solution into the bowl. *(Explain that it is a harmless, weak acid mix but it can cause skin irritation so the children should not touch it.)*
4. Pour the vinegar solution into the bowl.
5. **Observe** as the pennies change from dull to shinny.
6. After about 3-5 minutes scoop the pennies out of the bowl and rinse them in a cup of water.
7. Pat them dry with a paper towel and examine them with **magnifying glasses**.
8. Discuss the changes that were observed in the pennies.
9. Invite the children to document their observations in their **science journals**. Colored pencils would be good to add color detail. Allow children to trace and make rubbings of the pennies in their journals as well.

Bubble Blast

Materials:

- Vinegar
- Baking soda
- Small cup
- Small spoon
- Sqeeze bottle



Directions:

1. Before experimenting, fill small sqeeze bottles with vinegar (easier for children to handle.)
2. Give each child a small cup and spoon and have them place a scoop pf baking soda in their cup.
3. Talk with them about the baking soda, encourage them to describe what it looks like, etc. then ask for **predictions** about what they think might happen if they add vinegar to the baking soda.
4. Give each child a squeeze bottle and invite them to squirt some vinegar into their cup.
5. Talk with the children about what they **observe** happening. Encourage them to **describe** what they **see, smell, hear, and feel.**

"Fan"-tastic Fun

Materials:

- Small floor fan with a protective covering (i.e. sweater bag)
- Different materials of different weights (i.e. tissue paper, feathers, leaves, rocks, construction paper)
- Table cloth or covering for floor

Directions:

1. Place the fan on the floor over a table cloth or covering.
2. Provide different materials for children to test with the fan.
3. Allow the children to place a handful of materials on the fan while it is still off; have them make **predictions** about what will happen to each of the materials when the fan is turned on.
4. Turn on the fan and **observe** what happens!
5. Ask the children **critical thinking** type questions… for example: Why did this item go up but not this item? Why do you think this item doesn't go up? What is happening to the…? What do you think will happen if we do it again?

Exploring Motion (Physical Science)

- Motion means moving
- We use force when we push or pull something
- Force is what makes things move
- Gravity is a force that pulls objects down
- Gravity comes from the middle of the earth
- Friction is a force that makes things stop

Vocabulary

- motion
- surface
- friction
- gravity
- pressure
- force
- ramp
- weight

Activities

- Balloon Races
- Wind Chimes
- Ramps
- Straw Races

Balloon Races

Materials:

- Several different sized balloons
- Straws
- Tape
- String (approx. 30 ft or more)
- Two chairs
- Stopwatch (opt.)

Directions:

1. Cut straws into about 4 inch lengths and tread them on different pieces of string
2. Tie the strings onto two chairs and spread the chairs out so the string is tight
3. Blow up a balloon and pinch it shut, carefully tape it to the straw at one end of the string
4. Have children **observe** and make **predictions** about what will happen if you let go of the balloon opening
5. Let go of the balloon and watch what happens! Encourage the children to **describe** what they saw and **inquire** why they think it happened.
6. Try racing several different kinds of balloons making **predictions** about which will go further/faster… why???
7. Time the balloon races using a stopwatch, make **comparisons** about which balloons went faster and slower, and **wonder** with them "**why?**"

Wind Chimes

Materials:

- Small paper plates
- Hole punch
- Yarn pieces (aprx. 6-8 inches long)
- Tape
- markers
- Variety of objects that will make noise when bumped into each other

Directions:

1. Have the children decorate their paper plate with the markers
2. Help them punch three of four holes along the bottom of the plate close enough for items to touch but not get too tangled. Punch one hole at the top for a hanger.
3. Tie one object to each strand of yarn and tie each strand to bottom holes of plate.
4. Tie a hanger to top and hang outside.
5. **Observe** the chime on a windy day and a not windy day… Ask the children what they notice? Encourage them to make **comparisons** about the kind of weather there is each day. **Wonder** with them about what force is making their chime move… Do they sound different on very windy days? How so? Why?

