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Title of the STEPAM Unit: Liquids

AUTHORS (NAMES /SCHOOL / COUNTRY): EXPERIENCE WORKSHOP, JAGODINA

RELATED SUBJECTS	AGE GROUP OF THE STUDENTS	TOTAL ACTIVITY TIME	LEARNING OBJECTIVES DURING THE LESSON SUBJECT-SPECIFIC COMPETENCIES	LEARNING OBJECTIVES AFTER THE LESSON
Science, Mathematics, Engineering, Physical Education, Arts	1st-4th grade (6 to 11 years old)	90 minutes	• Investigate and compare properties of liquids (color, smell, taste, transparency, density, solubility). • Explore the principles of floating and sinking, relating them to density and buoyancy. • Understand the working principle of submarines and how they control buoyancy.	• Students can describe and classify liquids based on their properties. • Students can explain and predict why objects float or sink using density principles. • Students can demonstrate how a submarine works using a model. • Students will have improved motor skills and

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			• Engage in physical education activities that reinforce teamwork and coordination. • Develop mathematical skills in comparing values (greater than, less than) and fractions.	teamwork through physical activities. • Students can solve mathematical problems using liquid comparisons and fractions.

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OVERVIEW: TOPIC & PURPOSE

This unit explores the **scientific, mathematical, and engineering principles** of **liquids** through hands-on experiments and interactive activities. Students will:

- **Analyze the properties of liquids** through observation and testing.
- **Investigate floating and sinking** by experimenting with different objects in water.
- **Learn about submarines** by building a simple model that demonstrates buoyancy.
- **Participate in water-themed physical activities** that reinforce coordination.
- **Apply math skills** to compare liquid densities and work with fractions.
- **Engage in creative photography,** capturing and editing images of colorful liquid arrangements.

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ACTIVITY PREREQUISITES -

STEAM ELEMENTS

ELEMENT 1: context presentation	What are the properties of liquids? What determines why some objects float and others sink? How do submarines control buoyancy? How can we use liquids to create art and solve math problems?
ELEMENT 2: creative design	Observing and recording liquid properties (color, density, solubility). Conducting floating and sinking experiments with different objects. Designing and building a submarine model using air and water control. Creating artistic liquid photography and enhancing images digitally.
ELEMENT 3: emotional and social learning	Working in teams to conduct experiments and share findings. Developing focus and patience while experimenting with liquids. Encouraging creativity and problem-solving through artistic and engineering challenges.

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STEAM SUBJECT ELEMENTS

STEAM SUBJECTS	SCIENCE	TECHNOLOGY	ENGINEERING	Physical Education	ARTS	MATHEMATICS
SHORT INTRODUCTION TO RELATED SUBJECT ELEMENTS	Understanding liquid properties, density, and buoyancy.	Using videos, simulations, and mobile apps for learning and creativity.	Constructing a working submarine model to explore buoyancy.	Participating in water-based teamwork and movement activities.	Creating liquid-based photography and enhancing images digitally.	Solving comparisons, fractions, and density-related problems.

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SYLLABUS

LESSONS	SUBJECTS	TOPIC OF THE UNIT	LEARNING OBJECTIVES DURING THE LESSON: SUBJECT SPECIFIC COMPETENCIES	LEARNING OBJECTIVES AFTER THE LESSON: STEAM COMPETENCIES
1	**Science, Mathematics, Arts**	**Exploring Liquid Properties**	- Observing and classifying liquids. - Experimenting with solubility and density.	- Students describe liquid properties and how they interact.

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2	**Science, Engineering**	**Floating and Sinking**	- Predicting and testing why objects float or sink. - Understanding buoyancy.	**- Students apply density concepts and analyze real-world applications.**
3	**Engineering, Science**	**Submarine Model**	- Constructing a model submarine using air control. - Exploring how submarines rise and sink.	- Students demonstrate buoyancy principles using a working model.
4	**Art, Technology**	**Liquid Art Photography**	- Arranging colorful liquids for artistic expression. - Enhancing photos using digital tools.	- Students create and present artistic liquid-based projects.
5	**Physical Education, Mathematics**	**Water-Based Games & Math**	- Engaging in cooperative water activities. - Comparing	- Students improve teamwork, coordination, and mathematical reasoning.

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			densities and using fractions.	

INSTRUCTIONAL PLAN BY LESSON

LESSON Grade 3-4 Science, Engineering, Physical Education, Art (Language) and Mathematics

TIME PLAN	TEACHING & LEARNING ACTIVITIES	MATERIALS	LEARNING OBJECTIVES
INTRODUCTION **(5-10 minutes)**	Discussing **liquid properties, density, and buoyancy**.	Transparent containers, various liquids, solutes	Students learn to classify liquids.
LEARNING ACTIVITIES **(60-70 minutes)**	**Activity 1: Properties of Liquids** – Observing and recording color, density, and solubility.	**Liquids, beakers, food coloring**	Students analyze liquid behaviors.

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	Activity 2: Floating and Sinking – Predicting and testing object density.	Water containers, objects of different densities	Students apply buoyancy concepts.
	Activity 3: Submarine Principle – Building a working submarine model.	Plastic bottles, syringes, balloons	Students demonstrate density control.
	Activity 4: Liquid Art Photography – Creating and editing liquid-based images.	Smartphones, photo editing app	Students combine creativity and technology.
WRAP-UP & EVALUATION (15-20 minutes)	Reviewing concepts through discussion and group presentations.	~~Completed experiments, photos, models~~	Students summarize key ideas.

EVALUATION PLAN BY LESSON

LESSON/ACTIVITY	EVALUATION CRITERIA	EVALUATION METHOD
1	Did students correctly classify liquids?	Observation, worksheets
2	Did students predict and explain floating/sinking results?	Hands-on experiment, discussion
3	Did students successfully build a submarine model?	Project demonstration

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4	Did students create and edit liquid art photography?	Peer review, digital presentation
5	Did students engage in and complete water games?	Observation of participation

NOTES -

ACTIVITY SHEETS TO BE LINKED -

EVALUATION MATERIALS TO BE LINKED -

REFERENCES / SUPPORTING MATERIALS TO BE LINKED

PDF / PPT slides:

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