The STEAM Plays Curriculum

Introductory exercises—before the show:
STEAM versus STEM

For the instructor:
Read the articles on the ABOUT page of this website regarding the debate between STEM and STEAM
https://theconversation.com/i-wrote-a-play-for-children-about-integrating-the-arts-into-stem-fields-heres-what-i-learned-about-encouraging-creative-interdisciplinary-thinking-218001

Take a look at this article that gives a bit more background about why integrating the arts into STEM makes sense: https://blog.definedlearning.com/blog/stem-steam-whats-difference

You should have gained clarity related to the addition of the arts into a science, technology, engineering, and mathematics curriculum that leads to creative and bigger-picture thinking beyond simply data collection. The arts inspire and infuse the STEM categories with imagination and experimentation.

For the students:
Introduce them to the STEM categories
Create classroom shared definition of:
Science
Technology
Engineering
Mathematics

DEFINE EACH CATEGORY OF STEM
Ask them to define science. Ask for a variety of words when they hear science and try to create a definition from those words. Once you have a definition of the basic word science, go deeper.

SEE WHERE STEM impacts their real life
How do they use science in real life? Taking medicine, taking their dog to the vet. Do this for all of the STEM letters.

CAREERS

See where students are at both defining the umbrella term ("engineering," for example) and see if they can name categories, jobs, toys, or other things related to the larger letter front the STEM acronym.

For older students, share this interactive periodic table of STEM careers from the US Bureau of Labor Statistics.
https://www.bls.gov/k12/students/careers/stem-table.htm

or use the pdf version
https://www.bls.gov/k12/teachers/posters/pdf/periodic-table.pdf

Adding the A to STEM

Ask your students how the ARTS could become part of STEM?
How can something as different as science and the arts go together?
See if students have any connection to how the addition of the ARTS to STEM can create a difference.

It is certainly a major ask for younger students, but hopefully, after the show, they will be able to answer this question with more skill drawing connections between how the arts interact with STEM.

Educator note: Please be aware some of these exercises were created using AI, as we did with many of the designs. We believe in and used technology to create and inspire the artistic imagination.

AFTER SEEING THE SHOW:

STAGE MANAGER SPEECH:
At the top of the show the Stage manager talked about using STEAM to make the show run smoothly. Can you think of what that character said about STEAM?

1) Science– to follow health and safety guidelines
2) Technology to run the sound and video
3) Engineering to connect the technology to run to the speakers and screen
4) Math to keep the show running on time
5) Arts– they said most of the arts would be used throughout like dance, music, writing, and more

WHAT WILL YOU MAKE

The first song asked the question, "What Will You Make?"
Take a piece of paper and try to draw something that you would like in your life that doesn't yet exist. Invent something that you would use and would make your life more fun, better, or just plain different. Draw that onto the paper. Now pair up with a partner and explain your new invention.

Note to the educator: This activity can be proof that art is necessary to bring an idea to life. By drawing their new invention, they have conceptualized an idea. In your discussion and coaching as they are creating, see if their invention falls under any of the STEAM categories. The ultimate takeaway is the artistic vision needed to create something new.

THE SCIENCE PLAYS

Lesson Plan: "Curiosity Quest"

Objective:

To cultivate curiosity and critical thinking skills in younger elementary students by engaging in a simplified version of "The Why? Game."

Grade Level: Younger Elementary (1st to 3rd grade)

Duration: 45 minutes

Materials Needed:

Large drawing paper or whiteboard
Colorful markers or chalk
Pairing cards (optional)
Certificates for participants

Introduction (10 minutes):

Welcome and Introduction (5 minutes):

- Begin by welcoming students to the "Curiosity Quest." Explain that today's activity is all about asking questions and exploring "why."

Curiosity Talk (5 minutes):

- Discuss the concept of curiosity in simple terms. Emphasize that asking "why" helps us learn more about the world around us.

Curiosity Quest Activity (25 minutes):

Pairing Up (5 minutes):

- Have students pair up with a partner. If needed, use pairing cards to match students. Designate one as the "Curiosity Explorer" and the other as the "Curiosity Guide."

Curiosity Exploration (15 minutes):

- The Curiosity Explorer makes a simple statement (e.g., "I like ice cream"). The Curiosity Guide responds with "Why?" The explorer continues to answer each "Why?" question until they reach a simple conclusion.

Drawing Exploration (5 minutes):

- Provide large drawing paper or use a whiteboard. Ask each pair to draw a picture that represents the conclusion of their "Curiosity Quest." Encourage creativity.

Reflection and Discussion (5 minutes):

Sharing Discoveries (3 minutes):

- Invite a few pairs to share their drawings and discoveries with the class. Emphasize the diversity of answers that can come from asking "why."

Group Reflection (2 minutes):

- Facilitate a brief discussion on what students enjoyed about the activity. Ask if they found any surprising answers during their Curiosity Quest.

Conclusion and Certificates (5 minutes):

Certificates and Appreciation (5 minutes):

- Award each student a "Curiosity Explorer Certificate" for actively participating in the "Curiosity Quest." Express appreciation for their curiosity and willingness to explore.

Take-Home Activity (Optional):

- Encourage students to ask "why" at home during the week. Parents or guardians can join in the exploration, fostering a curiosity-driven environment.

This lesson plan provides a playful and age-appropriate approach to cultivating curiosity and critical thinking skills in younger elementary students through the "Curiosity Quest" activity.

Exercise: Marie Curie and Women in Science

Give a basic overview of Marie Curie
Here is a video for Kids:
https://www.youtube.com/watch?v=yqY-R3CBLYs
Created by: Hey! Guess What who holds the rights and license for the video.
Why was Marie so amazing? True and False Quiz

Marie Curie was the first woman to win a Nobel Prize.
Women were not allowed to attend universities when Marie Curie was studying.
Marie Curie discovered radium and polonium.
Women have always been encouraged to pursue careers in science.
Marie Curie won Nobel Prizes in both Physics and Chemistry.
Women scientists face no challenges or discrimination in their careers.
Marie Curie's daughter, Irène Joliot-Curie, also won a Nobel Prize in Chemistry.
It is important for everyone to support and encourage girls who are interested in science.