Ramps

Materials:

- Pre-constructed ramps i.e. rain gutters, cardboard tubes, wood planks, or stiff cardboard, etc.
- Materials to add to ramps to change the surface i.e. sandpaper, corrugated cardboard, fabric, carpeting, etc.
- Blocks to hold up ramps
- Cars and other random items to slide down ramps i.e. corks, bouncy balls, spools, etc.
- Science journals and pencils

Directions:

1. Encourage children to **experiment** and **explore** the position and motion of objects as they go down the ramps.
2. **Wonder** with them about items that stick and items that slide down quickly… why does that happen? How fast can cars go down the ramps? What if one ramp was higher? What happens when you change the surface? Why?
3. Make a chart **comparing** which items go the fastest, slowest, farthest, etc.
4. Allow the children to repeat their experiments over and over. Do they still get the same results? Why or why not?
5. Encourage the children to draw their ramps in their journals and record their discoveries. i.e. mark an X on the ramp where the cars stop.

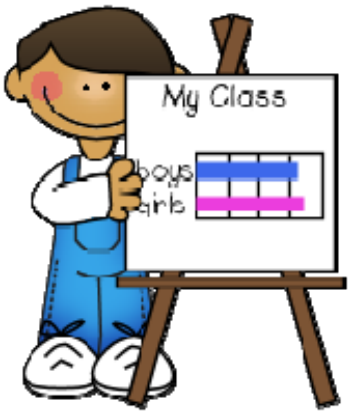
Straw Races

Materials:

- Package of drinking straws
- Variety of materials for children to blow at i.e. cotton balls, feathers, pompoms, tissue paper, toy cars, bouncy balls, small wooden blocks, keys, rock, package peanut, paper cup, stick, etc.
- Flat smooth surface like on a table, cookie sheet, or tray

Directions:

1. Begin by **exploring** the objects with the children and encourage them to **describe** some of the **characteristics** of each object. Specifically discuss the weight of the objects.
2. Ask children to **predict** which objects they think they will be able to move by blowing with their straws at them, why? Record their predictions on a chart.
3. Invite children to choose objects to blow at with the straws, how does what really happened **compare** to their predictions?
4. Invite the children to have straw races, chose two or three items and ask the children to blow at them predicting a head of time which will win based on what they have discovered about the objects from their experiments. Ask them to **determine** if their predictions were correct? Why or why not? What other factors might have contributed to the outcomes?



Exploring Water (Physical Science)

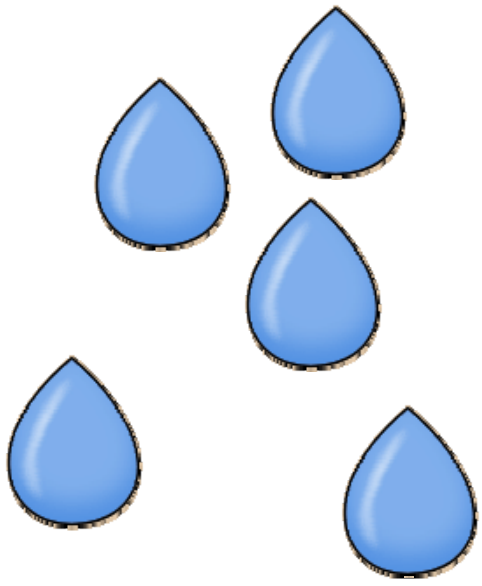
- Water is most commonly found as a liquid and it comes in many forms; rain, rivers, oceans, lakes, ponds, streams, from the sink, etc.
- In its solid form water can be snow, frost, or ice
- To remain a solid water needs cold temperatures
- People need water to live; as do all living things
- Some things sink in water and other things float

Vocabulary

- melt
- freeze
- solid
- liquid
- sink
- float
- temperature
- surface tension
- buoyancy

