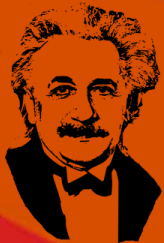
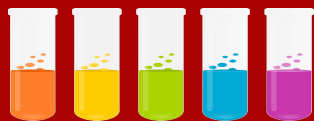
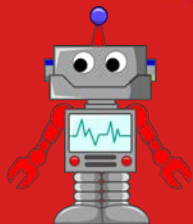




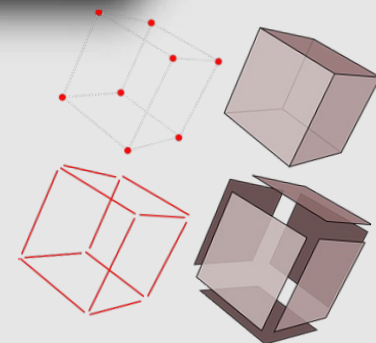
Math & Science Activities



$$E = mc^2$$



Theresa Vadala, Ed. D.





**Applying New Knowledge:
Learning & Transfer**

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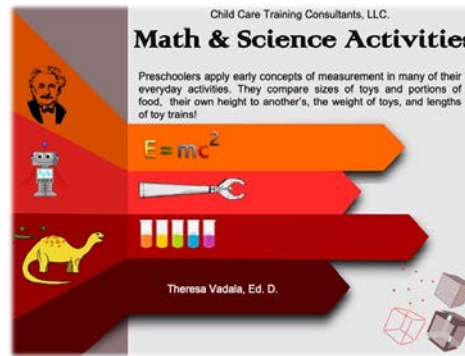
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Math & Science Activities

Theresa Vadala, Ed. D

Child Care Training Consultants, LLC

Las Vegas, Nevada 89139



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PRESCHOOL Module 2

CDA Subject Area 2: Children’s Physical and Intellectual Development

Title: CDA PHY.INT 2.H Math & Science Activities for Preschoolers

1 Hour

0.1 CEU



**Dr. Theresa Vadala
(Instructor & Curriculum Designer)**



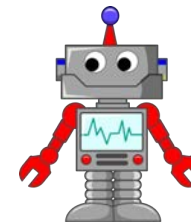


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**Thank you for choosing
Child Care Training Consultants, LLC.,
for your CDA Training Needs!**



Learning Assessment

Read the material provided, take the 5-10 quiz questions and
complete the training evaluation at the end of the course.

Participants must receive 100% on individual courses to obtain a certificate of completion.

Questions?

We are happy to help.



Support Services:

Please contact us 24/7 at

childcaretrainingconsultants1@gmail.com

Business # 702.837.2434

$$E=mc^2$$



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Child Care Training Consultants LLC., Goal

The goal is to empower educators as they take Child Development Associate (CDA) courses to make a powerful difference in the lives of young children!

Mission Statement

“Child Care Training Consultants, LLC’s is committed to provide research-based professional growth and development training courses primarily focused on the Child Development Associate. The CDA is the nation’s premier credential that is transferable, valid, competency-based and nationally recognized in all 50 states, territories, the District of Columbia, community colleges and the United State Military.

Vision

Child Care Training Consultants, LLC’s vision is to provide the early childhood community with courses based on CDA competency standards to obtain their CDA Credential and assist in reaching their goal as an exceptional early childhood educator to ultimately achieve higher child outcomes.



**Applying New Knowledge:
Learning & Transfer**

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About the Instructor

Theresa has over 30 years experience in the field of Early Childhood Education. During that time, she served as a Preschool Teacher, Disabilities Coordinator, Program Facilitator, and Director of an Early Childcare Program. She has a Doctoral Degree in Educational Leadership with Specialization in Curriculum and Instructional Design. Theresa is a Professional Growth & Development Trainer and Curriculum Designer and offers web-based courses internationally. She is the Executive Director/Owner of of the training organization Child Care Training Consultants, LLC., (CCTC).



Business Description

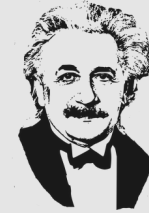
Child Care Training Consultants, LLC. (CCTC) is an accredited provider (AP) with the International Association for Continuing Education and Training (IACET) that provides Continuing Education Units (CEU) for adult education nationally. The business is also a recognized training organization with the Council for Professional Recognition, Child Development Associate Council (CDA), National Credentialing Program.

Research

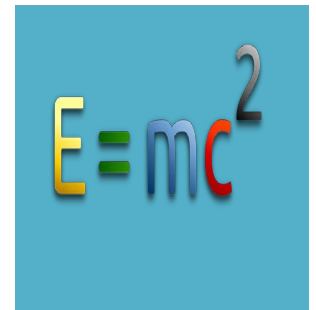
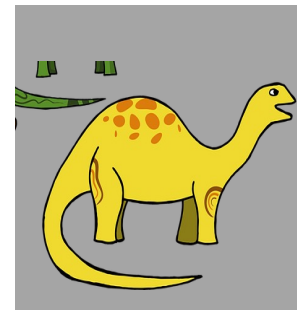
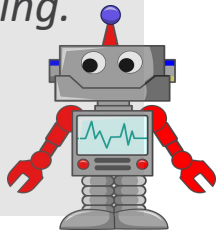


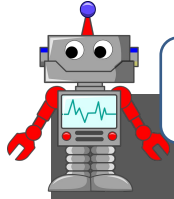
Research shows that preschool and kindergarten children's knowledge of, and interest in math and science predicts later success in STEM. Studies also show that early math knowledge is a predictor of later reading achievement.

Children have very positive attitudes toward mathematics and science during the preschool years. Students have opportunities to use mathematics and logical thinking to solve problems and help children develop dispositions such as curiosity, imagination, flexibility, inventiveness, and persistence.



Exploring Math and Science in Preschool takes a familiar preschool activity and shows us how to build on it, describing in detail with additional activities and strategies to enhance children's understanding.





Needs Analysis

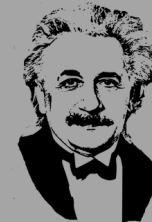


Young children enjoy solving problems and exploring the world through science, technology, engineering, and math (STEM).

STEM learning can support children's early math development and many other important skills.



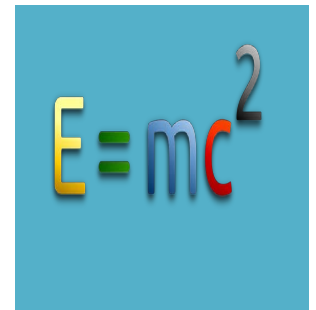
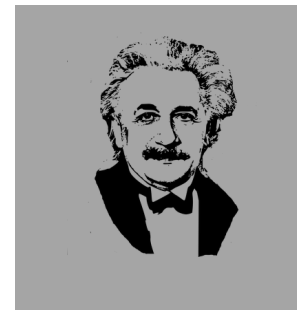
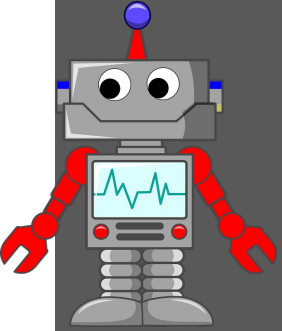
Students may have been exposed to basic concepts in math and science, but they did not develop a level of mastery necessary to progress to higher levels needed for school readiness.



$$E = mc^2$$

Goal

The goal is to provide early childhood educators with STEM-based exploration activities to implement into daily teaching practices.



Objectives



Objective 1: Participants will:

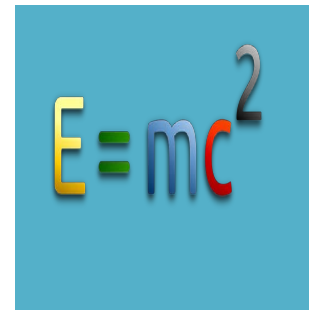
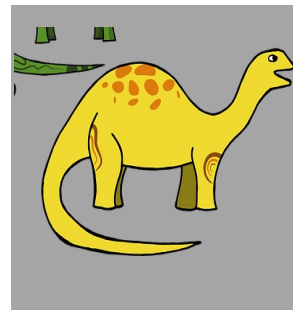
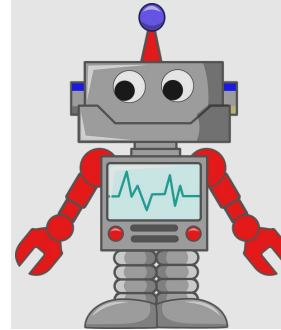
Identify math skills in everyday play and implement math activities into daily teaching practices.

Objective 2: Participants will:

Identify the importance of implementing science reasoning and inquiry activities into daily teaching opportunities.

Objective 3: Participants will:

Identify strategies on how to engage families in working with their children to reinforce math and science activities in the home.