Quiz Key:

True - Marie Curie was the first woman to win a Nobel Prize.
False - Marie Curie did face challenges, but women were not completely banned from universities during her time.
True - Marie Curie discovered radium and polonium.
False - Unfortunately, women have historically faced obstacles in pursuing careers in science.
True - Marie Curie won Nobel Prizes in both Physics and Chemistry.
False - Women scientists may face challenges and discrimination in their careers.
True - Marie Curie's daughter, Irène Joliot-Curie, also won a Nobel Prize in Chemistry.
True - It is important for everyone to support and encourage girls who are interested in science.

Discussion: Why do you think women have had a hard time historically in science careers?

Activity:

Activity: "Scientist Spotlight"

Objective:

To learn about and celebrate the contributions of women in science.

Materials Needed:

- Large poster paper or cardboard
- Markers, crayons, and colored pencils
- Pictures or printouts of various women scientists
- Glue
- Scissors
- Information sheets about each scientist (optional)

Instructions:

Introduction (10 minutes):

Start by discussing the importance of science and the various fields where scientists work. Briefly talk about some well-known male and female scientists.

Research (15 minutes):

Divide the students into small groups. Provide each group with pictures or printouts of different women scientists. Ask them to research and gather information about their assigned scientist's contributions, discoveries, and achievements.

Create a Scientist Spotlight Poster (30 minutes):

Give each group a large piece of poster paper or cardboard. Instruct them to create a "Scientist Spotlight" poster for their assigned scientist. They can use markers, crayons, colored pencils, and pictures to make the poster visually appealing.

Presentation (15 minutes):

After the posters are complete, have each group present their "Scientist Spotlight" to the class. Encourage students to share interesting facts about the scientist and explain why her contributions are significant.

Discussion (10 minutes):

Facilitate a class discussion about the importance of diversity in science. Discuss how everyone, regardless of gender, can pursue a career in science. Emphasize the idea that anyone can make meaningful contributions to the scientific community.

Display the Posters (Ongoing):

Hang the "Scientist Spotlight" posters around the classroom or in a common area of the school to showcase the achievements of women in science.

This activity not only promotes awareness of women in science but also encourages teamwork and creativity among elementary students.

The Why Song?

Marie asks several questions before and during the song, “Why?”

Does anyone know the answer?

Why do birds fly?

Why does it snow?

Why is the sky blue?

DO THE TREES TURN YELLOW IN THE FALL?

DO THEY EVEN CHANGE THEIR SHADE AT ALL?

DO THEY GROW SO MUCH TALLER THAN ME?

Pick one of these questions and draw a picture of the bird flying or the trees leaves. See if there is some way to put what you think happens in that picture for example: Do the clouds store up snow for winter? What do they do in the summer? Try to show your reasoning through your drawing.

Mixing it Up with Marie

Activity: "Baking Chemistry Lab"

Objective:

To explore the chemical reactions that occur during baking and understand the scientific principles behind it.

Materials Needed:

- Sugar
- Flour
- Baking powder
- Baking soda
- Butter
- Mixing bowls
- Measuring cups and spoons
- Cookie cutters
- Oven (for supervision by adults)

Instructions:

Introduction (10 minutes):

Start by discussing with the students what baking is and why certain ingredients are needed. Introduce key baking ingredients such as flour, sugar, baking powder, baking soda, and butter.

Ingredient Exploration (15 minutes):

Allow students to explore each ingredient. Have them smell and touch the ingredients while discussing their properties. Explain the role of each ingredient in baking.

Mixing and Observations (20 minutes):

Divide the students into small groups. Provide each group with measured amounts of sugar, flour, baking powder, and baking soda. Instruct them to mix these ingredients in different combinations in their bowls.
Ask the students to observe and describe any changes they see during the mixing process. Discuss how ingredients react with each other and why mixing is an essential step in baking.

Cookie Dough Creation (15 minutes):

Guide the students in making cookie dough by adding butter to their mixtures. Discuss how butter helps bind the ingredients together and contributes to the flavor and texture of the final product.

Cookie Cutting (10 minutes):

Have fun with the process by allowing students to use cookie cutters to shape their cookie dough. Discuss how the shapes will hold during baking due to the chemical changes happening in the dough.

Baking (Supervised by Adults):

Preheat the oven and let the students place their shaped cookie dough on a baking sheet. While the cookies are baking, discuss the concept of heat causing chemical reactions and transforming the dough into cookies.

Tasting and Conclusion (10 minutes):

Once the cookies are baked and cooled, allow the students to taste the delicious results. Discuss how the ingredients transformed during baking and how chemical reactions played a crucial role in the process.

This hands-on activity not only makes learning about chemistry engaging but also provides a tasty treat at the end!

If this seems too much for your students, facilitate a conversation

Activity: "Imaginary Chef - Create Your Fantasy Recipe"

Objective:

To spark creativity and imagination, introducing elementary students to the concept of recipe creation using pretend ingredients.

Materials Needed:

Paper and colored pencils/markers for each student
Imaginary ingredients cards (created beforehand)
Imaginary kitchen tools (optional)
Chef hats or aprons for added fun

Instructions:

Introduction (10 minutes):

Begin by discussing the idea of imaginary cooking. Explain that today, each student will become an Imaginary Chef and create a fantasy recipe using pretend ingredients.

Favorite Fantasy Ingredients (15 minutes):

Instead of real foods, have students think of their favorite imaginary or fantasy ingredients. Encourage them to be as creative as possible – think about unicorn sprinkles, dragon fruit, or fairy dust.