Activities

- Pennies in a Cup
- Water Drop Discoveries
- Sink the Ship
- Ice Excavation



Pennies in a Cup

Materials:

- A small clear bowl or cup
- A plate or tray to set cup/bowl on
- Water
- Container of pennies
- Prediction sheet
- Pen or marker

Directions:

1. Set the cup/bowl on a tray or plate and fill it to the rim with water.
2. Ask the children to **predict** how many pennies can be added to the cup/bowl of water before the water spills over. **Record** their predictions on the prediction sheet.
3. Count the pennies as you carefully slide the pennies into the cup.
4. When the water overflows discuss with the children what they saw happen and why they think that happened. Ask some **critical thinking questions**. How many pennies were you able to get in before it spilled over? Do you think it would be the same if someone else tried it? What is happening? Why? How close was your prediction? (Hint: Watch the rim at eye level when it starts to get really full of pennies.)
5. Encourage the children to try the experiment on their own. Let them repeat it as many times as they wish! Good scientists always **test** their experiments over and over again!

Pennies in a Cup Prediction Sheet

Trial 1

Name	Prediction

Actual Count _____

Trial 2

Name	Prediction

Actual Count _____

Trial 3

Name	Prediction

Actual Count _____

Trial 4

Name	Prediction

Actual Count _____

Water Drop Discoveries

Materials:

- Cookie sheet
- Wax paper
- Blocks or something to prop up cookie sheet
- Masking tape
- Medicine droppers (pipettes)
- Small container of water
- Paper towels

Directions:

1. Tape a piece of wax paper to a cookie sheet covering the whole bottom of the cookie sheet.
2. Use a medicine dropper and put drops of water on the wax paper. **Discuss** what happens to the water, **Notice** with the children how the water pools together and stays as a droplet. Why?
3. Next raise one end of the cookie sheet and prop it up. Drop water on the wax paper one drop at a time and observe what happens. How many drops does it take to get the water to start to roll down the wax paper? Why does it take so many?
4. **Wonder** with the children if the results would be the same if you used a paper towel in place of the wax paper. Have them make **predictions** and then **test** their guesses.

Sink the Ship

Materials:

- Marbles or flat marbles
- Aluminum Foil
- Container of water

Directions:

1. Set out the supplies and invite the children to watch the experiment.
2. Ask the children if they think a piece of foil will sink or float? Place a piece of foil on the water and see.
3. Show the children the marbles. Ask them to **compare** them, how are they the same? Different?
4. Ask the children to **predict** what they think would happen if the marbles or flat marbles were added to the foil. Add one at a time and find out. What happened? Why?
5. Ask, if the shape of the foil changed would the same thing happen? Make a simple boat out of the foil by giving it sides. What might happen? How many marbles will it hold this time? Try it again!
6. **Discuss** and **wonder** with the children what they think might be happening! Repeat the experiments again!

Ice Excavation

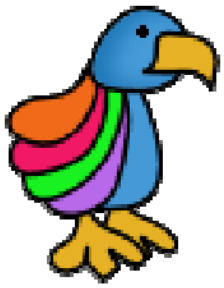
Materials:

- Medium sized container to freeze water in like a dishwashing tub
- Small sturdy toys or other items like rubber bands, pom-poms, blocks, etc.
- Safety goggles
- Plastic hammers and golf tees
- Magnifying glasses
- Small rulers
- Large tub or plastic container to place frozen water in

Directions:

1. Several days in advance fill medium container with water and add toys and other items, and freeze until solid.
2. Remove frozen water and place into a big tub or plastic container for children to begin excavating.
3. Show the children the frozen water with the items in it. Ask them to **describe** what they see. What is it? What is inside it? How did the items get inside the ice? What makes it ice? Will it stay frozen? Why or why not? How do they think they can get the items out?
4. **Model** for the children how to carefully chip at the ice with the hammers and tees. Talk about how scientists that dig up dinosaur bones are very careful when they dig so the bones don't get broken. (You can tell them about paleontologists, people who study dinosaurs, and archeologists, people who study people/artifacts from the past, at this time!)
5. Have the children wear safety goggles (sun glasses work too) and invite them to begin excavating.
6. As they excavate encourage them to talk about what they are doing and how they are getting the items out. Did they find other things? How do they know what the items are?