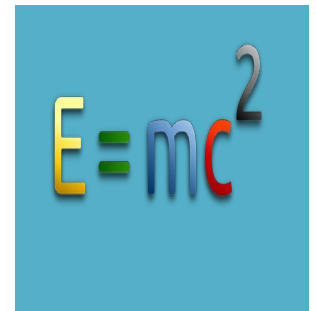
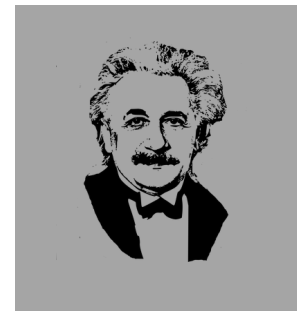
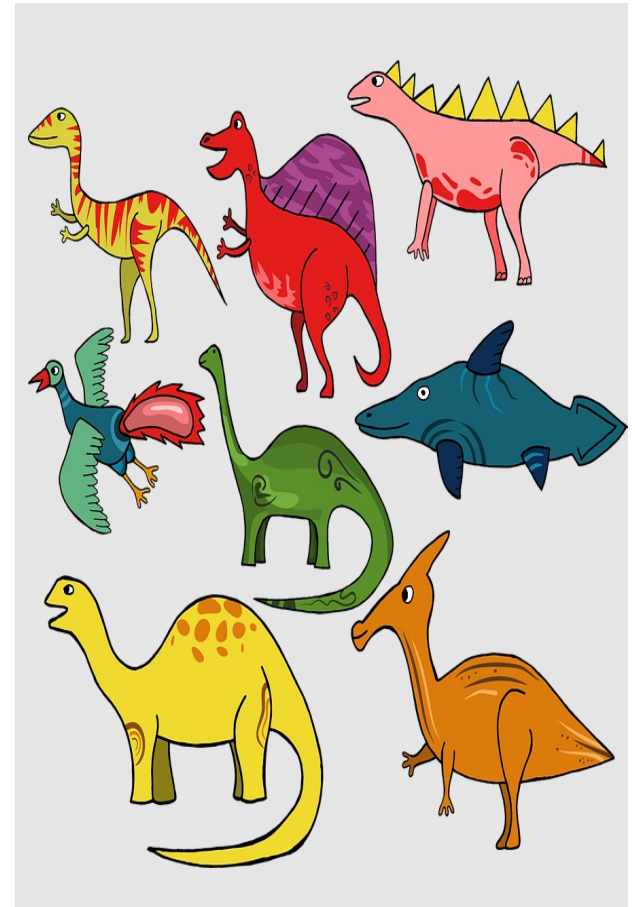
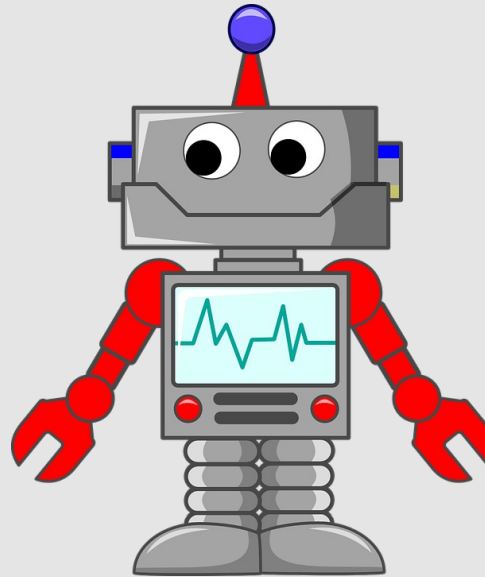


Learning Outcomes



The learning outcomes are to:

- Identify 4 major math learning skills
- List 3 activities that demonstrate patterns and shapes
- Describe 3-5 ways on how to engage children in scientific inquiry during daily teaching practices.



Agenda



Part 1:

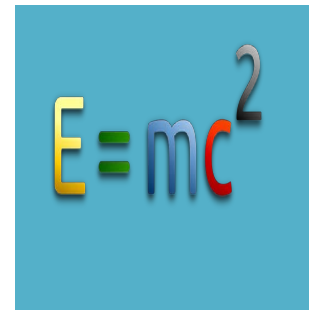
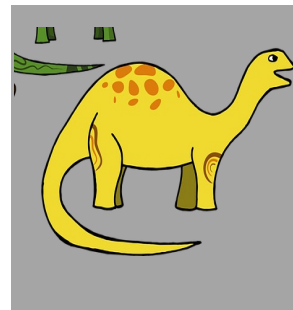
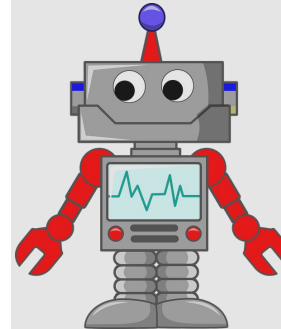
- Math in Everyday Play
- Math Activities
- Review

Part 2:

- Science Reasoning & Inquiry
- Science Activities
- Review

Part 3:

- Engaging Families
- Review
- References
- Transfer of Learning
- Evaluation



Part 1



Part 1:

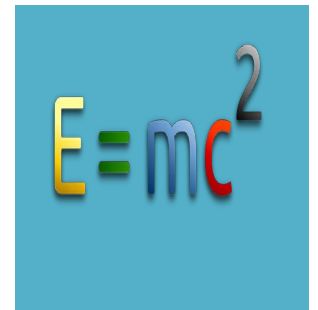
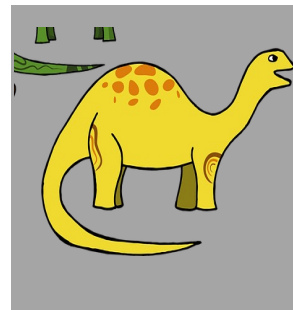
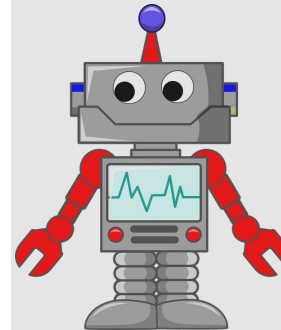
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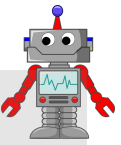


Math in Everyday Experiences

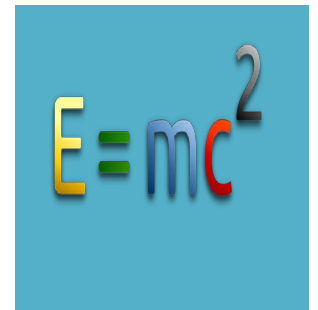
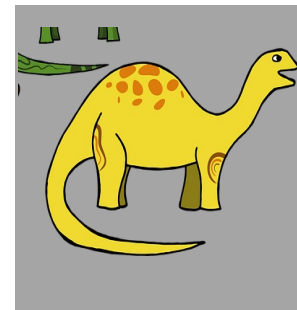


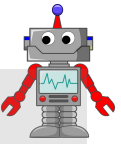
In preschool, math is an everyday experience for students.

Preschoolers do math while singing, moving, dancing, eating lunch, playing, and in everyday learning. It is essential the math skills be pointed out!



Preschool math helps students make sense of the world around them and teaches them to reason and problem-solve. Teachers must build on children's prior knowledge and capitalize on their spontaneous discoveries to further their understanding of mathematical concepts.





Math



Numbers:

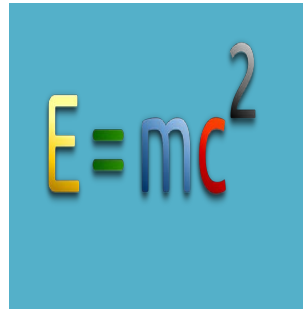
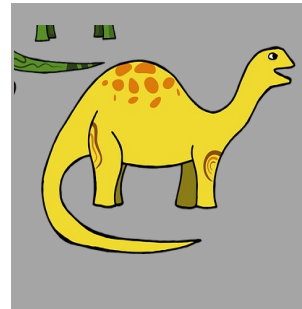
In preschool math, children learn about numbers by counting objects and discussing the results. Children count spaces on board games. They count the days until their birthdays. The teacher might say, "Yesterday there were 5 days until your birthday. How many days are there now?" Preschoolers read counting books and recite nursery rhymes with numbers.

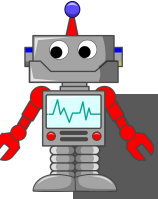
Geometry and Spatial Relations:

Children practice constructing shapes and discussing their properties. They see small triangles and big triangles and upside-down triangles and gradually realize that they are all still triangles.

Measurement:

Children compare the height of a block tower with the height of a desk or table. They measure each other and the distance from the book corner to the water table. They learn that a block is too short to make a bridge over the road. Preschool math teachers reinforce children's findings by asking questions and making observations: "I wonder if this block is long enough to bridge the road."





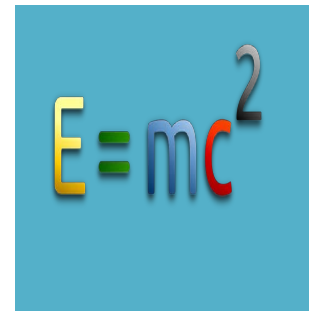
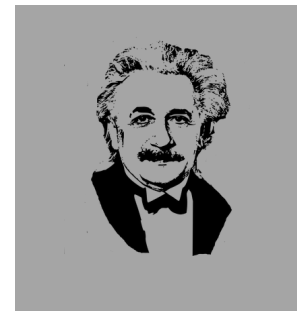
Math



Patterns/Geometry:

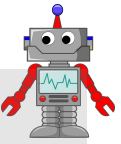
Children become aware of patterns in their clothes. They learn to recognize patterns of different colors and sizes in manipulatives and blocks. They practice reproducing simple patterns by placing objects in a patterning order.

