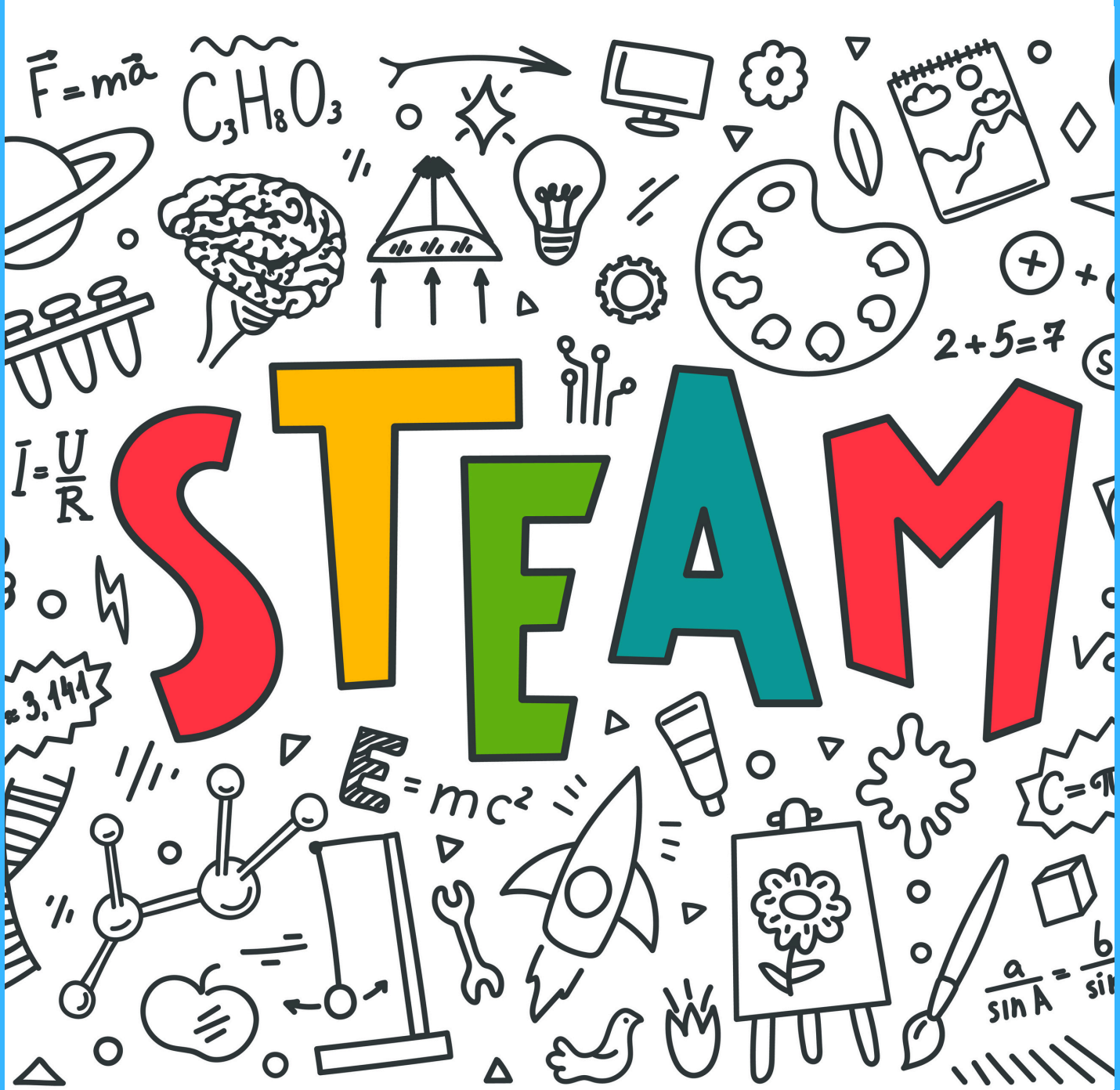
1UP EDU

CONNECT. PLAY. GROW.

A GAMING BASED STREAM CURRICULA



ISTE

NEXT GENERATION SCIENCE STANDARDS

P21 PARTNERSHIP FOR 21ST CENTURY LEARNING

CASEL ALIGNED

CSTA K-12 COMPUTER SCIENCE STANDARDS

CTE

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1UpEDU Purpose

The purpose of 1UpEDU is to provide educational resources, programs, and tools that use gaming, creativity, and interactive learning to foster personal growth, collaboration, and essential life skills. It focuses on integrating Social Emotional Learning (SEL) and STREAM philosophies into engaging activities, helping students and educators alike develop competencies such as teamwork, problem-solving, and emotional intelligence.