Recipe Planning (20 minutes):

Provide each student with imaginary ingredient cards or let them create their own. Instruct them to plan their fantasy recipe by selecting and arranging these pretend ingredients. Ask questions like:

- What will be the main imaginary ingredient?
- How will the flavors of these imaginary ingredients combine?
- Can you come up with a creative name for your dish?

Encourage creativity and playfulness.

Imaginary Creation (30 minutes):

Allow students to use their imagination to create their fantasy recipes. They can draw or write about the pretend cooking process, using imaginary kitchen tools if desired.

Culinary Imagination Check (10 minutes):

Engage with each student to discuss their imaginary recipes. Ask questions like:

- What inspired your choice of imaginary ingredients?
- How do you think the flavors of these imaginary ingredients will interact?
- Are there any special techniques or steps in your imaginary cooking process?

This step emphasizes the imaginative aspect of culinary creation.

Sharing and Imaginary Tasting (15 minutes):

Have students share their fantasy recipes with the class. Encourage them to describe the imaginary flavors and unique aspects of their dishes. Consider a "tasting" session where students pretend to taste each other's creations.

Chef's Certificates (5 minutes):

Conclude the activity by awarding each student an "Imaginary Chef Certificate" for their creativity and imaginative culinary skills. Celebrate their fantastical recipes and highlight the playful connection between imagination and cooking.

This imaginative twist on the activity not only sparks creativity but also introduces the idea that cooking is not limited to real ingredients, encouraging students to think outside the box.

EVIL GENIUS PART 1:

Activity: "Imagine & Share" - Discovering Similarities Between Actors and Scientists

Objective:

To introduce elementary students to the similarities between actors and scientists through a simplified creative activity.

Materials Needed:

Paper and pencils for each student
Markers, crayons, and colored pencils

Instructions:

Introduction (5 minutes):

Begin by briefly discussing what actors and scientists do. Explain that both groups engage in similar processes such as researching, practicing/rehearsing, and sharing their work with others.

Imagine a Scene or Experiment (15 minutes):

Provide each student with a piece of paper and ask them to imagine a short scene for actors or a simple experiment for scientists. This can be a fun, imaginary scenario. Encourage creativity!

Draw or Write (20 minutes):

Instruct students to either draw a scene (for actors) or write about a simple experiment (for scientists). Emphasize the importance of creativity in expressing their ideas.

Rehearse or Experiment (15 minutes):

Give students a few minutes to "rehearse" their scenes (for actors) or "conduct" their experiments (for scientists). This can be a playful, imaginative activity.

Share with Peers (15 minutes):

> Allow students to share their drawings or writings with their classmates. Each student can briefly explain their imagined scene or experiment to the group.

Discussion (10 minutes):

> Lead a short discussion about the shared similarities between actors and scientists. Highlight the common elements of research, practice, and presenting ideas to others.

Display and Appreciate (10 minutes):

> Have students display their drawings or writings in a designated area of the classroom. Encourage their peers to appreciate and ask questions about each other's creative work.

This simplified exercise introduces the basic concepts of research, rehearsal, and sharing in a fun and imaginative way, making it accessible for elementary students.

ANATOMY OF A DANCE
Activity: "Dance Exploration"

Objective:

To have fun learning a simple dance and understanding basic body movements.

Materials Needed:

Device with internet access
Open space for dancing

Instructions:

Introduction (5 minutes):

Explain to the students that they will be learning a simple dance and discovering how understanding basic body movements is important for dancing.

Selecting a Dance (5 minutes):

Choose a short and fun dance video suitable for elementary students. Make sure it's something easy for them to follow.

Learn the Dance (15 minutes):

Watch the selected dance video together. Encourage students to follow along and mimic the movements. Repeat the video a few times to practice.

Dance Together (10 minutes):

Have the students dance together as a group, following the steps they learned. Encourage them to enjoy the movement and express themselves.

Reflection (5 minutes):

Ask simple questions like:

- Which part of your body did you use the most?
- How did understanding the dance movements help you dance better?

Dance Showcase (10 minutes):

- Allow each student to showcase their favorite dance move to the group. Celebrate their efforts and enthusiasm.

This simplified is designed for a quick and enjoyable exploration of dance and basic body movements.

FOLLOW UP ON THE SCIENCE PLAYS

To the educator: Facilitate a discussion regarding how the arts and science integrate. Either how chemistry and the culinary arts are so similar with recipes and outcomes or how dance and anatomy are connected. The big takeaway is science is about asking why– just like artists when they create either as an actor, dancer, or baker.

THE TECHNOLOGY PLAYS

TREY the TECHNOLOGIST. In the song “Tech” Trey did an audience chant along about the many ways tech impacts your lives, like computers, plumbing, and more.

Activity: "Tech-a-thon Creators"

Objective:

To encourage creativity and expression, allowing students to come up with their own technology-themed chants.

Materials Needed:

Imaginary microphones or tech gadgets (optional)
Paper and pencils for each student

Instructions:

Introduction (5 minutes):

Begin by explaining to the students that they will become creators of their own technology-themed chants. Emphasize that they can be as imaginative and fun as they want.

Brainstorming (10 minutes):

Have a short brainstorming session. Ask students to think about different aspects of technology and how it impacts their lives. Encourage them to jot down words or phrases related to technology.

Creating Chants (20 minutes):

Distribute paper and pencils to each student. Instruct them to create their own chants. They can use the template "TECH!" and add their imaginative lines. For example:

- "TECH! We turn on lights with just a touch!"
- "TECH! Phones that capture moments, oh so much!"
- "TECH! A world of knowledge with a click and such!"

Practice and Refinement (15 minutes):

Allow students to practice their chants individually or in small groups. Encourage them to refine their lines and add playful gestures or movements to accompany their chants.

