

5318 Instructional Design

Subject

STEM-Science

Level of instruction

Third grade

Target audiences

Third-grade students who are interested in expanding their knowledge in the STEM program or Science. Afterschool program.

Key institutional documents that influence the design process

Syllabus: This document describes all the information necessary for the STEM-Science program. The topics and objectives of the program are listed so that parents are familiar with everything.

Outline: It presents a sequence of how the topics will be covered and when.

Science curriculum and standards: Standards describe all the essential information about a course or program. They provide a framework of reference for professional planning.

Competency-based education (CBE) or outcome-based education (OBE)

Instructional design is based on Competency-Based Education (CBE). In the STEM/Science program, students undergo assessments to ensure they can effectively apply a skill or technique they are being taught, rather than simply selecting the correct answer on a traditional exam. By integrating CBE principles into our design, the goal is to empower teachers with the tools and strategies necessary to facilitate meaningful learning experiences that prepare students for success in today's dynamic and ever-evolving world.

Design Approach

The design focuses on blended learning as traditional teaching and technology are used. This allows for a more personalized and flexible learning experience. Teachers and students can use online resources, such as educational videos, interactive simulations, and digital assessments, to supplement their in-person instruction.

Blended learning can offer several benefits, including parent involvement in the program. Also being innovative means greater student engagement, access to a broader range of educational resources, and opportunities for differentiated instruction.

By leveraging the strengths of traditional and online learning modalities, blended learning aims to optimize the learning experience and support student success.

Balance assessment Or/For/As learning

The evaluation strategies that will be used will be informal observations, the completion of the activities within the centers, and one-to-one discussions between teachers and students. Each week we will work on a different topic which will involve a laboratory or project. Self-evaluations will be reflections at the end of the weekly work to know what they think, and what they would do to improve the result obtained, among others.

Moving learners into deeper learning

Instructional design not only fosters critical and advanced learning but also cultivates a dynamic learning environment that encourages collaboration and creativity. By incorporating interactive activities, simulations, and real-world scenarios, students are prompted to apply theoretical knowledge to practical situations, honing their problem-solving abilities and preparing them for the complexities of their future endeavors. Furthermore, instructional design facilitates personalized learning experiences, allowing students to progress at their own pace and catering to diverse learning styles. As a result, learners not only acquire subject-specific knowledge but also develop essential lifelong skills such as adaptability, resilience, and self-directed learning, empowering them to thrive in an ever-evolving world.

Outline

Week 1: Making Recycled Paper

Students will work on the recycling process. The concepts of recycling, the importance and benefits of practicing it will be discussed. Students will work on making recycled paper with materials that can be found in and around the school.

Also, students will watch the video: How Does Recycling Actually Work?

<https://www.youtube.com/watch?v=G5Whi2DDNBM&feature=youtu.be>

Week 2: Talking Trees

In this lesson in our STEM/Science program, students will learn the value of trees and study their components. They will learn and understand the life cycle, how to count the rings, the parts of a tree, and how we can conserve trees. Then we will plant a tree at our school at the end of the week.

Week 3: Water Pollution

This week students will understand the types of contaminants and how they change water quality. They will also understand the difference between point and non-point pollution sources. Students will be introduced to the following concepts:

- a. temperature
- b. pH
- c. dissolved oxygen
- d. E. coli bacteria
- and. nutrients
- F. benthic macroinvertebrates

Week 4: Kinesthetic Astronomy: Earth's Rotation

In this activity, students will understand why the sun rises in the east and sets in the west. Also, students will know how the earth rotates and how long it takes for the earth to rotate and will discover that the stars appear to rise and set just like the sun does.

Week 5: Skydive Into Forces

This interactive activity provides an enjoyable chance for students to delve into the concepts of "invisible" forces such as gravity and air resistance. Through hands-on experimentation, students will construct parachutes and explore their role in facilitating safe landings for skydivers.

3 Column Table

Big Hairy Audacious Goal (BHAG): "To cultivate a generation of young scientists who confidently engage in hands-on exploration, critical thinking, and problem-solving, fostering a deep understanding of scientific concepts and igniting a lifelong passion for inquiry and discovery."

Learning Outcomes	Assessment activities	Learning Activities
Foundational • Developing skills for observation, prediction, and measurement. • Conducting simple experiments and investigations using the scientific method. • Recording and analyzing data using charts, graphs, and tables. • Asking questions and forming hypotheses based on observations.	• Assign group projects or cooperative learning activities where students work together to solve problems, conduct experiments, or complete design challenges. • Assess students' projects based on their research, planning, implementation, and presentation skills, as well as the effectiveness of their solutions in addressing the problem.	• Discussions led by the teacher where the different weekly topics and their components will be discussed. • Students will carry out laboratory activities and create small projects of practical activities where they will be able to put into practice what they have learned in each lesson. • Students will have the opportunity to watch videos where the concepts of recycling, water pollution, tree life, forces and astronomy will be explained.
Application • Apply what you learn in the different weekly lessons to solve real-world problems.	• Project-based assessment: apply what you learned in the lessons to create recycled paper and create Skydive Into Forces. • Carry out tasks and research on digital platforms.	• Collaborative projects where students apply different science skills to design projects that contribute to the real world. • Complete online science activities that involve real-life scenarios.

Integration • Students will discuss the different strategies for different projects and investigations. • Students will compare different different strategies to be able to reach a consensus on which is the best for the project of the week.	• Students will watch videos and make different comments in their interactive notebooks. • Students will look for different references to carry out the project.	• Students carried out projects in collaboration with their classmates to put recycling, water conservation and different forces into practice.
Human Dimension/Caring • Promote a collaborative and harmonious class environment where everyone feels comfortable in class. • Students will work as a team.	• Participate in group activities sharing different ideas and strategies for different lessons. • Provide feedback on the work of other colleagues, focusing on the results of the project and the different strategies they used.	• The students carried out a project on recycling and water pollution. • Short interactions about the project and what they plan to use. • Presentations of projects in class.
Learning How to Learn • Acquire the ability to continually learn throughout life, allowing for continued exploration and mastery of science skills which will help you pursue careers in STEM in the future.	• Assess students' ability to express their approaches in the different areas of science and STEM in the classroom.	• Critical thinking discussions where students discuss the different aspects and strategies used in the different lessons. • Self-reflections in the interactive notebook of weekly assignments.