Our Thanks

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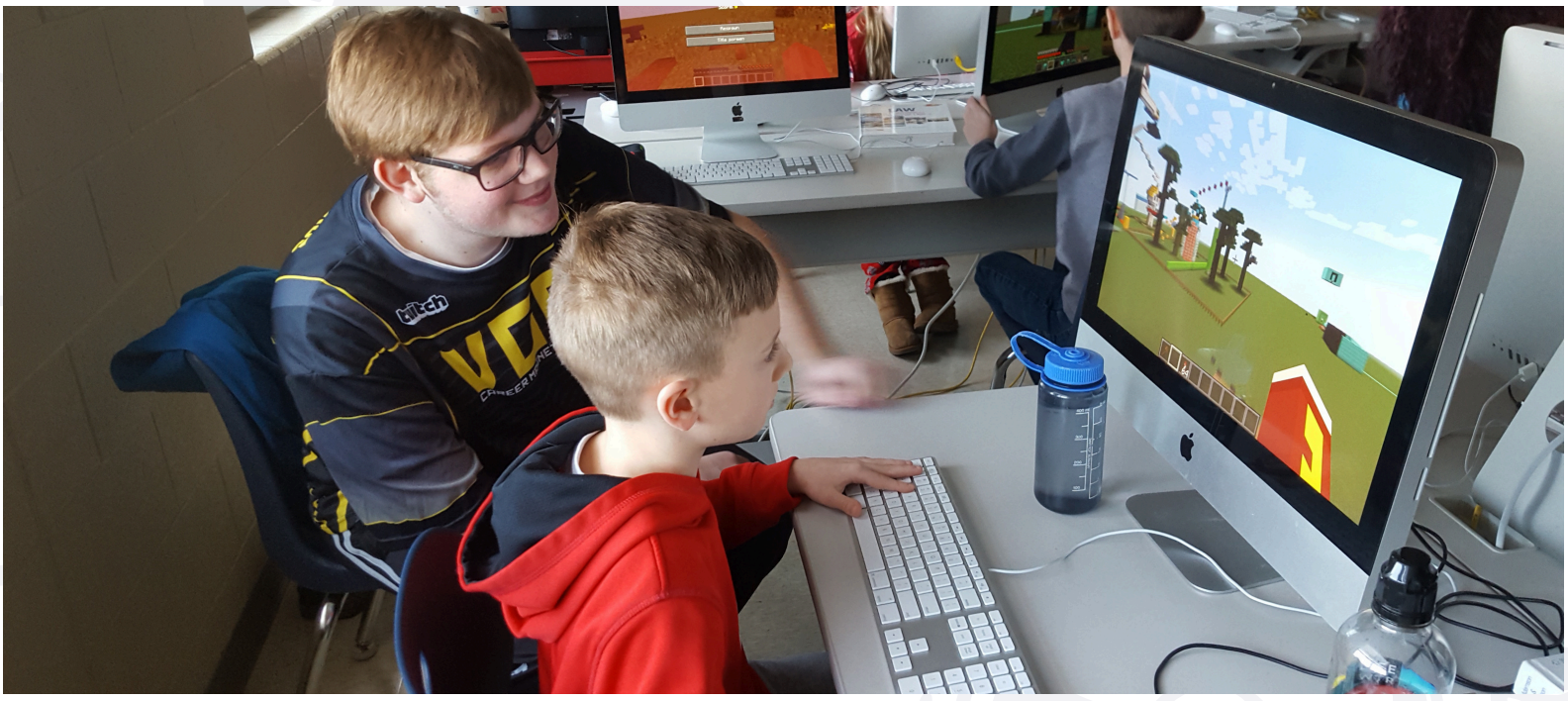


Chapter 1

TO STEM, STEAM, OR STREAM?

When introducing students to the gaming industry, **educators can choose STEM, STEAM, or STREAM** approaches based on their teaching goals, the needs of their students, and the skills they want to emphasize. Each framework offers distinct advantages for exploring the diverse and dynamic world of gaming.

For educators aiming to focus on the technical backbone of the gaming industry, **STEM is an excellent choice.** It equips students with analytical and problem-solving skills essential for understanding the technical aspects of game development. This approach prepares students for careers in programming, engineering, and technology, where they can build and optimize the systems that power games.

Teachers looking to blend technical expertise with artistic creativity may find **STEAM to be the ideal approach.** By integrating the arts, students explore how creativity enhances game design, storytelling, and user engagement. This framework emphasizes the importance of aesthetics, narrative, and innovation alongside technical skills, helping students craft games that are both functional and captivating.

For a more comprehensive approach that incorporates literacy, communication, and storytelling, **STREAM stands out.** This framework highlights the value of writing, research, and narrative in gaming, preparing students to create immersive worlds, analyze industry trends, and engage with the ethical dimensions of technology. STREAM encourages students to develop the communication and critical thinking skills essential for exploring the broader impact of gaming.

Framework	Best for Teachers Who Want to...	Key Benefits
STEM	Focus on technical skills like coding, physics, and mathematics.	Prepares students for programming, game engineering, and other technical careers in gaming.
STEAM	Blend creativity with technical skills, highlighting the importance of art, music, and storytelling in games.	Helps students understand how design and aesthetics enhance gaming experiences.
STREAM	Incorporate storytelling, research, and literacy into game development and exploration of industry trends.	Develops communication skills, fosters deep thinking about gaming ethics, and prepares students for narrative-driven careers.

Focus	Applications in Gaming	Example Activities
STEM	Technical development of games, including coding, physics, and mathematics.	Coding game engines, simulating physics for realistic movements, designing 3D environments.
STEAM	Enhancing games with artistic elements like visuals, music, and narratives.	Designing character art, composing soundtracks, writing engaging game stories.
STREAM	Adding literacy and storytelling to build immersive worlds and engaging educational content.	Writing lore, researching historical accuracy, creating interactive educational tools within games.