Chant Showcase (15 minutes):

Invite each student or group to showcase their original chants to the class. Encourage creativity and celebrate each unique expression. Provide positive feedback and applause.

Discussion (5 minutes):

After each presentation, have a short discussion:

- Ask students to share what inspired their chants.
- Discuss the diverse ways technology impacts their lives.

Tech-a-thon Finale (5 minutes):

Gather the class for a collective cheer: "GO TECH!" Encourage students to express their enthusiasm for the creative chants and technology in general.

This activity empowers students to be creators, fostering creativity, and allowing them to express their thoughts and feelings about technology through fun and original chants.

Activity: "Marvelous CGI Creators"

Objective:

To help elementary students understand the combination of technology and art in Marvel movies through CGI by allowing them to create their own imaginative worlds.

Materials Needed:

- Paper and colored pencils/markers
- Craft supplies (optional)
- Small cardboard boxes (optional)
- Imaginary play props (optional)

Instructions:

Introduction (10 minutes):

Start by discussing what CGI is and how it is used in Marvel movies to create fantastical worlds. Explain that CGI involves using technology and artistic skills to bring imaginary places and characters to life.

Marvel World Brainstorm (15 minutes):

Have a brainstorming session where students share their favorite Marvel movie worlds or characters. Discuss how CGI helps in making these worlds look realistic and exciting.

Create Imaginary Worlds (30 minutes):

Instruct students to create their own imaginary worlds on paper. Encourage them to draw scenes, characters, or entire worlds inspired by the Marvel movies. Provide craft supplies for those who want to add a three-dimensional touch.

Explain Your Marvel World (10 minutes):

After creating their worlds, ask students to explain their designs to the class. What makes their world special? How did they use technology (imagination and art skills) to create it?

Bring the Worlds to Life (20 minutes):

> For a more interactive experience, provide small cardboard boxes and encourage students to turn their drawings into dioramas or mini sets. They can use imaginary play props to act out scenes from their Marvel-inspired worlds.

Marvel Movie Showcase (15 minutes):

> Arrange a mini "Marvel Movie Showcase" where each student presents their imaginary world to the class. They can discuss the technology and artistic elements they incorporated into their creation.

Discussion (10 minutes):

> Lead a discussion about how technology and art come together in Marvel movies through CGI. Ask students about the challenges and excitement of creating their own imaginary worlds.

Marvelous CGI Creators Certificates (5 minutes):

> Conclude the activity by awarding each student a "Marvelous CGI Creators Certificate" for their imaginative efforts. Celebrate their creativity in blending technology and art.

This activity not only introduces the concept of CGI in Marvel movies but also allows students to be creators of their own Marvel-inspired worlds, emphasizing the blend of technology and art in the filmmaking process.

Activity: "Magic of Tech"

Objective:

To simplify and highlight the magical aspects of technology by drawing parallels with familiar magical concepts.

Materials Needed:

- Paper and pencils for each student
- Craft supplies (optional)

Instructions:

Introduction (5 minutes):

Start by discussing with students the idea that technology can sometimes seem like magic because it can do amazing things. Explain that just like magic, technology has its own set of tricks and wonders.

Magic and Tech Brainstorm (10 minutes):

Have a short brainstorming session where students list things they associate with magic (wands, spells, potions) and things related to technology (phones, computers, robots). Discuss how both involve making things happen.

Magic Wand Drawing (15 minutes):

Instruct students to draw their own "Magic Tech Wand." Encourage them to be creative in designing a wand that represents technology. They can include buttons, screens, or any features they associate with futuristic tech.

Tech Spells (20 minutes):

Have students come up with "Tech Spells" – simple commands or actions they'd like their Magic Tech Wand to perform. For example, "Turn on the lights" or "Send a message." This activity helps them connect the idea of giving commands in technology to casting spells in magic.

Craft Your Magic Tech Wand (15 minutes):

> Optionally, provide craft supplies for students to bring their Magic Tech Wand to life. They can add colors, buttons, and decorations to enhance the magical and tech-inspired elements of their creation.

Magic Tech Wand Showcase (10 minutes):

> Allow each student to showcase their Magic Tech Wand to the class. They can demonstrate their "Tech Spells" and explain how their magical creation relates to technology.

Discussion (10 minutes):

> Lead a discussion about how the Magic Tech Wand activity relates to technology. Discuss the idea that, like magic, technology allows us to make things happen with a simple command or action.

Magical Tech Explorers Certificates (5 minutes):

> Conclude the activity by awarding each student a "Magical Tech Explorers Certificate" for embracing the magical side of technology. Celebrate their creativity and understanding of the connection between magic and tech.

This activity emphasizes the magical aspects of technology, making the connection clear and engaging for elementary students.

Activity: "Creative Explorers Quest"

Objective:

To have fun while exploring the creativity shared by writers and technologists.

Materials Needed:

Paper and colored markers for each student
Craft supplies (optional)
Story prompts or creative writing prompts
Building blocks or playdough (optional)

Instructions:

Introduction (5 minutes):

Begin with a lively discussion about stories and cool inventions. Ask students if they like making up stories or if they enjoy playing with new gadgets.

Creative Writing Quick Game (10 minutes):

Jump into a quick and fun creative writing game. Provide story prompts or creative writing prompts and ask students to come up with the craziest, most exciting stories they can think of in a short time.

Creative Tech Creations (15 minutes):

Now, let's bring those stories to life! Hand out craft supplies, playdough, or building blocks. Ask students to create a character or scene from their stories using these materials. The wilder, the better!

Show and Play (10 minutes):

Give each student a chance to show off their creation and share a bit of their story with the class. Encourage them to get imaginative and use expressive words to describe their characters or scenes.