Analyzing data: Children sort objects by color, size, and shape, count them, and record the data on graphs and charts. These charts might reflect the class pet's growth, the number of rainy days in February, how many bean plants have sprouted, or the number of children with a birthday in March.





The Four Major Math Learning Skills



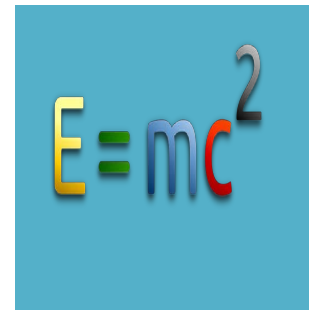
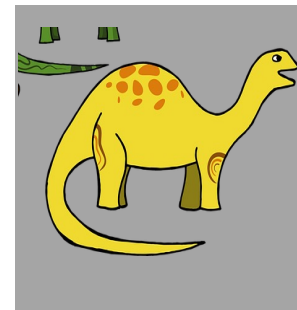
Math is an important part of learning for children in the early years because it provides vital life skills. They will help children problem solve, measure and develop their own spatial awareness.

1. Counting - Students are beginning their experience with numbers through counting, number games and written numerals. Students are learning to count objects and understand a one-to-one correspondence.

2. Addition & Subtraction - Students are putting together and adding to and subtracting as taking apart and taking from.”

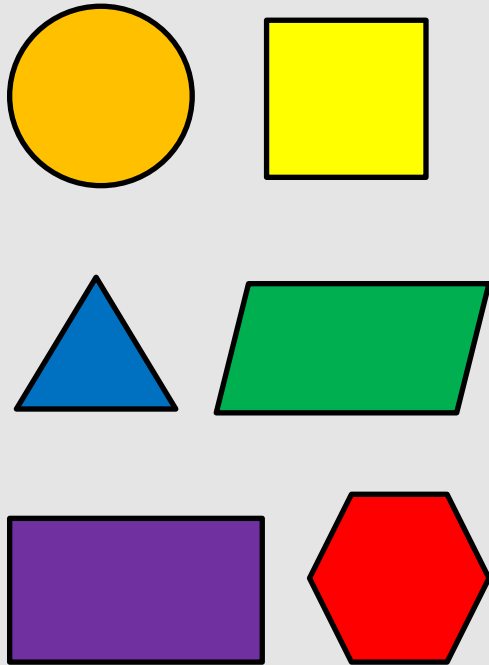
3. Measurement & Data - Young children are beginning to describe and compare their physical world. They are starting to classify, sort and group objects into categories.

4. Geometry - Students are starting to compare two-dimensional (flat) and three-dimensional (solid) shapes. They are using appropriate language to recognize different shapes and talk about their attributes.



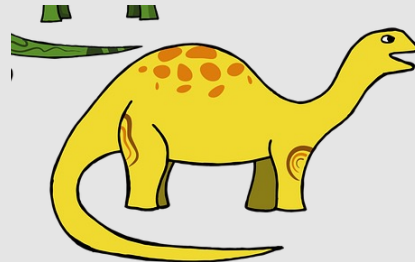
Math: Shapes & Movement Activity

Objective: Students will identify shapes through a variety of movement activities



Materials

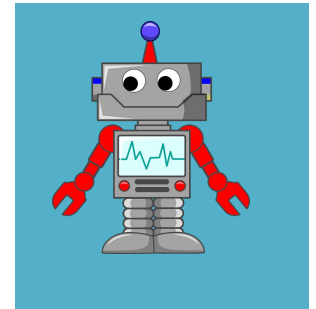
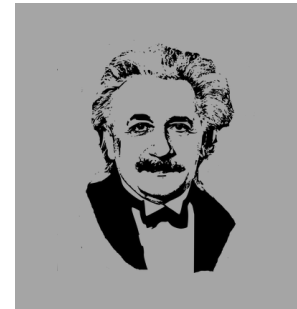
Paper (Boxed food cardboard) Precut shapes or students can cut out shapes.



Directions

Teach students how to identify shapes. Give student two shapes. Tell student to hold a circle in their right hand and a triangle in their left hand. Give verbal directions such as take two steps forward and raise the circle, once raised, instruct student to put the circle down and raise the triangle. Continue this using a variety of positional words.

Variation/s: Use other shapes, colors, numbers, letters or sounds. Move like a robot! Walk like a dinosaur!



Math: Measuring Distance Activity

Materials

String/Yarn, plastic insects/spiders or small toys/blocks.



Objective

The student will measure the distance between objects found in the classroom, home or outdoors using a string/yarn, then measuring the string/yarn with a ruler.

Variation/s:
Measure the distance by walking heel-toe and count the steps.

Directions

Hide 3-5 plastic bugs in the classroom, house or outdoors. Tell student that you hid some plastic bugs in the house/yard. The student will look for the item, tell you what is, leave it in the same place, and search for another item. When the next item is found, assist the student in using the string/yarn to measure the distance. Use a ruler to measure the string/yarn.

Math: Measure and Compare Activity

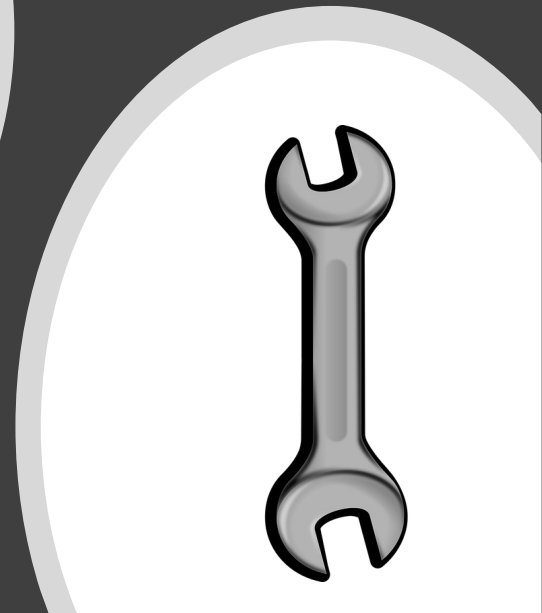
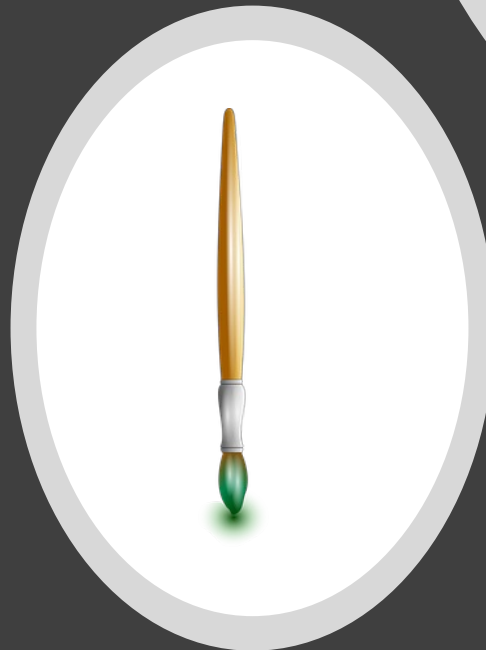
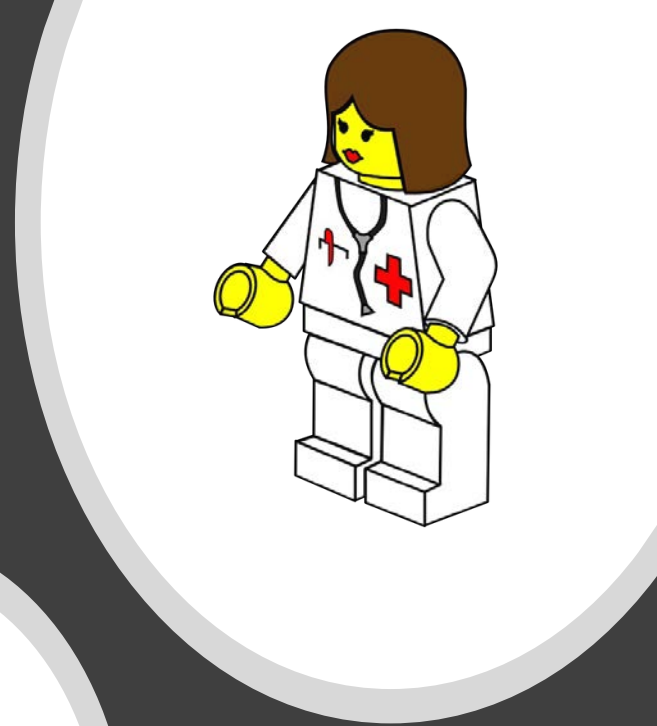
Directions

Place a few small household objects in a container. Set out a ruler on the table or desk. Have student take an object out the container and place next to the ruler. Have the student say the number on the ruler where the object ends.

Materials

Variation/s: Make a graph with numbers 1-12. Compare the different sizes and ask student to say which object is sorter, longer, or the same size. Talk about weight - lighter/heavier.