STEM and the Gaming Industry

In the gaming industry, STEM focuses on the technical backbone of game development. Science, technology, engineering, and mathematics are essential for creating the mechanics, graphics, and functionality of games.

Key Applications:

- Science: Understanding physics to create realistic movements, lighting, and environments in games.
- Technology: Coding and programming to build game engines and ensure smooth gameplay.
- Engineering: Developing hardware like gaming consoles and controllers, as well as optimizing software for different platforms.
- Mathematics: Using algorithms and geometry to design 3D models, animations, and game mechanics.

Example Careers:

- Game Developer
- Systems Engineer
- Data Analyst for Player Metrics

Examples of STEM Activities in Gaming:

- Coding AI for non-playable characters (NPCs).
- Using physics simulations to develop realistic game environments.
- Applying math to create dynamic leveling systems.

STEAM and the Gaming Industry

STEAM integrates the Arts into the gaming industry, highlighting the importance of creativity and visual storytelling in game design and player engagement. It ensures that games are not just technically sound but also visually appealing and emotionally impactful.

Key Applications:

- Design and Creativity: Creating character designs, landscapes, and immersive environments.
- Storytelling: Developing compelling narratives that captivate players.
- Music and Sound Design: Composing original soundtracks and sound effects to enhance the gaming experience.

Example Careers:

- Game Artist
- Narrative Designer
- Sound Engineer

Examples of STEAM Activities in Gaming:

- Designing concept art for a game's characters and settings.
- Writing engaging storylines that guide the player's experience.
- Integrating interactive art exhibits into virtual reality games.

STREAM and the Gaming Industry

STREAM adds Reading (or Writing) to the mix, emphasizing literacy, communication, and narrative integration in game design. This is crucial for creating games that not only entertain but also educate, inform, or convey a message.

Key Applications:

- Story Development: Crafting complex worlds and characters with depth and purpose.
- Research and Documentation: Ensuring historical or scientific accuracy in educational games.
- Player Engagement: Writing in-game tutorials, instructions, and dialogues that enhance the player's understanding and immersion.

Example Careers:

- Game Writer
- Technical Writer for Game Manuals
- Content Creator for Game Lore

Examples of STREAM Activities in Gaming:

- Writing detailed lore for a fantasy RPG (Role-Playing Game).
- Researching real-world events to design historically accurate game levels.
- Creating an educational game that teaches math or science through interactive gameplay.

Partnership for 21st Century Learning and STREAM Based Gaming Projects

Critical Thinking and Problem Solving

- **Defining Problems:** Encourage students to identify real-world problems or challenges they want to address through their gaming projects. For example, students could create a game that simulates environmental conservation, requiring them to understand and address ecological issues.
- **Analyzing and Evaluating Evidence:** Students can gather and analyze data related to their game development process, such as player feedback or in-game statistics, to refine and improve their designs. This process enhances their ability to critically assess information and make informed decisions.
- **Systems Thinking:** Games often involve complex systems that students must design and manage. By understanding how different components interact within their games, students develop systems thinking skills, essential for solving multifaceted problems in various fields.

Creativity and Innovation

- **Idea Generation and Brainstorming:** Promote creativity by encouraging students to brainstorm innovative game ideas that integrate scientific concepts with artistic design. For instance, designing a game that visualizes the water cycle in a creative and engaging way.

Creativity and Innovation Continued

- **Design and Prototype Development:** Guide students through the process of creating prototypes for their games, allowing them to experiment with different designs and mechanics. This iterative process fosters innovation as students learn to refine their ideas and overcome design challenges.
- **Artistic Expression:** Incorporate opportunities for students to express themselves artistically through game design, including character creation, storytelling, and visual aesthetics. This not only enhances creativity but also integrates arts into STEM education, aligning with the STREAM approach.

Communication

- **Articulating Ideas:** Encourage students to clearly communicate their ideas and the purpose of their games, both in written and oral formats. This includes presenting their game concepts to peers, writing detailed game design documents, and creating marketing materials.
- **Using Digital Media:** Students can use various digital tools to create and share their games, enhancing their ability to communicate through modern media. This could include creating trailers, websites, or social media campaigns to promote their games, thereby honing their digital communication skills.
- **Feedback and Collaboration:** Emphasize the importance of receiving and giving constructive feedback. Students should regularly present their work to peers and mentors, incorporating feedback to improve their projects.

Collaboration

- **Teamwork:** Encourage students to work in teams to develop their games, emphasizing the value of collaboration in achieving common goals. Students can take on different roles, such as programmer, artist, or project manager, to simulate a real-world game development team.
- **Global and Cross-Cultural Collaboration:** Promote opportunities for students to collaborate with peers from diverse backgrounds or even different countries, using online platforms. This can broaden their perspectives and teach them to work effectively in multicultural environments.
- **Conflict Resolution:** Teach students strategies for resolving conflicts that may arise during collaborative projects, such as differing opinions on game design. This helps them develop interpersonal skills and learn to navigate challenges in team settings.