Discussion (5 minutes):

Engage in a brief, light-hearted discussion about how writing stories and creating things with craft supplies are similar. Ask questions like:

- Did you have fun making up stories?
- How was creating something with craft supplies like bringing your story to life?

Creative Explorers Awards (5 minutes):

Conclude the activity by celebrating each student's creativity and giving out "Creative Explorers Awards" for their fantastic stories and imaginative creations.

This fun activity focuses on the joy of creativity, making the connection between writing and technology an exciting adventure for elementary students.

Activity: "Rainy Day Tech Fun"

Objective:

To have fun exploring how technology can entertain on a rainy day.

Materials Needed:

- Paper and colored markers
- Craft supplies (optional)
- Devices with internet access (if available)
- Blankets or cushions for a cozy indoor setup

Instructions:

Tech Carnival Plans (10 minutes):

Ask students to think about their favorite carnival activities. On paper, have them draw or write about how they can use technology to recreate these activities indoors on a rainy day.

Crafty Carnival Decorations (15 minutes):

Optionally, let students use craft supplies to create colorful decorations for their indoor carnival. Encourage them to be imaginative with their designs.

Digital Carnival Exploration (20 minutes):

If devices are available, guide students to explore online games or activities related to their chosen carnival ideas. This could include virtual games, interactive stories, or educational apps.

Cozy Indoor Setup (10 minutes):

Arrange blankets or cushions in a cozy indoor space. Ask students to place their drawings and decorations around to create a festive atmosphere.

Digital Story Sharing (15 minutes):

Have each student share their ideas and stories about how technology can make a rainy day more fun. Encourage them to describe the digital carnival booths they've imagined.

Tech Playtime (15 minutes):

Let students enjoy the digital games together. Rotate between different activities, allowing them to experience the imaginative world created by their peers.

Discussion and Snack (10 minutes):

Wrap up with a short chat about their favorite parts of the digital carnival. Discuss how technology brings joy on a rainy day. Enjoy a cozy snack time together.

Tech Fun Certificates (5 minutes):

Conclude the activity by giving each student a "Tech Fun Explorer Certificate" to celebrate their creativity and enthusiasm in making rainy days more enjoyable with technology.

This simplified version maintains the essence of the activity, focusing on the joy of exploring technology indoors on a rainy day in a fun and imaginative way.

TECHNOLOGY follow up

The takeaway from this section is that technology can solve problems. One of those problems might be how technology is used to entertain us (games and apps), or create new worlds like CGI) or make our lives easier (using computers in creative ways). Tech is everywhere!

THE ENGINEERING PLAYS

Activity: "Travel Through Time"

Objective:

To have fun learning about different ways people travel and the role of engineering in creating transportation.

Materials Needed:

- Paper and colored markers

Instructions:

Introduction (5 minutes):

- Talk with students about how engineers help create things for us to travel from one place to another, like cars, planes, and boats.

Draw Your Time Traveler (15 minutes):

- Ask each student to draw a "Time Traveler" on paper. It can be a person or a fun character that travels through time to experience different ways of getting around.

Storytime (15 minutes):

- Have each student share a short story about their Time Traveler using various modes of transportation. Encourage them to get creative and imagine exciting adventures.

Transportation Drawings (15 minutes):

Optionally, students can draw their favorite mode of transportation from the past or present. It could be a simple drawing of a car, plane, boat, or anything they find interesting.

Show and Tell (15 minutes):

Allow students to showcase their Time Travelers and transportation drawings to the class. They can explain why they chose a particular mode of transportation.

Group Drawing Activity (15 minutes):

Divide students into small groups and ask each group to draw a future vehicle that hasn't been invented yet. They can share their ideas with the class afterward.

Discussion (10 minutes):

Wrap up with a short discussion. Ask students about their favorite ways to travel and what they learned about engineering and transportation.

Time Traveler Certificates (5 minutes):

Conclude the activity by giving each student a "Time Traveler Explorer Certificate" for their creative journey through different modes of transportation.

This simplified activity focuses on drawing, storytelling, and imagination to introduce elementary students to the concept of engineering in transportation history.

Activity: "Fashion Engineering Creations"

Objective:

To introduce elementary students to the connection between engineering and fashion design through a fun and creative activity.

Materials Needed:

- Paper and colored markers
- Craft supplies (fabric scraps, buttons, yarn, etc.)
- Glue or tape
- Scissors

Instructions:

Introduction (5 minutes):

Start by discussing with students how engineering plays a role in designing and creating clothing. Explain that engineers use their creativity to make functional and stylish garments.

Design Your Outfit (15 minutes):

Ask each student to imagine they are fashion engineers. Provide them with paper and colored markers and instruct them to design their own unique outfit. Encourage creativity and originality.

Crafty Clothing Creations (30 minutes):

Provide craft supplies such as fabric scraps, buttons, yarn, etc. Allow students to bring their outfit designs to life by cutting and pasting these materials onto their drawings. They can create patterns, add accessories, and experiment with textures.

Fashion Show (15 minutes):

Arrange a mini "Fashion Show" in the classroom. Have each student showcase their fashion engineering creations to the class. They can describe their designs and explain how engineering concepts were used (e.g., patterns, structure).

Peer Reviews (10 minutes):

After the fashion show, encourage students to give positive feedback to their peers. Ask questions like:

- What do you like about your friend's design?
- How did they incorporate engineering into their outfit?

Discussion (10 minutes):

Engage in a brief discussion about the activity. Talk about the creativity involved in both engineering and fashion design. Ask students if they noticed any similarities between the two.

Fashion Engineer Certificates (5 minutes):

Conclude the activity by awarding each student a "Fashion Engineer Certificate" for their imaginative and stylish clothing designs. Celebrate their efforts in combining engineering and fashion.

This simple and fun activity allows elementary students to explore the collaboration between engineering and fashion design, fostering creativity and understanding of how these two fields intersect.