Objective: The student will measure and compare objects based on length using a variety of objects found in the classroom/home and verbalize whether it is sorter, longer, or the same size.



Math: Shapes & Movement Activity

Materials

Objective: Students will be able to draw a city on chart paper or butcher paper and identify the 2D & 3D shapes by drawing a square, rectangle, circle, or triangle around the object formation.

Chart paper/butcher paper
Shapes (circle, square, rectangle and triangle)
Drawing Utensils

Directions

Have students draw a city with trees on chart paper. Give students a shape and ask them to look at the picture they drew and to find things that match the shapes.

Variations

Have students draw a family portrait, their favorite animal or a character from a story that was just read to them. Use the shapes to match various shapes in the drawing.



Part 1 Review



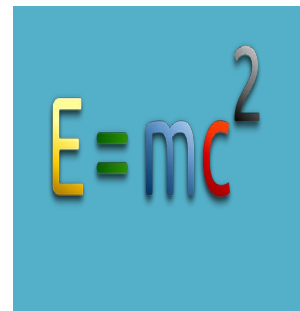
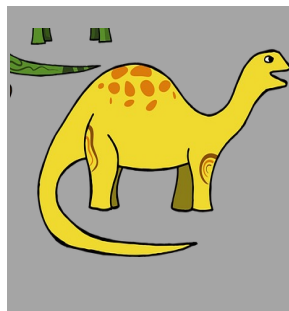
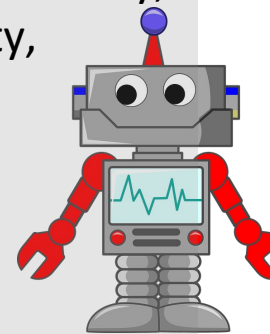
1. Preschool math helps students make sense of the world around them and teaches them to reason and problem-solve.

2. In preschool math, children learn about numbers by counting objects and discussing the results.

3. Children are learning geometry when they practice constructing shapes and discussing their properties.

4. When children sort objects by color, size, and shape, count them, and record the data on graphs and charts they are analyzing data.

5. Children have very positive attitudes toward mathematics and science during the preschool years, and opportunities to use mathematics and logical thinking to solve problems help children develop dispositions such as curiosity, imagination, flexibility, inventiveness, and persistence.



Part 2



Part 1:

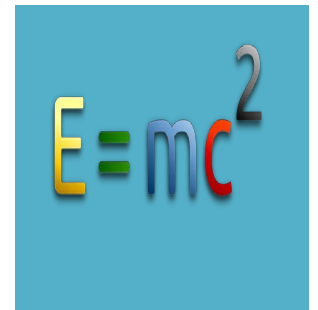
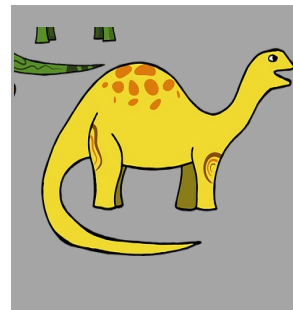
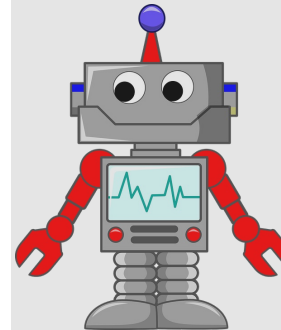
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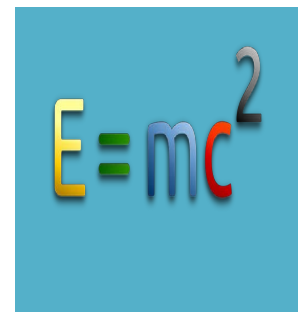
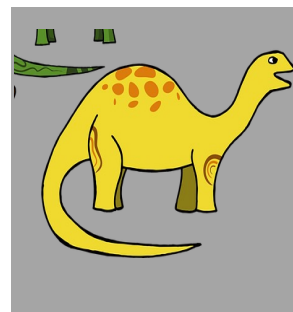
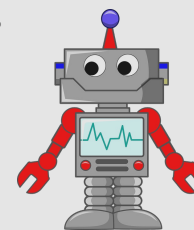
Scientific Reasoning and Inquiry



Current research shows that young children have the capacity for conceptual learning and the ability to use the skills of reasoning and inquiry as they investigate how the world works. For example, their play with blocks, water, and sand shares some science-relevant characteristics.

Young children can learn to organize and communicate what they learn and know the difference between concrete and abstract ideas.

Adults who engage children in science inquiry through the process of asking questions, investigating, and constructing explanations can provide developmentally appropriate environments that take advantage of what children do as part of their everyday life prior to entering formal school settings.



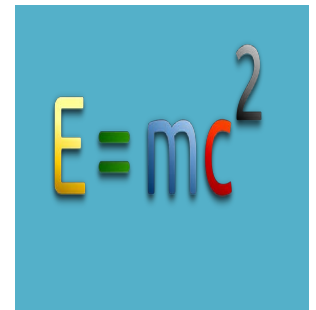
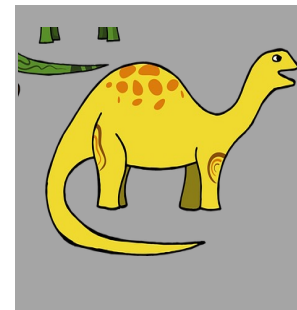
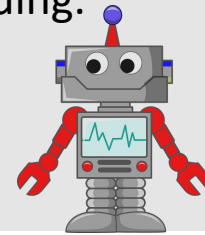
Adults Role in Children Learning Science



Adults play a central and important role in helping young children learn science

Everyday life is rich with science experiences, but these experiences can best contribute to science learning when an adult prepares the environment for science exploration, focuses children's observations, and provides time to talk about what was done and seen.

It is important that adults support children's play and direct their attention, structure their experiences, support their learning attempts. It's equally important for adults to look for signs from children and adjust the learning experiences to support their curiosity, learning, and understanding.



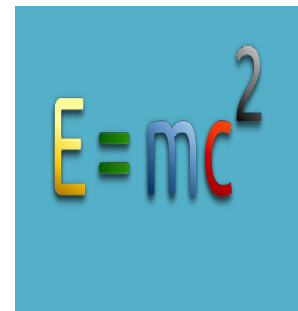
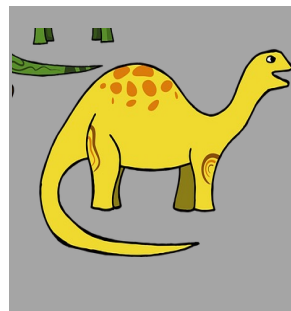
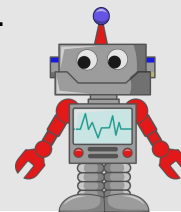
Science Exploration and Discovery



Young children need multiple and varied opportunities to engage in science exploration and discovery

Young children develop science understanding best when given multiple opportunities to engage in science exploration and experiences through inquiry and test their knowledge.

The range of experiences gives them the basis for seeing patterns, forming theories, considering alternate explanations, and building their knowledge. For example, engaging with natural environments in an outdoor learning center can provide opportunities for children to examine and duplicate the habitats of animals and insects, explore how things move, investigate the flow of water, recognize different textures that exist and make predictions about the world around them.





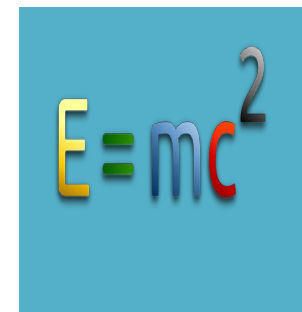
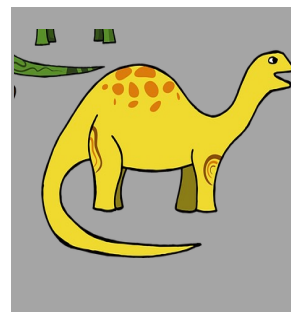
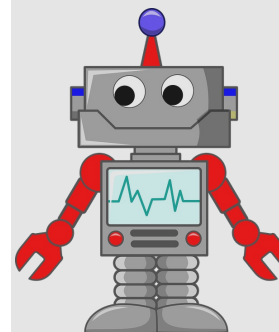
Science Skills and Knowledge



Young children develop science skills and knowledge in both formal and informal settings

Opportunities to explore, inquire, discover, and construct within the natural environment and with materials that are there need to be provided in formal education settings, such as preschool and early care and education programs through intentional lessons planned by knowledgeable adults.

Children also need to have opportunities to engage in science learning in informal settings, such as at home with cooking activities and outdoor play or in the community exploring and observing the environment.