Information, Media, and Technology Skills

- **Digital Literacy:** Develop students' proficiency in using game design software, coding languages, and digital tools. This includes learning how to effectively search for and evaluate information online, a crucial skill in the digital age.
- **Media Creation:** Students should be encouraged to create various forms of media, such as game trailers, walkthroughs, or promotional videos, that demonstrate their understanding of both the technical and creative aspects of game design.
- **Understanding the Impact of Technology:** Discuss with students the broader impact of technology on society, including the ethical implications of game design and the potential of games to educate and influence public opinion.

Life and Career Skills

- **Flexibility and Adaptability:** Teach students to adapt their game projects as they encounter new challenges or receive feedback. This skill is crucial for success in the fast-paced and ever-changing technology industry.
- **Initiative and Self-Direction:** Encourage students to take initiative in their learning, setting personal goals for their projects and working independently to achieve them. This fosters a sense of ownership and responsibility.
- **Productivity and Accountability:** Set clear deadlines and expectations for game development projects, teaching students to manage their time effectively and be accountable for their contributions to the team.

Integrating the Four Cs in STREAM

- **Critical Thinking:** Use game-based projects to challenge students to think critically about complex issues, such as sustainability or social justice, and to create games that reflect thoughtful solutions.
- **Creativity:** Allow students the freedom to explore their creativity in all aspects of game design, from concept to execution, ensuring that artistic expression is valued alongside technical skills.
- **Communication:** Foster effective communication by requiring students to articulate their ideas clearly, whether they are pitching a game concept, writing a game script, or designing a user interface.
- **Collaboration:** Design projects that require students to collaborate across disciplines, combining their strengths in science, technology, engineering, arts, and mathematics to create innovative gaming experiences.

Next Generation Science Standards and STREAM Based Gaming Projects

Science and Engineering Practices (SEPs)

- **Asking Questions and Defining Problems:** Encourage students to ask scientific questions and define problems they want to solve through their gaming projects. For example, designing a game that simulates an ecological system requires understanding the problem of ecosystem balance.
- **Developing and Using Models:** Students can develop models or simulations of scientific concepts within their games, such as creating a game level that models the water cycle or planetary motion.
- **Planning and Carrying Out Investigations:** Students could design experiments within their games to explore scientific phenomena, such as a game that allows players to test different materials' effectiveness in building structures.
- **Analyzing and Interpreting Data:** In game design, students might collect and analyze data on player behavior or the effectiveness of certain game mechanics to understand real-world phenomena.

Crosscutting Concepts (CCCs)

- **Patterns:** Games can help students identify and use patterns, such as in coding sequences, visual designs, or mathematical operations in game mechanics.
- **Cause and Effect:** Students can explore cause and effect relationships in games, like how changing one variable (e.g., gravity in a physics-based game) affects the outcome.

Crosscutting Concepts Continued

- Systems and System Models: Games often simulate complex systems, such as ecosystems, economies, or social systems, which helps students understand how different parts of a system interact.
- Structure and Function: In designing characters or environments, students can explore how the structure of an object or system affects its function within the game.

Disciplinary Core Ideas (DCIs)

Physical Science (PS)

- PS1: Matter and Its Interactions: Students might design games that explore chemical reactions or material properties.
- PS2: Motion and Stability: Create games that require understanding forces and motion, such as a physics-based puzzle game.
- PS3: Energy: Develop games that involve energy transfer, conservation, or renewable energy concepts.

Life Science (LS)

- LS1: From Molecules to Organisms: Students can create games that simulate biological processes, such as cell division or ecosystems.
- LS2: Ecosystems: Design games that require managing ecosystems, focusing on interdependencies within environments.
- LS3: Heredity: Games that involve genetics, breeding, or inheritance can be used to explore heredity concepts.

Earth and Space Science (ESS)

- ESS1: Earth's Place in the Universe: Create games that explore space, planets, and the universe.

Disciplinary Core Ideas Continued

- ESS2: Earth's Systems: Design games that simulate weather systems, geological processes, or climate change.
- ESS3: Earth and Human Activity: Students might design games that explore the impact of human activity on Earth, focusing on sustainability or resource management.

Engineering, Technology, and Applications of Science (ETS)

- ETS1: Engineering Design: Encourage students to follow the engineering design process in creating their games, including defining the problem, brainstorming solutions, prototyping, and testing.

Integration with STREAM

- **Art and Design:** Incorporate artistic elements into the game, such as character design, environment aesthetics, and storytelling, while adhering to the scientific principles.
- **Technology and Coding:** Use technology, such as coding languages and game design software, to create interactive and educational games that meet NGSS goals.
- **Mathematics:** Apply mathematical concepts like geometry, probability, and algebra in game mechanics, algorithms, and level design.

Examples of the CASEL 5 Competencies in STREAM Projects

Self-Awareness

Reflection on Learning: Through STREAM projects, students often engage in self-assessment and reflection on their learning process. For example, when coding a game, they need to identify their strengths and weaknesses in problem-solving, which builds self-awareness.

Personal Interests: STREAM projects, particularly in gaming, allow students to explore areas of personal interest, such as art, design, or technology, helping them understand their preferences, passions, and identities.

Self-Management

Project Planning and Execution: Managing a STREAM-based gaming project requires setting goals, planning tasks, and managing time effectively. These activities help students develop self-discipline and the ability to stay organized and motivated throughout the project.