Exploring Animals (Biological Science)



- Animals have a life cycle
- Animals need air, water, and food to survive
- Animals get energy from the food they eat
- Animals grow
- Animals change
- Animals have similarities and differences
- Animals survive by adapting to their environment

Vocabulary

- Life Cycle
- Growth
- Habitat
- Camouflage
- Environment
- Herbivore (Plant Eater)
- Omnivore (Meat & Plant eater)
- Carnivore (Meat Eater)

Activities

- Animal Sort
- Dino Discoveries

Animal Sort

Materials:

- Pictures of animals cut from magazines or printed from internet or from coloring books
- Categories for sorting listed on pieces of paper (i.e. where do they live? Warm weather, cold weather, in the water, on land… or How many legs do they have? What kids of body covering do they have?)
- Books about different animals to use as a resource for information

Directions:

1. Show the children the pictures of the animals. What do you notice about the animals? Encourage them to notice that some have fur, some have two legs some have four, etc.
2. Invite the children to come up with ways to sort the animals. Ask questions to help them make categories. i.e. What do you think animals need that live where it is cold? Would animals that live where it is hot need lots of fur? Why or why not? How can you tell if an animal lives in the water? What might animals that live where it is cold look like? What about where it is warm?
3. Encourage them to use the books as a resource to find answers or check their predictions.

Dino Discoveries

Materials:

- Plastic Dinosaurs, pictures of dinosaurs or Dinosaur stamps
- Sorting Chart (Meat eaters, Plant Eaters)

Directions:

1. Show the children the different dinosaurs. **Discuss** with the children and encourage them to notice the different characteristics of the dinosaurs. i.e. some are big, some are small, some have long legs, long necks, sharp teeth, etc.
2. **Wonder** with them why the dinosaurs might have these different characteristics. Talk about how dinosaurs that eat meat, carnivores, often have sharp teeth and are fast runners. Ask what dinosaurs that are veggie eaters, herbivores, might look like?
3. Invite the children to use a sorting chart to **sort** the meat eaters from the veggie eaters.
4. Encourage the children to think of other ways to **classify** the dinosaurs.

Exploring Bugs (Biological Science)

- Bugs have a life cycle
- Bugs need air, water, and food to survive
- Bugs grow
- Bugs change
- Bugs are called Insects
- Most Bugs have three body parts, a head, a thorax, and an abdomen and most have 6 legs
- Some bugs are very helpful to our environment
- Some bugs fly, some don't

Vocabulary

- Life Cycle
- Growth
- Environment
- Head, thorax, abdomen (See Song Chart)
- Metamorphosis (to change)

Activities

- Backyard Bugs
- Butterfly Beginnings
- Insect Investigations

Backyard Bugs

Materials:

- Variety of real or plastic bugs for children to examine (go on a walk and collect them from your yard in plastic containers)
- Magnifying glasses
- Small rulers
- Small plastic containers
- Science journals, colored pencils
- Books and posters about bugs

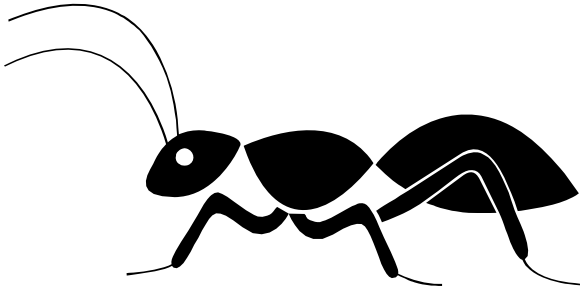
Directions:

1. Introduce the activity by reading a fun story about bugs with the children. Teach them the *Insect Body Part* Song!
2. Invite the children to go on a "bug hunt", give them plastic containers to put their bug **collections** in. Stress the importance of not hurting the bugs! (I have used plastic bugs in my classroom when it was not optional to go outside.)
3. Bring bugs back to house/classroom to **examine and investigate**, provide tools such as magnifiers and rulers for children to get a closer look and make some measurements.
4. Encourage children to draw their bugs in their journals.
5. Ask lots of **critical thinking questions and wonder** about the bugs with them: What do you notice about the insects. Can you identify the body parts? Do they all look the same? Do some have wings? How do wings help the bugs? How many legs do they have? What else do you notice about their bugs? Where do you think the bugs live? Why? I wonder what they eat…
6. Encourage the children to look in the books provided to help them find answers to their questions. The internet can be a good **resource** to find answers too.
7. Have the children release any live bugs they have found after they are done investigating them.

Insect Body Part

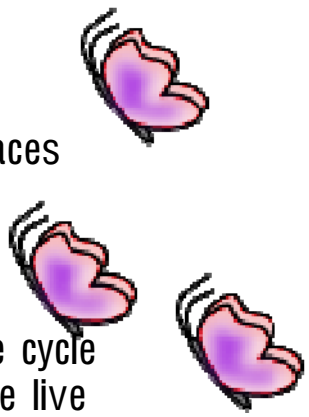
(sung to *Head and Shoulders, Knees, and Toes*)

Head and thorax abdomen, abdomen
Head and thorax abdomen, abdomen
One, two, three, four, five, six, legs
Head and thorax abdomen, abdomen



*point to your own body parts as you sing, the thorax is like the chest and the abdomen is the belly. For the legs point fingers out one at a time next to your belly doing three fingers on each side of your body to represent the six legs.

Butterfly Beginnings (Life Cycle Model)



Materials:

- Empty Egg cartons, cut unto sections w/ four egg spaces
- Pasta shapes, balls, spirals, shells, and bowtie
- Glue
- Books about butterflies
- Optional- Science journals, colored pencils, butterfly life cycle posters, puzzles, manipulatives, If possible collect some live caterpillars (They can also be purchased from Insect Lore http://www.insectlore.com) For an ongoing real life investigation!

Directions:

1. I like to introduce this topic by reading the story The Very Hungry Caterpillar by Eric Carle. The children are usually familiar with it and it creates interest.
2. If you have real caterpillars let the children **investigate** them. Ask them to make predictions about how long they think it will take for the caterpillars to create their chrysalis (cocoon). Track the changes each day and keep track of how many days each stage of the butterfly life cycle takes. (Science journals)
3. Invite the children to **create a model** of the butterfly life cycle. Show them the materials and explain how to create the model using the pastas. (Glue one pasta shape in each section of carton ball=egg, spiral=caterpillar, shell=cocoon, bowtie=butterfly)
4. Provide each child with the necessary materials and assist them in creating their models. (Maybe helpful to have one pre-made for them to look at.)
5. **Discuss** each stage of the butterfly life cycle and encourage them to share what they know about the "changes" or metamorphosis that the caterpillar/butterfly is going through.
6. Help them understand that after the butterfly comes out of its cocoon/chrysalis it will start the process over again and female butterflies will lay more eggs.

Insect Investigations

Materials:

- A variety of pictures of insects or plastic replicas of a variety of insects
- Insect Sorting Chart
- Blank sorting charts and markers for creating their own charts

Directions:

1. Encourage the children to investigate the bugs.
2. Ask **open ended questions** such as what do you notice about the insects? How are they alike? How are they different?
3. Ask the children how the insects might be **sorted**? What other ways could they be sorted?
4. Show them the sorting chart and demonstrate how they can use the chart to **classify/sort** the different kinds of insects.
5. After they have attempted the activity invite them to create their own ways to sort and classify the insects and provide them with blank sorting charts and markers to make their own charts.


