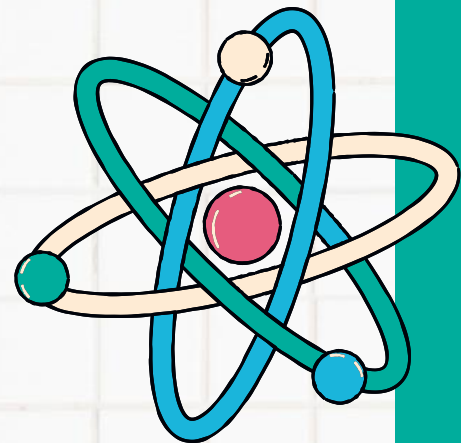
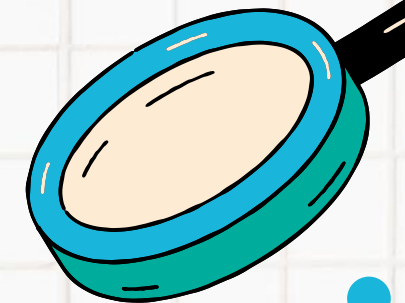
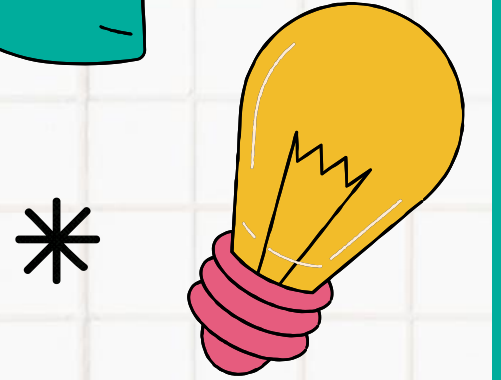
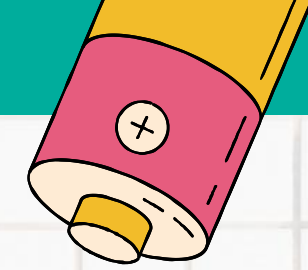
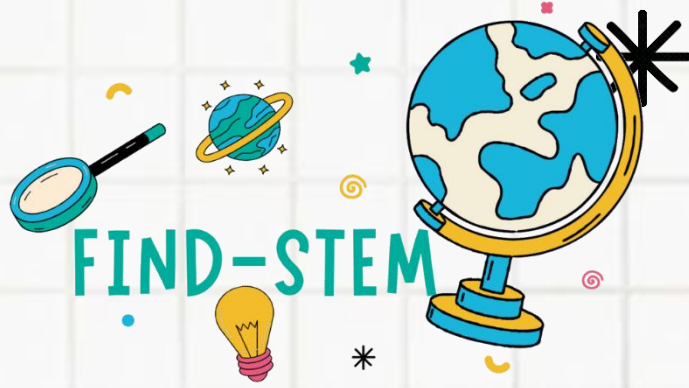
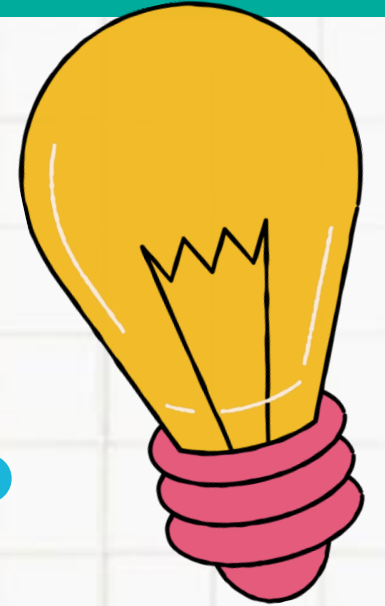