Perseverance: When students encounter challenges, such as debugging code or optimizing a game design, they learn to manage stress and persevere until they find solutions, which is a critical aspect of self-management.

Social Awareness Cont.

- **Collaborative Efforts:** Many STREAM projects are team-based, requiring students to work with peers from diverse backgrounds. This fosters empathy, respect for different perspectives, and an understanding of how their actions affect others.
-
- **Global Issues:** STREAM projects that focus on global challenges (e.g., climate change or sustainability) in gaming contexts can help students develop a broader understanding of societal issues and the impact of science and technology on the world.

Relationship Skills

Team Collaboration: STREAM-based gaming projects often require collaboration, where students must communicate effectively, resolve conflicts, and work together toward common goals. These experiences help build trust, cooperation, and effective communication skills.

Peer Feedback: In gaming projects, peer reviews and collaborative testing phases provide opportunities for students to give and receive constructive feedback, enhancing their ability to maintain healthy relationships

Responsible-Decision Making

Problem-Solving: STREAM projects inherently involve complex problem-solving. Students must evaluate various options, predict outcomes, and make informed decisions about the best course of action, all of which are key components of responsible decision-making.

Chapter 2

Types of Thinking Processes

To help your gaming club make a real impact, encourage students to identify a community need and use the Design Thinking Process to create solutions. This approach transforms gaming into a powerful platform for learning STREAM skills while fostering creativity, critical thinking, and a sense of responsibility.

Gaming clubs provide a safe, supportive environment for students to practice collaboration, communication, and problem-solving. These are the same skills used in both gaming and STREAM projects. Whether coding a game for a cause, designing game-themed art, or hosting a community event, students can build technical expertise while making meaningful contributions.

The teamwork and strategy needed to defeat a level 7 Orc in Dungeons and Dragons mirror the dynamics of any successful group project. By linking gaming to STREAM challenges, you equip students with essential skills for both academic and real-world success while showing how gaming can inspire creativity and positive change.

Design Thinking Process

Step 1: Empathize

Who or what can you help as a group?
Encourage students to discuss points openly and allow for opinions to be shared.

Step 2: Define

Have your members brainstorm a list of charities, people, or projects they feel need to be addressed. Pair down your list in order to identify an agreed upon cause.

Step 3: Ideate

This is where you begin developing your plan of action. What can you and your group actually do? Who can you call on to help your group? Have your students identify the groups strengths and begin to develop an approach.

Step 4: Prototype

Lock down your idea and allow your students to set roles and responsibilities as the group lays out a definitive plan of action, complete with date, time, and expectations. During this stage your student will experi- ence both leading and following as they work towards a common goal.

Step 5: Test

Testing plays a crucial role in the design thinking process for students because it helps them see how their ideas work in real life. When students test their projects, they get valuable feedback, learn what works well, and discover what needs to be improved. This step allows them to understand if their solutions actually solve the problem they set out to address. By testing their designs, students can make adjustments, learn from their mistakes, and create better, more effective projects that truly meet the needs of others. It's a hands-on way for them to learn and grow through real-world experience.

Step 6: Implement

Implementing a finished design thinking project in a school is beneficial because it allows students to see the real impact of their ideas. It helps them build important skills like problem-solving, teamwork, and communication. By bringing their ideas to life, students feel proud of their work and learn how they can make a difference in their school and community.

The Engineering and Design Process

Step 1: Define the Problem

Identify and clearly articulate the challenge or need that requires a solution. This step includes understanding the problem's context, goals, and constraints.

Step 2: Research and Gather Information

Investigate the problem by gathering data, exploring existing solutions, and learning from similar projects. This research helps to build a strong foundation for the design.

Step 3: Specify Requirements

Determine the criteria the solution must meet and any limitations or constraints, such as budget, materials, or time. This step ensures the solution is realistic and effective.

Step 4: Brainstorm and Develop Ideas

Generate multiple potential solutions through brainstorming. Encourage creative thinking and collaboration to explore various approaches.

Step 5: Develop and Test Prototypes

Create a model or prototype of the chosen idea. This tangible representation helps to visualize and test how the solution might work in practice.

Step 6: Develop and Test Prototypes

Create a model or prototype of the chosen idea. This tangible representation helps to visualize and test how the solution might work in practice.

Step 7: Implement the Solution

Finalize the design and bring the solution to life. This step involves building the final product and deploying it for use.

Step 8: Communicate Results

Share the design and its impact with stakeholders. Present the process, results, and lessons learned to showcase the solution's value.

2 Design Processes and Gaming Examples

Aspect	Engineering and Design Process	Design Thinking Process
Focus	Creating functional and efficient technical solutions for game mechanics, graphics, and performance.	Designing a human-centered gaming experience that prioritizes player engagement and satisfaction.
Primary Goal	Solve technical problems, like optimizing frame rates or building scalable multiplayer systems.	Develop innovative and user-friendly game features that enhance the player experience.