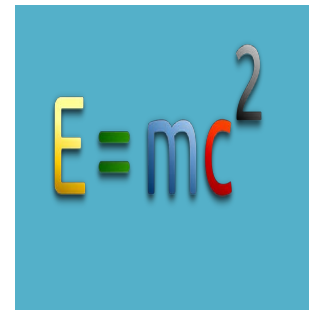
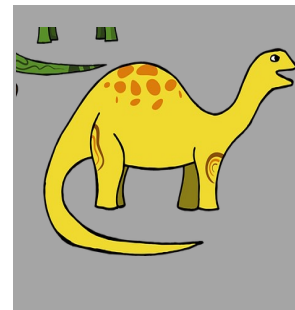
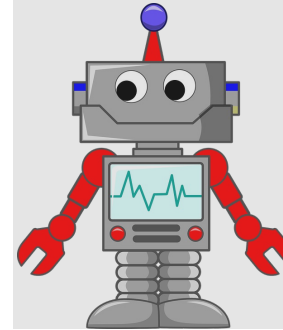
Scientific Practices



Young children develop science skills and knowledge over time

To effectively build science understanding, young children need opportunities for sustained engagement with materials and conversations that focus on the same set of ideas over weeks, months, and years.

For example, investigating the concept of light and shadows over several weeks indoors and out with a variety of materials and multiple activities will allow children to re-visit and re-engage over time, building on observations and predictions from day to day.





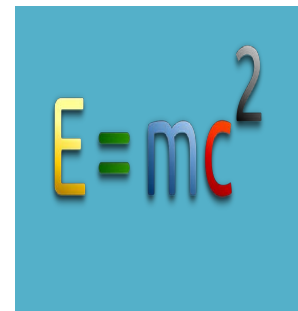
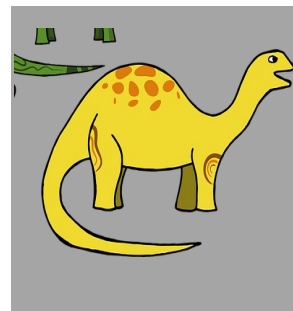
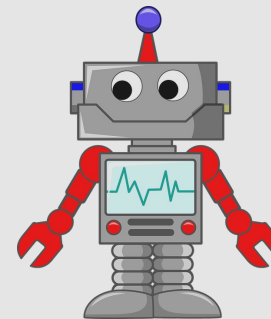
Experiential Learning



The activities allow children to question, explore, investigate, make meaning, and construct explanations and organize knowledge by manipulating materials.

Young children develop science skills and learning by engaging in experiential learning

Young children engage in science activities when an adult intentionally prepares the environment and the experiences to allow children to fully engage with materials.



Seven Basic Preschool Science Concepts

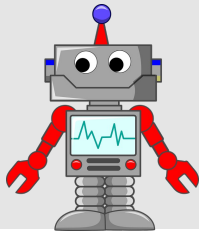


1) Observing

Children use their senses to observe.

2) Comparing

Once children have had time to explore items, they begin to compare.



3) Classifying

After observing and comparing, the children can take the information learned and begin sorting and grouping.

4) Measuring

Children can measure in many ways as they spend more time with items.

5) Communicating

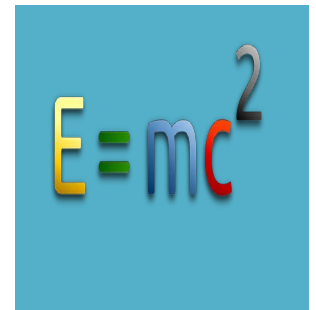
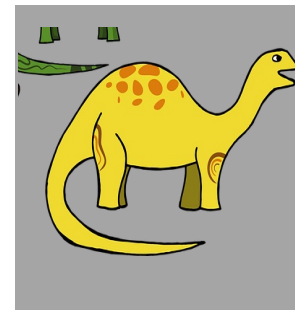
Communicating is a common process skill that many preschool children develop as they share their observations and findings.

6) Inferring

Building on prior knowledge.

7) Predicting

Predicting is when the child states what they expect will happen.

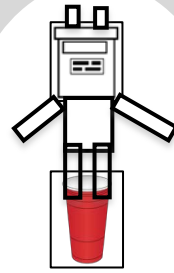


Science: "Loose Parts" Robot Activity

Directions

Building a "loose parts" robot allows students to work as a team, design, use critical thinking skills, and creativity. Students will use their language, math and measuring skills to determine how tall to build their robot.

Before students begin to build their robot, ask them to observe their materials and sketch a model of the robot they would like to build. As a team, have students build their robot according to their design. Provide rulers and measuring tape so students can measure the height and width of the robot.

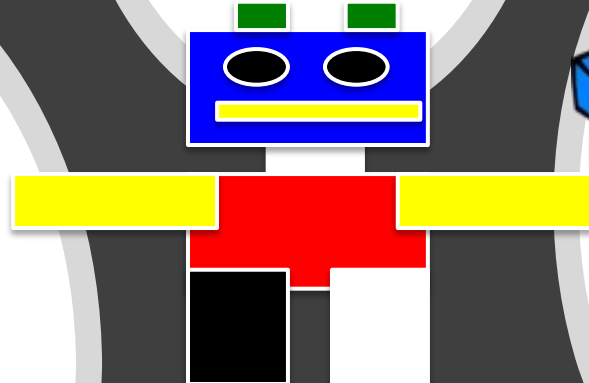
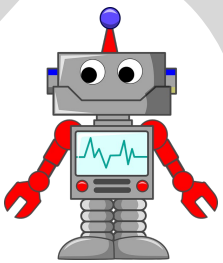


Objective

Students will engage in math and science skills as they engage in scientific inquiry by designing a robot using a variety of household items ("loose parts").

Materials

Variety of boxes (cereal boxes, mac and cheese boxes, etc.), Tape measure/Ruler, Journal

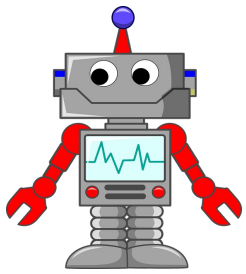


Loose Parts Materials

Variety of boxes (cereal boxes, mac and cheese boxes, etc.), Tape measure/Ruler, Journal