Insect Sorting Chart


Insects that fly	Insects that don't fly

Insects with six leg	Insects with many legs

Insect Sorting Chart

Exploring Plants (Biological Science)

- Plants have a life cycle
- Plants need air, water, nutrients, and sunlight to survive
- Plants make their own food using energy from the sun
- Plants get nutrients from the soil
- Plants give off oxygen
- Oxygen is in the air we need it to breathe
- Plants grow
- Plants change
- Not all plants are alike

Vocabulary

- Life Cycle
- Growth
- Energy
- Stem
- Roots
- Seeds
- Flower
- Soil
- Nutrients
- Oxygen

Activities

- Growing Grass
- Looking at Leaves
- Pumpkin Predictions

Growing Grass

Materials:

- One paper cup per child, labeled with each child's name. (Sharpies write well on cups.)
- Light Source (i.e. a window)
- Soil (any type of potting soil)
- Spray Bottles (small- filled with water)
- Grass Seeds (we use a shade variety)
- Scoop and spoon
- Plastic Wrap
- Science Journals
- Colored Pencils
- Rulers
- Magnifying Glasses

Directions:

1. Label children's cups and invite them to fill the cups ¾ full with soil
2. Let them sprinkle a spoon full of seeds into the cup and gently shake the cup a little to settle the seeds
3. Allow them to spray the seeds with the water pray bottles. The seeds should be fairly wet!
4. Invite children to record in their journal what their seeds look like. Provide them with magnifiers, and colored pencils.
5. Cover seeds with plastic wrap to keep them moist (until their start growing) and place them in a well lit window.
6. Invite children to observe their seeds each day they attend. Encourage them to record their observations in their journals. Provide magnifiers and rulers for making observations and vocabulary cards for children to copy into their journals.

Exploratory Questions:

How soon do you think your seeds will germinate/sprout (start growing)?
How can you tell if your grass is growing?
What tools can you use to learn more about your grass?
What do seeds need to grow? Why?
Why are some growing faster than others?
What do you notice about your seeds/grass?
How tall do you think your grass will grow? Why?

Looking at Leaves

Materials:

- Paper bag for each child to collect a variety of leaves (Best done in fall when leaves are on the ground)
- Magnifying glasses
- Rulers
- Paper, crayons with paper peeled off (fat crayons work best) (or use Journals)

Directions:

1. Take the children on a nature walk and have them collect a variety of leaves in their bags.
2. Bring them back to the house/classroom and encourage them to observe and investigate their leaves.
3. Provide them with science tools like magnifying glasses and rulers to make observations with.
4. Talk with the children about their leaves, what do they notice about them? How are they alike, different? What do they see if they use a magnifying glass.
5. Talk about the "job" the leaves have; collect sun to help the tree make food so the tree has energy to grow.
6. Invite the children to make rubbings of their leaves on the paper or in their journals.
7. Encourage them to sort their leaves by noticing different characteristics about them.

Pumpkin Predictions

Materials:

- Several Pumpkins of Various Sizes
- Large Scoops or Spoons
- Newspaper
- Pumpkin Prediction Chart (one for each pumpkin)
- Knife for adult only to use to open pumpkins
- Cookie sheets or plastic containers to put seeds in

Directions:

1. Show the children the pumpkins and ask them what they think they might find inside them if they cut it open.
2. Ask them to predict how many sees they think each pumpkin will have. Record their predictions on the charts.
3. Lay newspaper over tables and cut the pumpkins open adult)
4. Allow the children to scoop out the insides collecting the seeds in the containers or on cookie sheets
5. When done count how many seeds were in each pumpkin.
6. Talk about which one had more, less why?
7. Ask more questions to get the children wondering and thinking… How come all pumpkins don't have the same number of seeds, what did you notice about how many seeds they had did the size of the pumpkin matter? How? What would happen if we planted the seeds?