Aspect	Engineering and Design Process	Design Thinking Process
Problem Definition	Starts with a specific technical challenge, such as building a physics engine or improving AI behavior.	Begins by empathizing with players to understand their needs, frustrations, or desires in a game.
Creativity vs. Functionality	Prioritizes technical functionality, ensuring the game runs smoothly and efficiently. Creativity is applied to solve technical challenges.	Focuses on creativity and innovation, improving the look, feel, and accessibility of the game for players.
Iteration	Iterative testing of game mechanics, performance, and system stability to meet technical benchmarks.	Driven by player feedback through playtesting and refining the experience to meet user expectations.
Applications	Game engine development, system architecture, hardware optimization, and technical problem-solving.	Game design, user interface (UI) and user experience (UX) design, narrative development, and player engagement.

Inspiring leadership among students through STREAM projects.
A mentor can promote leadership and social skills in students by guiding them through a STREAM project. By encouraging students to take the lead on projects they care about, such as designing a community-focused solution or developing a product that addresses a local need, they can develop critical leadership abilities. As students plan, collaborate, and communicate to complete the project, they learn to work effectively as a team and take initiative. This experience not only enhances their technical skills but also fosters a sense of responsibility and belonging as they see the positive impact of their work on the community.

12 STREAM Teachable Skills

Games offer a fun and interactive way to teach a variety of life skills that are applicable both inside and outside the classroom. Here's a list of teachable life skills that can be derived from playing games in an educational setting.

Collaboration: Working effectively with others, sharing ideas, and contributing to a common goal.

Problem-Solving: Identifying challenges and developing creative solutions using critical thinking.

Communication: Expressing ideas clearly, listening to others, and giving and receiving feedback.

Leadership: Taking initiative, guiding the team, and making decisions that help the project move forward.

Time Management: Organizing tasks, setting deadlines, and prioritizing work to ensure the project is completed on time.

Adaptability: Being flexible and open to change when faced with unexpected challenges or new information.

Responsibility: Taking ownership of individual tasks and being accountable to the group for the project's success.

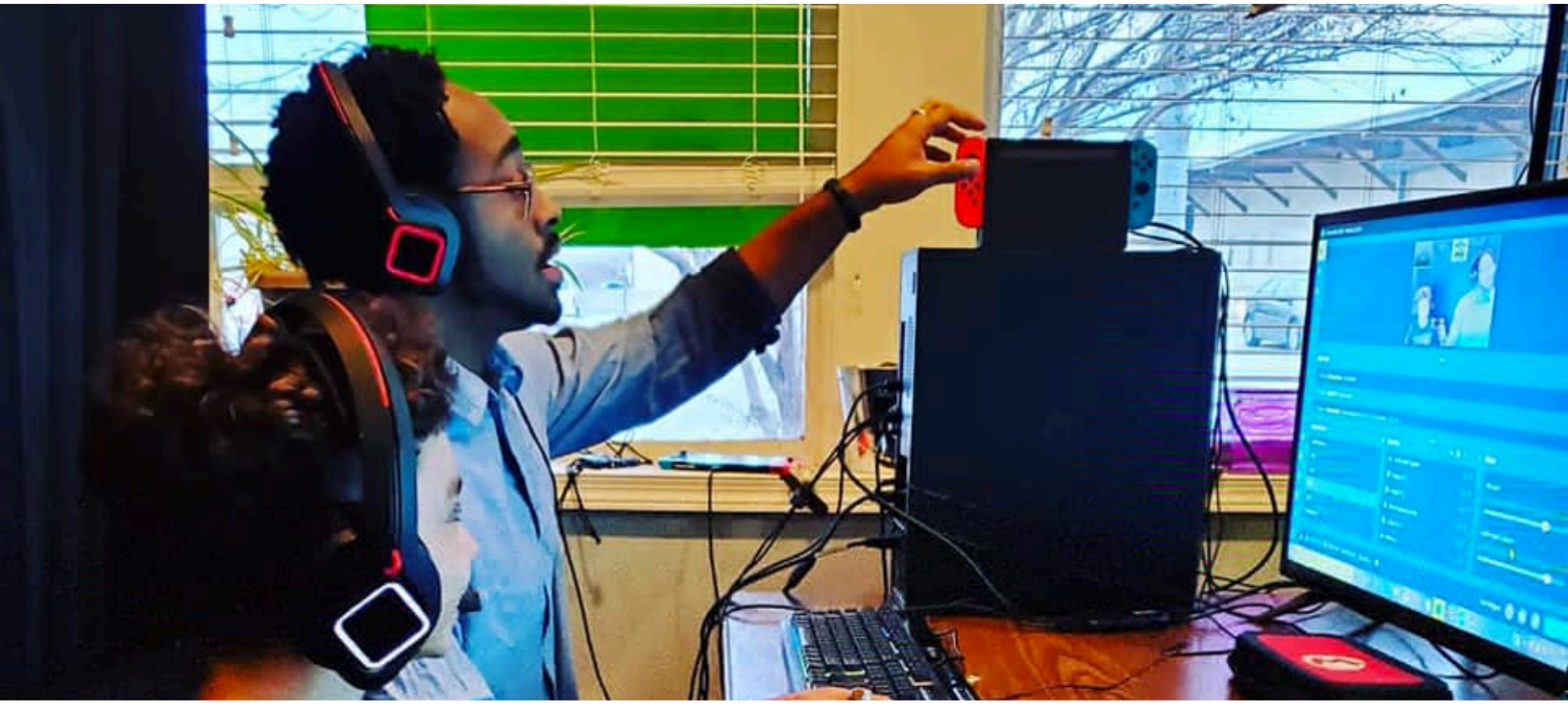
Resilience: Persevering through difficulties, learning from failures, and bouncing back from setbacks.