Activity: "Artistic Engineers Unite"

Objective:

To highlight the similarities between studio artists and engineers, emphasizing skills like creativity, attention to detail, design principles, visualization, and more in a fun and simple way for elementary students.

Materials Needed:

- Paper and colored markers
- Craft supplies (optional)
- Building blocks or construction toys (optional)

Instructions:

Introduction (5 minutes):

Begin by talking to students about how both artists and engineers share similar skills. Explain that artists use creativity and attention to detail, just like engineers do when designing and building things.

Creativity Showcase (15 minutes):

Ask each student to showcase their creativity on paper. Give them the freedom to draw or doodle anything that comes to their minds. Emphasize that this is an opportunity to express their artistic side.

Design Your Dream (15 minutes):

Instruct students to think about something they'd like to create – it could be a dream house, a cool gadget, or a magical creature. Have them draw or describe their creation, focusing on design principles and attention to detail.

Crafty Creations (20 minutes):

Optionally, provide craft supplies for students to turn their designs into 3D creations. They can use materials like paper, cardboard, or building blocks to bring their imaginative ideas to life.

Creative Visualization (10 minutes):

> Guide students in a visualization exercise. Ask them to close their eyes and imagine a world where they are both artists and engineers. What would it look like? What kind of things would they create?

Show and Tell (15 minutes):

> Allow students to present their drawings, crafty creations, or share their visualizations with the class. Encourage them to talk about the skills they used, such as creativity, attention to detail, and design principles.

Discussion (10 minutes):

> Engage in a short discussion about the similarities between being a studio artist and an engineer. Ask students about the skills they noticed in both fields and how they applied them in the activity.

Artistic Engineer Certificates (5 minutes):

> Conclude the activity by awarding each student an "Artistic Engineer Certificate" for their imaginative creations and showcasing the skills shared by studio artists and engineers.

This fun and simple activity allows elementary students to explore the common skills between studio artists and engineers while encouraging creativity and hands-on expression.

Activity: "Whispering Wonders"

Objective:

To engage elementary students in a fun and interactive activity that explores engineering and a creative way to communicate using simple materials.

Materials Needed:

- Dixie cups (or small plastic cups)
- String (yarn or thin twine)
- Craft supplies (optional)
- Scissors
- Markers or colored pencils
- Tape

Instructions:

Introduction (5 minutes):

Begin by discussing with students the importance of communication and how engineers use creative solutions to make communication more efficient. Introduce the challenge of engineering a fun and effective way to communicate using simple materials.

Whispering Wonders Planning (10 minutes):

Instruct students to brainstorm and plan their communication devices. They can draw or write down their ideas on paper, considering how to use the Dixie cups and string to transmit messages effectively.

Building the Communication Device (20 minutes):

Distribute Dixie cups, string, scissors, and tape to each student. Allow them to start building their communication devices based on their plans. Encourage creativity and experimentation.

Decoration Time (10 minutes):

Optionally, provide craft supplies for students to decorate their communication devices. They can use markers, colored pencils, or other materials to make their creations visually appealing.

Testing and Iteration (15 minutes):

Allow students to test their Whispering Wonders. Pair them up and have one student whisper a message into one cup while the other listens through the connected cup. Encourage adjustments and improvements based on the testing.

Communicate and Collaborate (15 minutes):

Once the devices are ready, let students communicate with each other using their Whispering Wonders. They can share messages or collaborate on a simple task, fostering teamwork and effective communication.

Show and Share (10 minutes):

Have a "Show and Share" session where each student or group demonstrates their Whispering Wonders to the class. They can explain how their design works and any creative elements they incorporated.

Discussion (10 minutes):

Engage in a class discussion about the engineering process. Discuss what worked well in their designs, any challenges faced, and what they learned about communication and problem-solving.

Whispering Wonder Certificates (5 minutes):

Conclude the activity by awarding each student an "Engineer of Whispering Wonders Certificate" for their creativity and successful communication device. Celebrate their engineering achievements.

This interactive and hands-on activity not only introduces elementary students to basic engineering concepts but also encourages teamwork, creativity, and effective communication.

The ENGINEERING PLAYS FOLLOW UP

This section was about connection through engineering. How can we become more creative in finding ways to connect with each other. Creativity and imagination is required to engineer ways to connect.

THE MATH PLAYS
In the first play, Elliott, who doesn't like math, learns that algorithms are mathematical equations that help guide entertaining videos to you on Reels or TikTok.

Activity: "Magical Match-Up"

Objective:

To make learning about algorithms simple and fun for elementary students.

Materials Needed:

Paper and colored markers
Craft supplies (optional)

Instructions:

Introduction (5 minutes):

Explain that algorithms are like magic instructions that help find things we like. They're a set of steps to discover fun combinations.

Magic Match-Up Design (15 minutes):

Ask students to draw and decorate a "Magic Match-Up" on paper. They can create sections like colors, animals, and activities.

Simple Algorithm (15 minutes):

Help students design a simple algorithm. For example, "If you choose red, think of a favorite animal. If you choose blue, think of a favorite activity."

Explore Your Magic (20 minutes):

Encourage students to follow their algorithms and explore different combinations of things they like. They can think about their favorite color and associate it with a favorite animal or activity.

Optional Crafty Fun (15 minutes):

If time allows, students can use craft supplies to make their Magic Match-Up visually appealing.

Share the Magic (10 minutes):

Have a sharing session where students talk about the combinations they found using their algorithms.

Group Fun (15 minutes):

Divide the class into small groups. Each group can create a group algorithm, taking turns exploring fun match-ups.

Chat Time (10 minutes):

Engage in a brief chat about how algorithms help us find things we like. Ask students what they enjoyed about the activity.

Magic Explorer Certificates (5 minutes):

Conclude the activity by giving each student a "Magic Explorer Certificate" for their creative use of algorithms. Celebrate their magical adventures in combining simple math with fun.