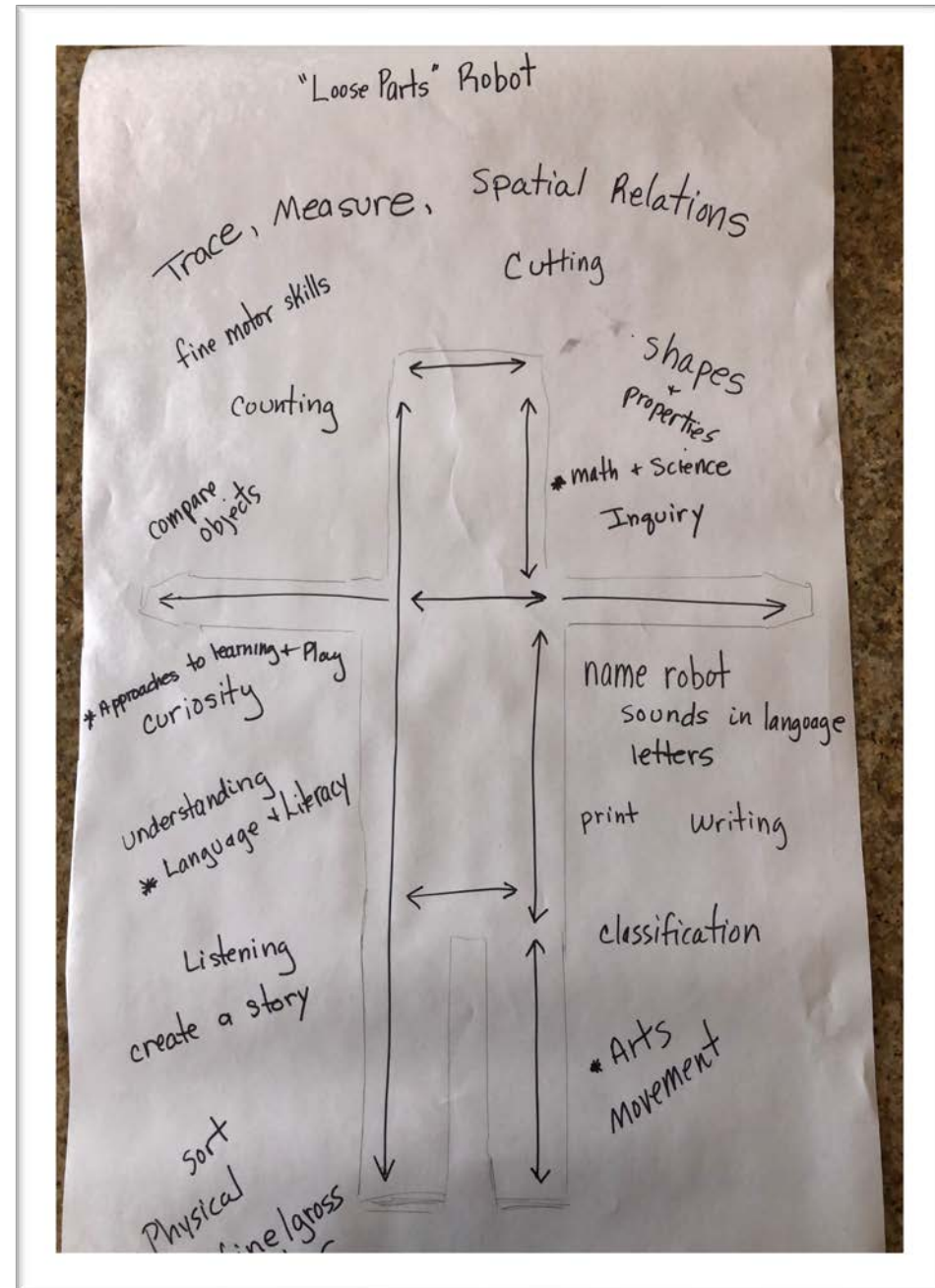


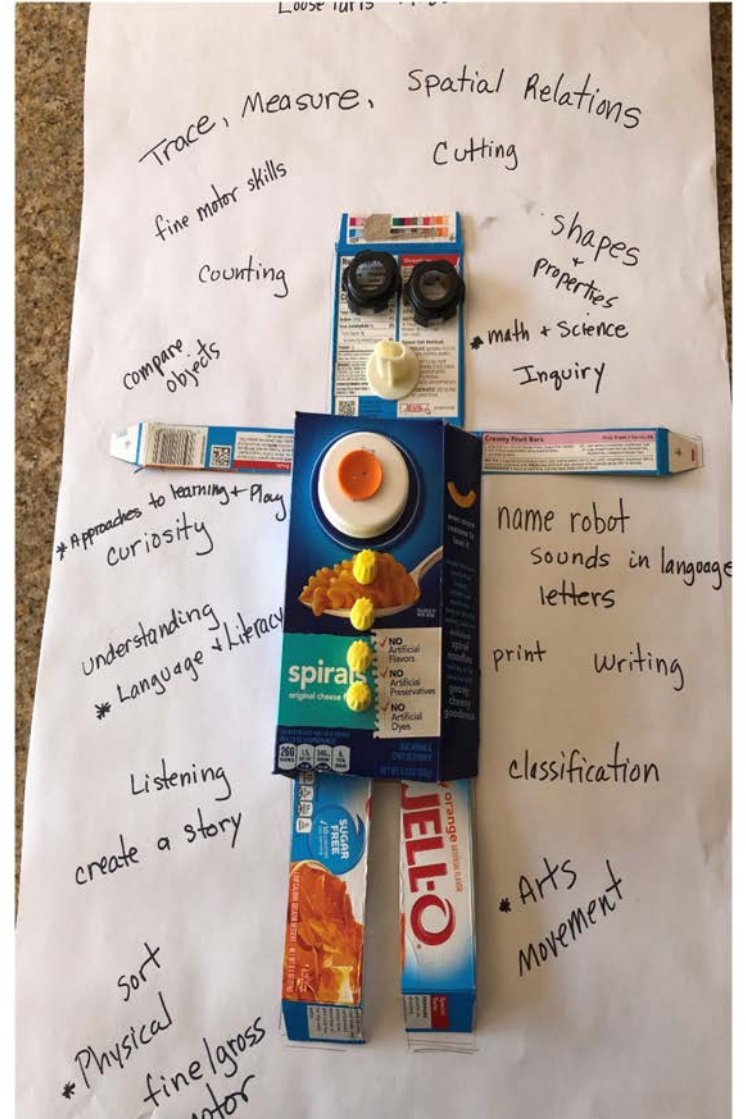
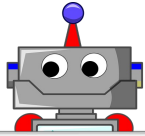




This is what you learn from
building a Loose Parts
Robot!

- ☒ Math & Science
- ☒ Spatial Relations
- ☒ Inquiry
- ☒ Shapes
- ☒ Language & Literacy
- ☒ The Arts
- ☒ Physical
- ☒ Fine Motor
- ☒ Classification
- ☒ Storytelling
- ☒ Measuring
- ☒ Engineering
- ☒ Sorting
- ☒ Curiosity

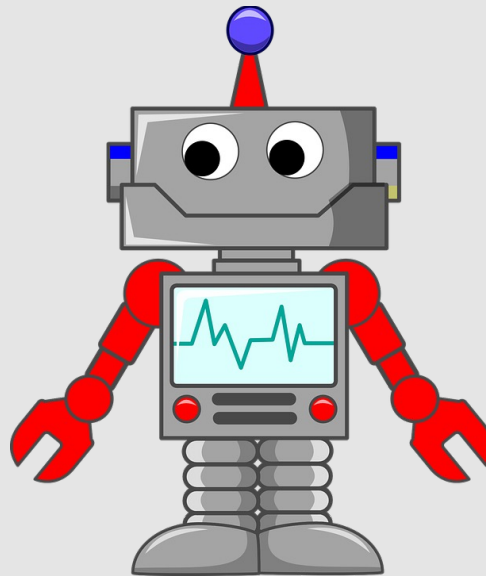
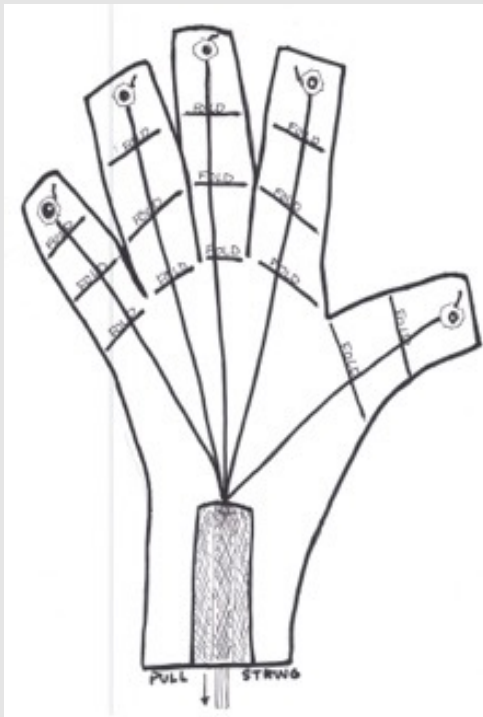




Science: Robotic Hand Activity

Objective:

Students will be able to design a robotic hands by integrating science, engineering, math and technology.



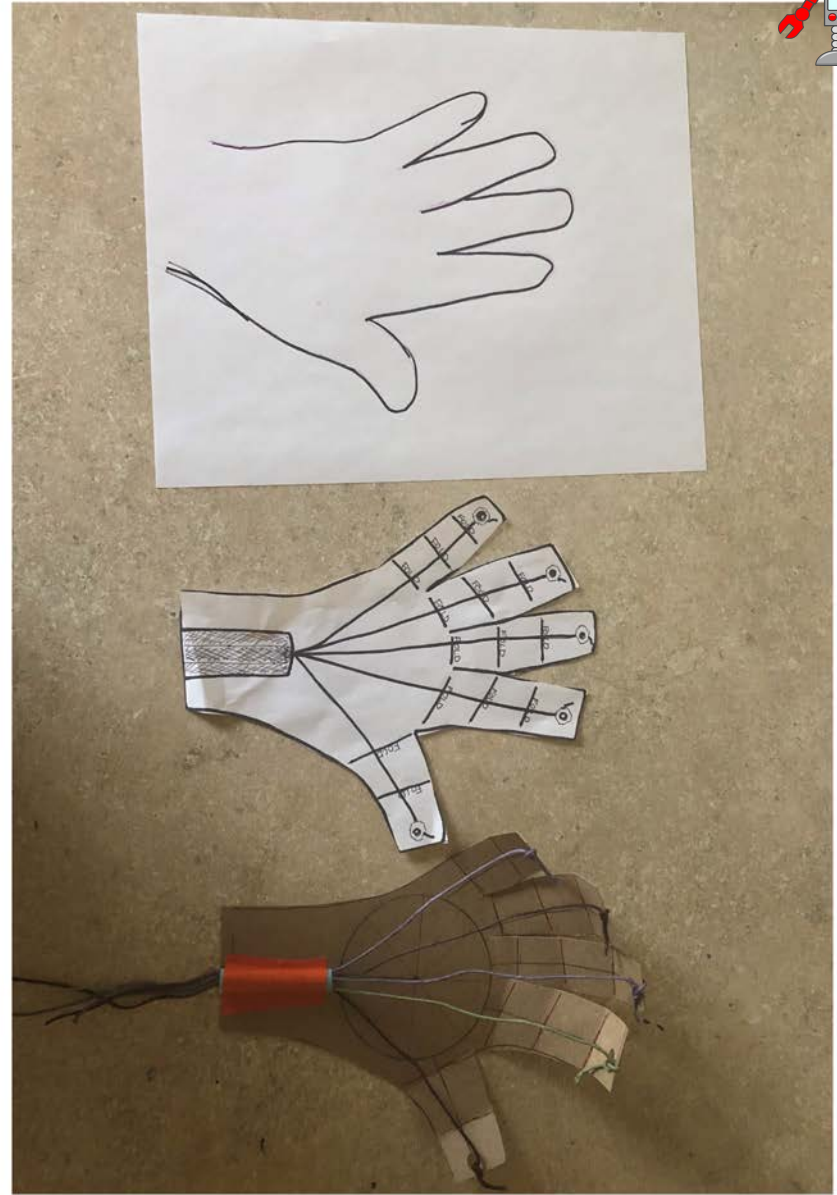
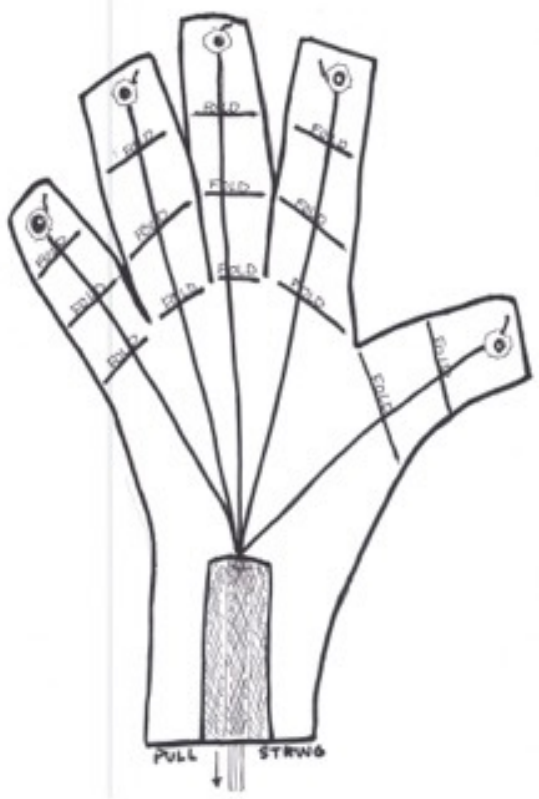
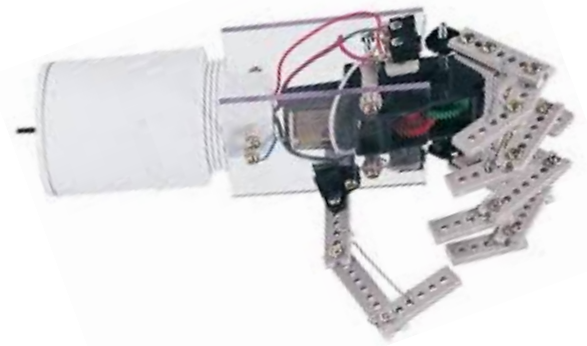
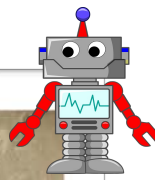
Materials