Creativity: Thinking outside the box to generate innovative ideas and solutions within the project.

Memory Skills: Keeping track of colors, numbers, or movement during the game can enhance memory skills.

Empathy and Perspective-Taking: Observing and predicting the emotions and reactions of other players can foster empathy and the ability to take another's perspective.

Negotiation Skills: In some game variations, players can negotiate alliances or strategies, teaching the basics of negotiation.



Chapter 3

19 STREAM Projects

In a gaming club, STREAM projects and lesson plans can be powerful tools to encourage lifelong learning and explore potential career pathways. By connecting STREAM principles with Social Emotional Learning (SEL) objectives, teachers can guide students through meaningful experiences that blend technical skills with emotional intelligence.

For example, when a player encounters a setback in a game, such as losing resources or failing a challenge, the teacher can prompt students to reflect on their feelings, discuss strategies for managing their emotions, or encourage peers with positive reinforcement. This not only builds self-awareness and self-management but also demonstrates how setbacks are opportunities for growth —a valuable lesson in any career.

Similarly, collaborative in-game tasks can be designed to require effective communication, role negotiation, or collective decision-making, helping students develop relationship management and social awareness. These experiences highlight the importance of teamwork and leadership, skills that are essential in both personal and professional life.

By integrating STREAM into gaming in this way, students engage in dynamic, hands-on learning that not only enhances their technical abilities but also nurtures their emotional and social development. This approach makes learning interactive, reflective, and directly connected to real-world applications, inspiring students to explore careers in game design, engineering, technology, and beyond.

19 P21 STREAM GAMING PROJECTS

1. Design a Custom Game Level

Students can use level design tools to create their own custom levels within a game, focusing on elements like balance, difficulty, and aesthetics.

2. Develop a Simple Game

Using game development platforms like Scratch or Roblox Studio, students can create their own simple game, incorporating coding, design, and gameplay mechanics.

3. Build Your School in Minecraft

Students can create detailed virtual environments, exploring 3D modeling and texture design, using tools like Minecraft.

4. Create an Educational Game Mod

Modify an existing game to include educational content, such as a historical simulation or math challenges.

5. Design Character Animations

Use software like Blender or Unity to create character animations, focusing on movement, expression, and rigging.

6. Build a Retro Gaming Machine

Use software like Blender or Unity to create character animations, focusing on movement, expression, and rigging.

7. Build a Club Discord Server

Create a space where students can meet up and talk shop about gaming. Learn about setting roles, assigning permissions, and incorporating bots.

8. Create a Game-Based Art Gallery

Design a virtual art gallery within a game where students display their digital artwork or 3D models.

9. Build a Game Soundtrack

Compose and produce music or sound effects for a game, exploring sound design and music production software.

10. Develop a Game Narrative

Write a detailed storyline for a game, including character development, dialogue, and plot twists.

11. Construct a Break Out Room Game

Design and implement a break out room that challenges logical thinking and problem-solving skills.

12. Create a YouTube Channel For Your Club

Develop and maintain a club YouTube channel! Shoot short videos, learn to edit, and how to engage viewers.

13. Analyze Game Economics

Study the in-game economy of a multiplayer game and propose adjustments or improvements, incorporating mathematical models.

14. Design Art on an Old Game Controller

Create a user interface for a game, considering user experience (UX) principles and aesthetics.

15. Build a Game Controller

Use Arduino or other hardware to design and build a custom game controller, exploring engineering and electronics.

16. Conduct a Minecraft Development Workshop

Plan and lead a workshop where club members learn the basics of game development, covering topics like coding, design, and testing.

17. Analyze Game Mechanics

Break down and analyze the mechanics of a popular game, discussing what makes them engaging and how they could be improved.

18. Design a Robotics Mario Kart Course!

Challenge your group to build conquer an obstacle course with legos, humming bird kits, or sphero robotic kits.

19. Design Dungeons & Dragons Characters

Allow your students to design a D&D Character from scratch and bring it to life through 3D printing!

The following collection of sample unit plans provide educators with a diverse and engaging range of teaching strategies and activities tailored to inspire and motivate students across various subjects and grade levels. Each outlined plan is carefully crafted to align with educational standards while addressing the diverse needs and learning styles of students. Whether you are an experienced teacher looking for new ideas or a new educator seeking guidance, these sample lesson plans offer a valuable resource to enrich your teaching practice.

"The future belongs to those who believe in the beauty of their dreams."

Eleanor Roosevelt

STREAM Unit Plan #1
Design a Custom Game Level

Duration: 3 Weeks (One session per week, 1.5-2 hours each)

Objective:
Students will design a single level for a popular video game on paper, focusing on level layout, gameplay mechanics, and visual design.

Materials Needed:
- Drawing supplies (paper, pencils, markers) or digital design tools (if students prefer)
- Reference materials on level design and game mechanics
- Rubric for project assessment

ISTE Standards for Students:
- Creative Communicator: Students use design tools and resources to create original work that communicates ideas effectively.
- Innovative Designer: Students develop, test, and refine creative designs to solve problems.