This simplified version allows elementary students to understand algorithms and focusing on creating fun combinations in a straightforward and enjoyable way.

Activity: "Colorful Creations with Math"

Objective:

To demonstrate how artists use math to create paint colors in a fun and engaging way for elementary students.

Materials Needed:

- Paper and colored markers
- Craft supplies (optional)
- Watercolor or acrylic paints
- Paintbrushes
- Color wheel printouts (optional)

Instructions:

Introduction (5 minutes):

Start by discussing with students how artists use math to create a wide range of paint colors. Explain that combining different amounts of primary colors can produce a variety of hues.

Primary Color Exploration (10 minutes):

Introduce the primary colors – red, blue, and yellow. Have students experiment with mixing these colors on paper to see what new colors they can create. Encourage them to make predictions about the outcomes.

Color Mixing Challenge (15 minutes):

Challenge students to mix specific colors using mathematical proportions. For example, ask them to create orange by mixing more red than yellow or vice versa. Use simple math concepts like "more" and "less" to guide their color mixing.

Crafty Color Creations (20 minutes):

Provide craft supplies for students to create a colorful art project. They can use their mixed paint colors to paint imaginative scenes, characters, or abstract designs. This allows them to apply the color mixing concepts in a creative way.

Color Wheel Exploration (15 minutes):

Optionally, provide color wheel printouts for students to understand the relationships between different colors. Discuss how artists use color wheels as a guide to mix and match colors effectively.

Show and Tell (10 minutes):

Have a "Colorful Creations Show and Tell" where students showcase their art projects. Ask them to explain the colors they created and share any interesting discoveries during the activity.

Math and Art Connection (10 minutes):

Engage in a short discussion about how math is used in art. Talk about the proportions and ratios involved in color mixing and how artists use these principles to create visually appealing artwork.

Colorful Creator Certificates (5 minutes):

Conclude the activity by awarding each student a "Colorful Creator Certificate" for their imaginative use of math in creating vibrant paint colors. Celebrate their artistic and mathematical achievements.

This fun and interactive activity not only showcases the connection between math and art but also allows elementary students to experiment with colors and express their creativity through painting.

Activity: "Math Beats Adventure"

Objective:

To demonstrate to elementary students that math is everywhere through an interactive and rhythmic activity inspired by the song lyrics.

ELLIOT
1, 2, 3, 4,
MATH IS THE FOUNDATION
OF ALL THINGS YOU'VE SEEN TODAY

IF YOU WANT TO BUILD OR SING
YOUR BURGER GRILLED, A SWORD TO SWING
THE PITCH AT WHICH A BELL WILL RING
ALL OF THIS, YES, EVERYTHING

IS MATH

HOW OLD ARE YOU? MATH
ONE SLICE OR TWO? MATH
THE SHAPE OF THIS BALL? MATH
Hey you! You look tall! How tall are you?

(beat for an answer)

MATH!

TO UNDERSTAND
TO KNOW THE TRUTH
AND KEEP ALL OF IT STRAIGHT
TO HARNESS ALL THE BUILDING BLOCKS
THAT YOU NEED TO CREATE

ALL OF THIS AND MORE, IT'S TRUE IS - WAIT
FOR IT…
(Counts beats of rest on fingers)
ONE, TWO, THREE, FOUR, FIVE, SIX, SEVEN, EIGHT
MATH

Materials Needed:

Song lyrics printed or displayed
Craft supplies (optional)
Counting objects (building blocks, balls, etc.)
Musical instruments (optional)

Instructions:

Introduction (5 minutes):

Begin by discussing with students the idea that math is all around us. Introduce the song lyrics and emphasize that math is the foundation of many things we encounter daily.

Math Beats Exploration (10 minutes):

Play the song or recite the lyrics with the students. Encourage them to follow along and count the beats using their fingers. Discuss the examples mentioned in the lyrics, such as building, singing, and measuring.

Building Blocks Math (15 minutes):

Provide building blocks or other counting objects. Ask students to build structures while counting the blocks. Discuss how counting and arranging the blocks involve math.

Crafty Creations (15 minutes):

Optionally, provide craft supplies for students to create visual representations of mathematical concepts mentioned in the song. They can craft items like burgers, swords, or bells, emphasizing the connection between math and creativity.

Math Challenges (10 minutes):

Engage students in math challenges inspired by the song. For example, ask them to figure out different ways to slice a paper burger, measure the height of a classmate using counting beats, or create patterns with building blocks.

Musical Math (15 minutes):

Incorporate musical instruments or clapping to explore different rhythms and beats. Ask students to create their own math-inspired beats and share them with the class.

Math Storytelling (10 minutes):

Encourage students to share short stories or scenarios where math is involved. It could be about measuring ingredients for a recipe or counting the slices of pizza at a party.

Math Beats Showcase (5 minutes):

Conclude the activity with a Math Beats Showcase. Students can present their creations, share their stories, and perform their math-inspired beats for the class.

Math Explorer Certificates (5 minutes):

Award each student a "Math Explorer Certificate" for their active participation in the Math Beats Adventure. Celebrate their understanding of how math is everywhere in our daily lives.

This fun and interactive activity not only reinforces the concept that math is everywhere but also allows elementary students to explore mathematical principles through creative and rhythmic expressions.

Game: "Math-Music Match-Up"

Objective:

To make learning about the connection between math and music fun and simple for elementary students through an interactive game.

Materials Needed:

- Paper and markers
- Craft supplies (optional)
- Small cards with notes and musical symbols

Instructions:

Introduction (5 minutes):

Start by talking about how math and music go hand in hand. Explain that notes, key signatures, and pitch involve mathematical elements.

Note Matching Craft (15 minutes):

Provide small cards with notes and musical symbols. Ask students to match these cards to create pairs. They can draw or color their own cards if preferred.