Pumpkin Predictions

Exploring Color (Chemical Science)

- Colors can mix to make new colors
- There are primary colors and secondary colors
- Primary colors are red, yellow, and blue and can be used to make all other colors
- Colors get lighter or darker when mixed with white or black

Vocabulary

- Color
- Tint
- Primary Color
- Secondary Color

Activities

- Color Filters
- Color Tubes/Bottles
- Color Mixing bags

Color Filters

Materials:

- Red, yellow, and blue food coloring or liquid water color
- Small containers or "test tubes"
- Coffee Filters
- Pipettes/medicine droppers
- Paper towels
- Trays or cookie sheets

Directions:

1. Fill small containers or test tubes with watered downed colors of food coloring or liquid water color. Place a pipette in each color.
2. Give children a coffee filter on a paper towel lined tray.
3. Invite the children to experiment with the colors by drawing the colored liquid into the pipette and squirting it out onto their filter.
4. Encourage them to make predictions about what will happen when they squirt the colors out. What do they notice? What happens when they add other colors? What new colors are they making? How?
5. Children can keep the fillers to take home once they are dry.

Color Mixing Bags

Materials:

- Large Plastic Zip Shut Bags
- Shaving Cream
- Primary Colored Tempera Paints
- Clear Packaging Tape

Directions:

1. Fill a plastic bag with some shaving cream. Squirt two of the paint colors in the bag at opposite ends. Squeeze out extra air and zip shut. Secure with package tape so it will not open.
2. Give each child a bag and invite them to start squishing the bag with their fingers to move the colors around.
3. Encourage them to make predictions about what will happen when they squish the colors together. What do they notice? What new colors are they making? How?
4. Give them another bag with different colors to try next. Ask them if they think they will get the same results. Why or why not?

Color Tubes/Bottles

Materials:

- Clear plastic pop/water bottles or "test tubes"
- Yellow vegetable oil
- Water
- Red and blue food coloring or liquid water color.
- Hot glue (used by adult to glue bottles shut)

Directions:

1. An adult should make a color bottle filling half of it with oil and half with water colored with one of the food coloring or liquid water color. Make at least one of each color, red in one bottle blue in the other. Glue lids on so they can not be opened.
2. Invite the children to observe the bottles (keeping them still so they do not mix.) What colors do they see? How might the colors get mixed and what will happen if they do?
3. Encourage the children to shake the bottles up. What do they notice? How did they change? Do they stay the new color? Why or why not?

Crazy Concoctions

*Mix these recipes with the children. Have them assist when possible. Talk about what is happening and as with all activities encourage the children to make predictions about what they think will happen when the ingredients are added together.

Ask questions like:

Why do you think that happened?

How do you know that?

What do you think will happen if…?

What happened to the (name of ingredient)?

Talk about what it means when something dissolves; explain what a mixture is (when two or more ingredients are combined to make a new concoction.)

Talk about solids and liquids. How are they the same? different?

Flubber

In one bowl mix
1 1/2c. warm water
2c. Elmer's Glue
Food Coloring of your choice

In second bowl mix
4 tsp. Borax (Found with the Laundry Detergent in stores)
1 1/3 c. warm water

Mix ingredients in separate bowls well. Then pour glue mixture into Borax mixture and stir if needed. It is an instant chemical reaction!

Oobleck

1 1/2c. cornstarch
1c. water
food coloring

Mix the ingredients and allow the children to play with the mixture. When "pushed" together, the mixture will appear dry and solid; as the children let go of the mixture, it flows like a smooth liquid.

Glurch

Mix two cups of white glue with one cup of liquid starch. Add more glue if it is too wet or more starch if it is too sticky.

This is similar to Flubber but stretchier!

Exploring Concoctions (Chemical Science)

- A "reaction" can occur when you mix different ingredients together
- Ingredients sometimes change when mixed together, sometimes not
- Reactions are different when you mix different ingredients together

Vocabulary

- Ingredient
- Mixture
- Reaction
- Change
- Effect
- Dissolve

Recipies

- Flubber
- Oobleck
- Glurch