Common Core Standards:
- ELA-Literacy.W.6-12.4: Produce clear and coherent writing in which development, organization, and style are appropriate to task, purpose, and audience.
- ELA-Literacy.SL.6-12.1: Engage effectively in collaborative discussions, building on others' ideas and expressing their own clearly.

NGSS (Next Generation Science Standards):
- ETS1.A: Defining and Delimiting Engineering Problems.
- ETS1.B: Developing Possible Solutions.

CSTA (Computer Science Teachers Association):
- 2-CS-02: Design projects that combine hardware and software components to collect and exchange data.
- 1B-IC-18: Discuss computing technologies that have changed the world.

National Reading Standards:

- Reading Informational Text (RI): Analyze how an author structures information to support conclusions.
- Reading Standards for Literacy in Science and Technical Subjects: Integrate and evaluate multiple sources of information presented in diverse formats.

Week 1: Introduction to Level Design and Concept Development

Objective:

- Introduce the basics of level design and begin developing concepts for the level.

Activities:

- **Introduction to Level Design:**
  - Discuss the role of level design in video games and how it impacts gameplay and player experience. Analyze levels from popular games, focusing on elements like layout, pacing, and challenges.
  - Explain the project goal: to design a single level for a popular video game (e.g., Super Mario, Minecraft, or Fortnite) on paper.
- **Game Selection and Brainstorming:**
  - Students select a popular video game for which they will design a level. Encourage them to choose a game they are familiar with and enjoy.
  - In small groups or individually, students brainstorm ideas for their level. They should consider the theme, objectives, obstacles, and key gameplay elements.
- **Initial Sketches:**
  - Students create rough sketches of their level layout, focusing on the overall structure and key features (e.g., platforms, enemies, items).
  - Share and discuss these initial sketches within the group, providing constructive feedback.

CASEL Competencies:

- Self-Awareness: Students reflect on their interests and strengths in game design and select a game they are passionate about.
- Social Awareness: Considering how players might experience their level, focusing on engagement and challenge.

P21 STREAM Focus:

- Art & Design: Introducing principles of visual design and layout.
- Engineering: Beginning to think about how gameplay mechanics will function within the level.

Week 2: Refining Level Design and Detailing Gameplay Mechanics
Objective:

- Refine the level design and detail the gameplay mechanics, including player actions, challenges, and rewards.

Activities:

- **Refining the Level Layout:**
  - Students refine their initial sketches, adding more detail to the level layout. This includes specific platforms, obstacles, enemy placement, and item locations.
  - Encourage students to think about the flow of the level, ensuring it offers a balanced mix of challenge and reward.
- **Detailing Gameplay Mechanics:**
  - Students define the gameplay mechanics for their level, including how the player interacts with the environment, overcomes obstacles, and progresses through the level.
  - Discuss elements like difficulty scaling, pacing, and how the level fits into the overall game.
- **Peer Review and Feedback:**
  - Students present their refined designs to the group for feedback. Discuss what works well and what could be improved, focusing on both the layout and the gameplay mechanics.
  - Encourage students to incorporate feedback to enhance their designs.

CASEL Competencies:

- Relationship Skills: Collaborating with peers during the feedback session and incorporating suggestions.
- Responsible Decision-Making: Making thoughtful choices about level design to ensure an enjoyable player experience.

P21 STREAM Focus:

- Mathematics & Engineering: Applying principles of game mechanics, including timing, physics, and challenge progression.
- Art & Design: Further developing the visual and structural elements of the level.

Week 3: Finalizing the Level Design and Presentation
Objective:

- Finalize the level design and present it to the class, highlighting the creative process and design decisions.

Activities:

- **Final Adjustments:**
  - Students make final adjustments to their level designs, ensuring that all elements are well-integrated and the level is cohesive.
  - Finalize the visual presentation of the level, whether it's through detailed sketches, annotated diagrams, or a combination of both.
- **Presentation Preparation:**
  - Students prepare to present their level designs to the class. This includes explaining their design choices, how the level fits within the game, and how it enhances the player experience.
  - Encourage students to create a narrative or walkthrough that guides the audience through the level.
- **Final Presentation:**
  - Each student or group presents their completed level design to the class, highlighting the key features and gameplay mechanics.
  - Allow time for a Q&A session where classmates can ask questions and provide feedback.
- **Reflection Session:**
  - Facilitate a reflection session where students discuss what they learned throughout the level design process.
  - Encourage discussion on how the project helped them develop specific CASEL competencies and STREAM skills.

CASEL Competencies:

- Self-Awareness: Reflecting on personal contributions and design decisions.
- Relationship Skills: Communicating effectively during the presentation and engaging with the audience.

P21 STREAM Focus:

- Art & Design: Showcasing the final level design, including visual and structural elements.
- Technology & Engineering: Discussing how the level could be implemented in the actual game, considering technical constraints and possibilities.

Assessment:

- Participation: Evaluate student engagement and collaboration throughout.
- Project Outcome: Assess the creativity, functionality, and visual appeal of the final level design.
- Reflection: Consider the students' ability to articulate their design process and the development of CASEL competencies.

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Contact information can be found below and we look forward to the conversation. Talk to you soon.

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