Crafty Key Signatures (15 minutes):

Optionally, let students create their own key signatures using craft supplies. Emphasize the patterns and shapes involved in musical symbols.

Musical Symbol Exploration (15 minutes):

If possible, introduce musical symbols through simple games like "Guess the Note" or clapping patterns. Discuss how patterns in music involve counting and math.

Math-Music Match-Up Hunt (20 minutes):

Organize a simple hunt where students search for hidden musical symbols or notes around the classroom. Each found item can represent a specific pitch or key signature.

Interactive Key Signature Game (15 minutes):

Play a game where students form key signatures by arranging themselves in a specific order. For example, they can stand in a line to represent musical notes.

Musical Pattern Play (15 minutes):

Encourage students to create simple musical patterns using hand claps or tapping. Discuss how repeating patterns involve counting and basic math concepts.

Music-Math Storytime (10 minutes):

Have a storytelling session where students contribute to a story involving musical elements. For instance, a character's journey could include encountering different notes or key changes.

Math-Music Showcase (10 minutes):

Conclude the game with a Math-Music Showcase. Students can present their crafted notes, share their musical patterns, and express what they've learned about the link between math and music.

Harmony Explorers Certificates (5 minutes):

Award each student a "Harmony Explorers Certificate" for their active participation in the Math-Music Match-Up. Celebrate their exploration of the simple yet fascinating connection between math and music.

This simplified game introduces elementary students to the basic link between math and music through interactive and playful activities.

MATH Scrtion follow up. The takeaway from this section is that math and the arts depend one each other whether mixing paint, finding our favorite things, or in all music.

THE ARTS Play– Beige

Activity: "Imagination Unleashed"

Objective:

To encourage elementary students to explore the impact of art and express their creativity in a world without art.

Materials Needed:

- Paper and colored markers
- Craft supplies (optional)
- Storybooks or pictures depicting different forms of art
- Music (optional)

Instructions:

Introduction (5 minutes):

Begin by discussing with students the various forms of art, such as drawings, paintings, sculptures, music, and literature. Emphasize how art is all around us and enriches our lives.

Art Appreciation (15 minutes):

Show storybooks or pictures that depict different forms of art. Discuss each form and ask students to share what they enjoy about art.

Imagining a World Without Art (10 minutes):

Prompt students to imagine a world without any form of art. Ask them to think about how it would feel, look, and sound. Encourage them to express their thoughts through words or drawings.

Creative Expressions (20 minutes):

Provide paper and colored markers or craft supplies. Ask students to create something that represents the absence of art in the world. They can draw, write, or craft their interpretations.

Sharing and Discussion (15 minutes):

Allow students to share their creations with the class. Facilitate a discussion about the impact of a world without art. Discuss emotions, colors, and expressions they missed.

Immersive Music Experience (10 minutes):

If possible, play different types of music and ask students to close their eyes and imagine how the world would be without the beauty of music. Discuss their feelings afterward.

Art Revival (15 minutes):

Introduce the idea of bringing art back into the world. Ask students to create something positive and vibrant that represents the revival of art. This could be a collaborative art piece or individual creations.

Gallery Walk (10 minutes):

Arrange a mini art gallery in the classroom. Let students walk around and admire each other's creations. Discuss the positive changes they see with the reintroduction of art.

Reflection and Conclusion (10 minutes):

Have a reflective discussion about the importance of art in our lives. Ask students how the absence and return of art made them feel. Conclude by emphasizing the value of creativity and expression.

Art Enthusiast Certificates (5 minutes):

Award each student an "Art Enthusiast Certificate" for their imaginative exploration and creative expressions. Celebrate their understanding of the significance of art.

This activity aims to engage elementary students in thinking about the impact of art on their lives and encourages them to express their creativity through various forms of artistic representation.

FINAL ACTIVITY that showcases all of the concepts of STEAM education:

Activity: "STEAM Fusion Fiesta"

Objective:

To engage elementary students in a dynamic STEAM (Science, Technology, Engineering, Arts, and Math) Fusion Fiesta that seamlessly integrates various elements to showcase the interconnectedness of arts and STEM education.

Materials Needed:

Paper and colored markers
Craft supplies
Musical instruments or audio devices
Building blocks or construction toys
Dice
Certificates for participants
Optional decorations for a festive atmosphere

Instructions:

Welcome and Introduction (10 minutes):

Welcome students to the STEAM Fusion Fiesta. Explain that they are about to embark on a journey that combines the excitement of a fiesta with the exploration of STEAM concepts.

Fiesta Fusion Challenge (30 minutes):

In the main activity, students rotate through different fiesta-themed stations that seamlessly integrate arts and STEM:

- Artful Math Craft: Create vibrant crafts using math concepts such as shapes, patterns, and colors.
- Harmony Groove: Engage in a rhythmic exploration of musical patterns, emphasizing the mathematical aspects of music.
- Engineering Fiesta: Construct imaginative structures with building blocks, focusing on both engineering and creative design.
- Tech-Art Dance Off: Learn a dance routine that merges technology with artistic expression.

Fiesta Showcase (15 minutes):

Gather all students for a Fiesta Showcase. Each group presents their creations and performances, showcasing the harmonious fusion of arts and STEM.

Reflection and Celebration (10 minutes):

Engage in a short reflection session where students share their favorite parts of the Fiesta and discuss what they learned about the connections between arts and STEM. Celebrate their creativity and enthusiasm for learning.

STEAM Fiesta Certificates (5 minutes):

Award each student a "STEAM Fiesta Explorer Certificate" for their active participation in the Fiesta. Celebrate their achievements and understanding of the integral relationship between arts and STEM.

This STEAM Fusion Fiesta offers a comprehensive and fun experience for elementary students, highlighting the fusion of arts and STEM in an engaging and festive atmosphere.