Paper or cardstock (Cereal box)
Wide straw, hole punch, string, tape

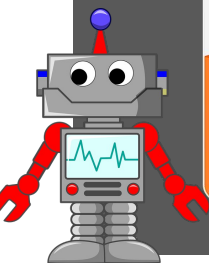
Directions

Have students trace their hand on paper or cardstock. They may need assistance. Cut out the traced hand. Hole punch the tip of each finger. Fold and crease the lines on the fingers. Tie the string at the end of each fingertip. After the string is tied to each hole punch, put the string through the straw. Tape the straw down to the cardboard just below the palm of the precut hand. Pull the string to make the robotic fingers move!

Helpful Hint: When cutting out the traced hand, cut the fingertips flat or square to replicate a robotic hand!



Part 2 Review



1. Young children also can learn to organize and communicate what they learn and know the difference between concrete and abstract ideas.

2. Young children need multiple and varied opportunities to engage in science exploration and discovery

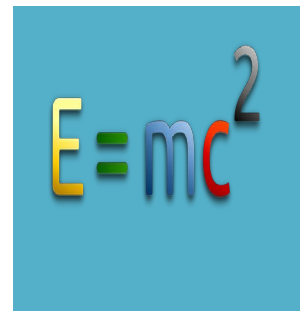
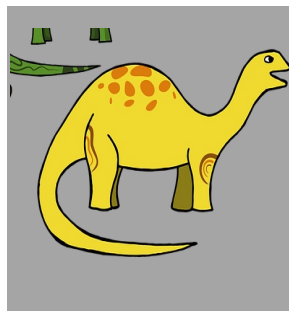
3. It is important when an adult prepares the environment for science exploration, focuses children's observations, and provides time to talk about what was done and seen.

4. Young children develop science skills and knowledge in both formal and informal settings

5. Young children develop science skills and knowledge over time.

6. Young children develop science skills and learning by engaging in experiential learning

7. There are seven Basic Preschool Science Concepts; 1) Observing, 2) Comparing, 3) Classifying, 4) Measuring, 5) Communicating, 6) Inferring, and 7) Predicting.



Part 3



Part 1:

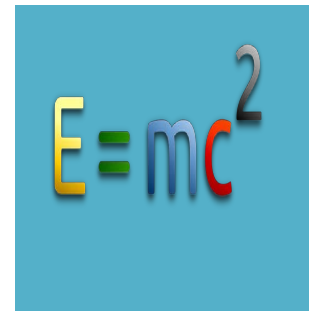
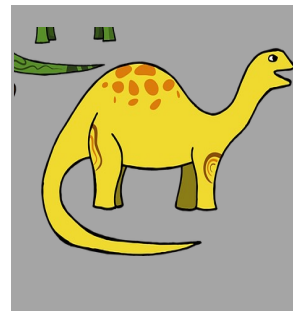
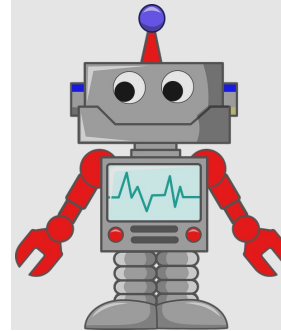
- Math in Everyday Play
- Math Activities
- Review

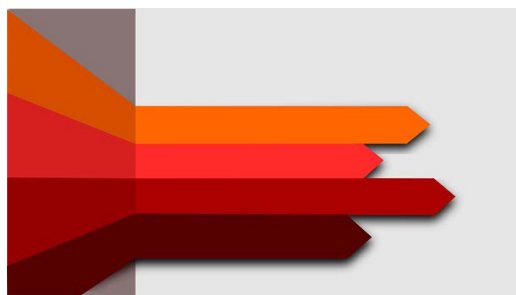
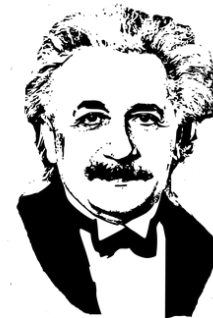
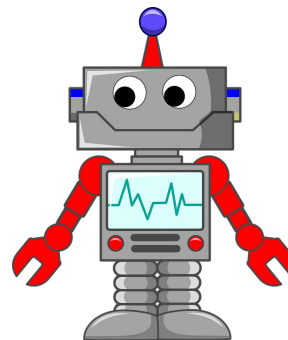
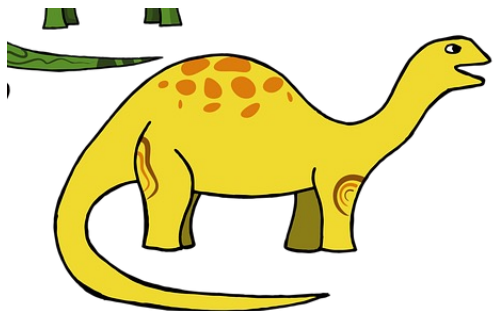
Part 2:

- Science Reasoning & Inquiry
- Science Activities
- Review

Part 3:

- Engaging Families
- Review
- References
- Transfer of Learning
- Evaluation

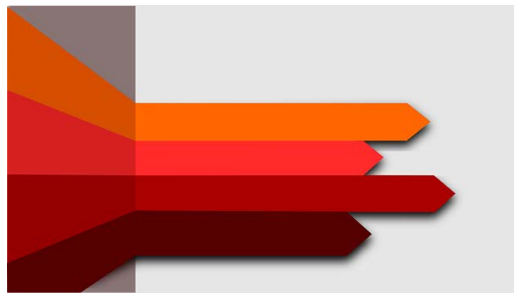
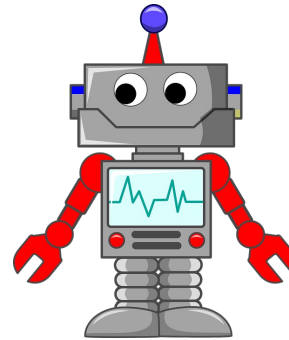
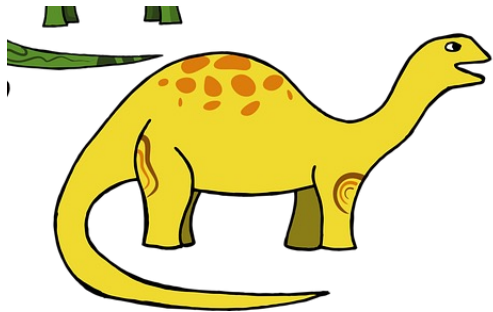




Engaging Families

Families matter for children's math development. When families are engaged in their children's math learning—for example, by telling entertaining math stories, playing digital media games, and doing hands-on mathematics activities at home—children's understanding of math concepts and math competencies increase.

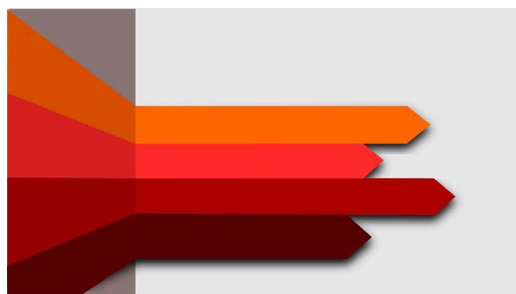
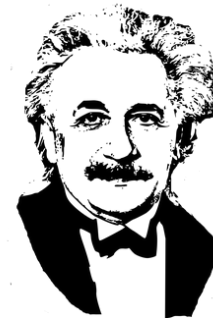
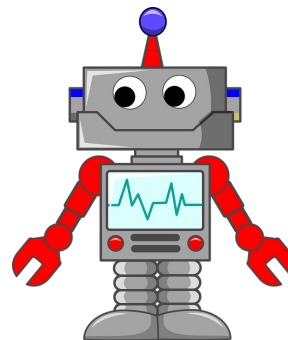
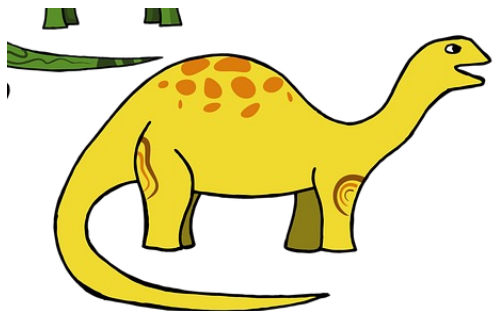
$$E = mc^2$$



Engaging Families

Mathematics and science learning starts in infancy and happens everywhere, all the time. For this reason, families are critical to supporting math learning, and research from this series shows that families can do it in unpressured and socially positive ways. For example, reading all kinds of books with math content that is either implicit or explicit can lead to enjoyable parent–child conversations.

$$E = mc^2$$



Engaging Families

Families and educators must share responsibility for supporting early math development. Families need guidance and ideas for how to support early math development. Educators in a variety of settings (such as teachers, home-based providers, and librarians) can provide families with tips and ideas to encourage math learning. Similarly, educators need to understand the cultural nature of mathematics and science exploration, and incorporate family and community practices into their teaching practice.

$$E = mc^2$$

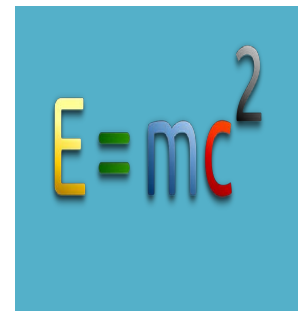
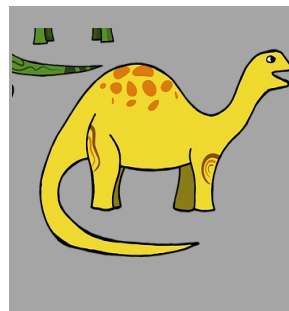
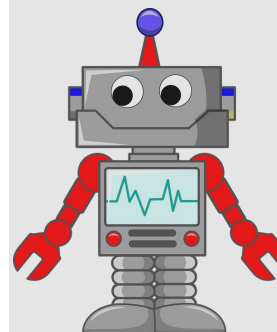
Part 3 Review

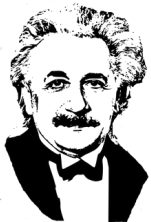


1. When families are engaged in their children's math and science exploration learning children's understanding of math concepts and math competencies increase

2. Families are critical to supporting math and science exploration learning and can lead to enjoyable parent-child conversations.

3. Educators need to understand the cultural nature of mathematics and science exploration and incorporate family and community practices into their teaching practice.





References

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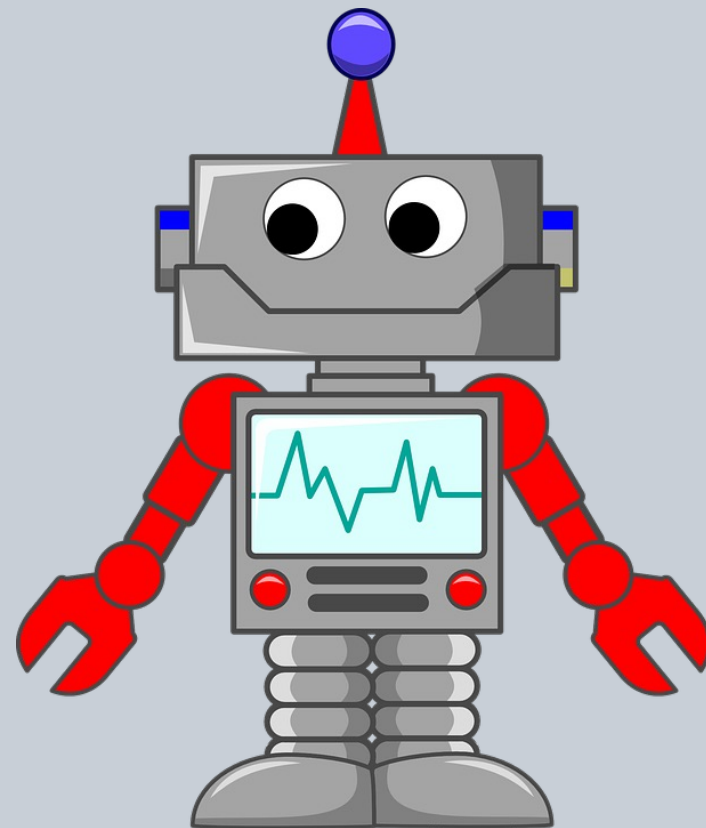
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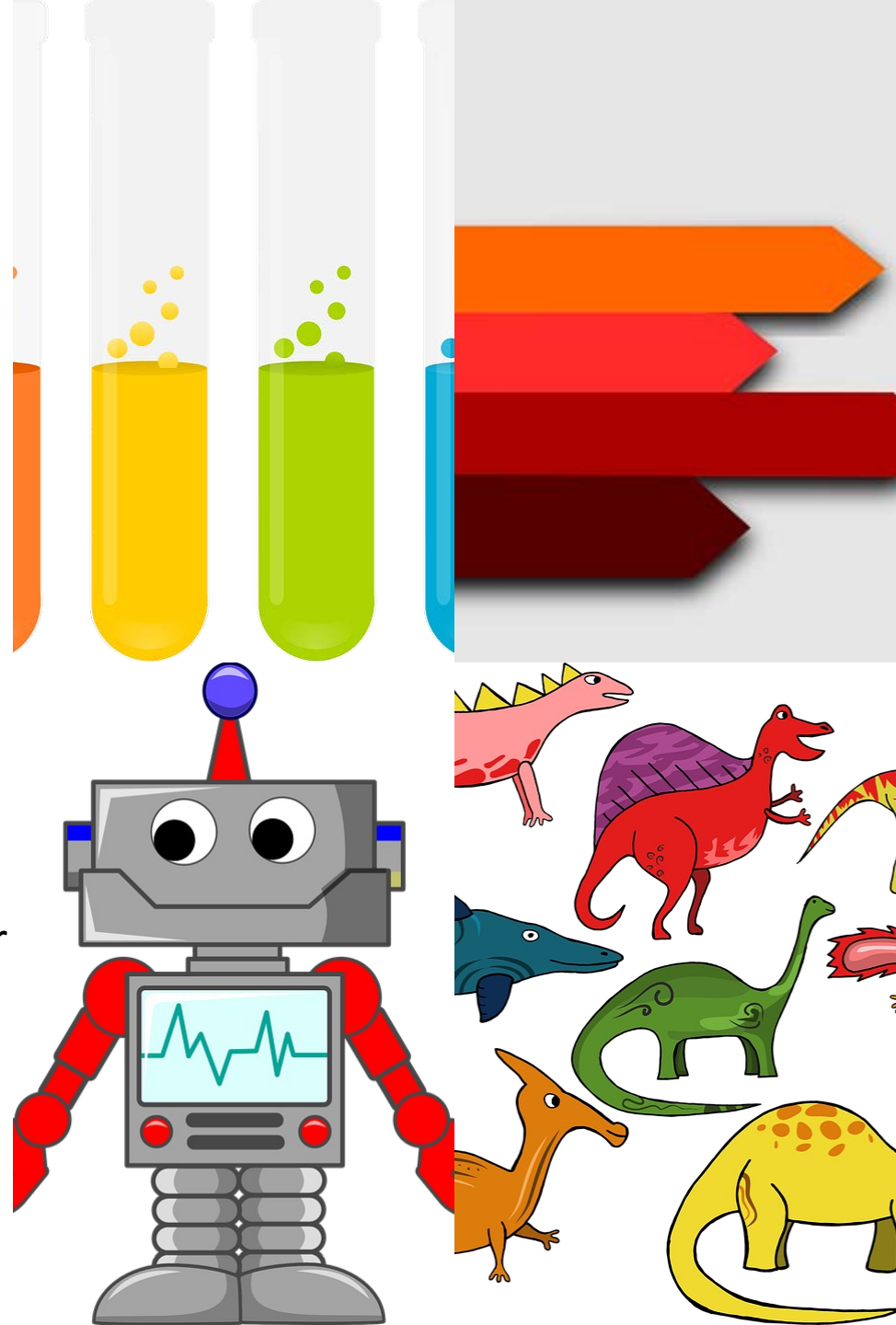
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Transfer of Learning

How will you transfer learning into your work environment?

- Think about strategies or activities that you found of interests.
- How will you use them in the classroom?
- How will you differentiate activities to meet students' needs?
- If you were observed in the classroom, would your supervisor see the connection between the training content and your interactions with students?





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