# Module 6: Assessment Strategies

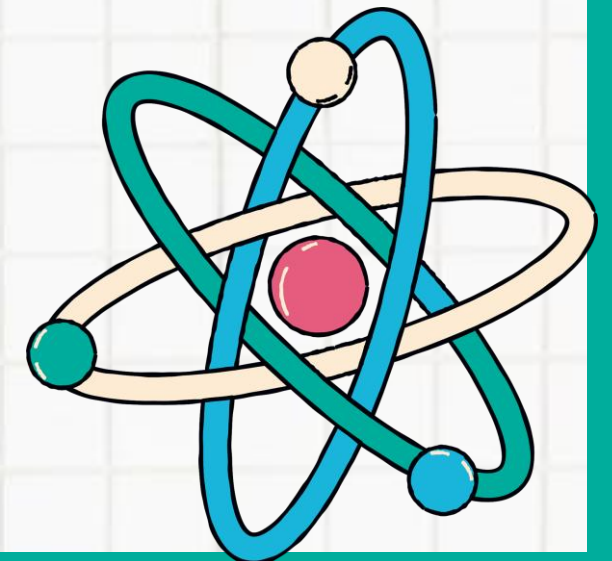


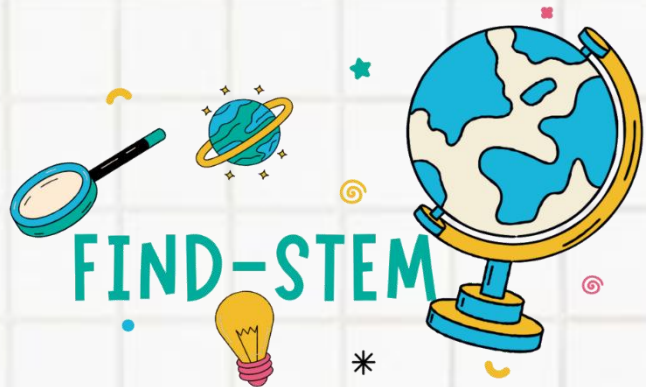


# INTRODUCTION



Effective assessment is key to measuring pupil progress and engagement in STEM. This module covers interactive and real-life-oriented assessment methods, providing teachers with tools for evaluating learning outcomes and refining their teaching strategies through reflective practices.

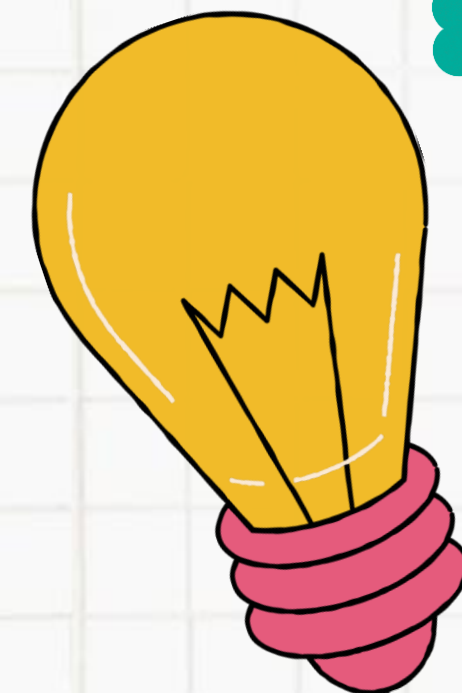




# KEY TOPICS

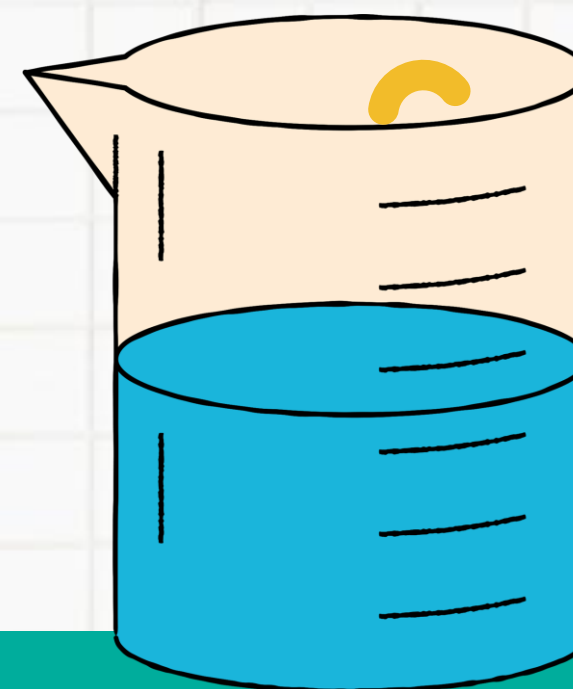
## 01

## 02

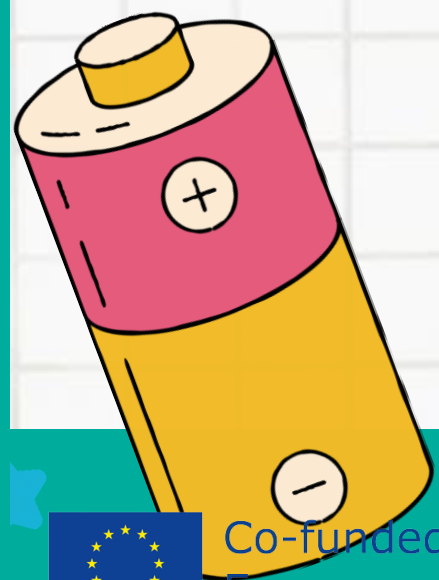


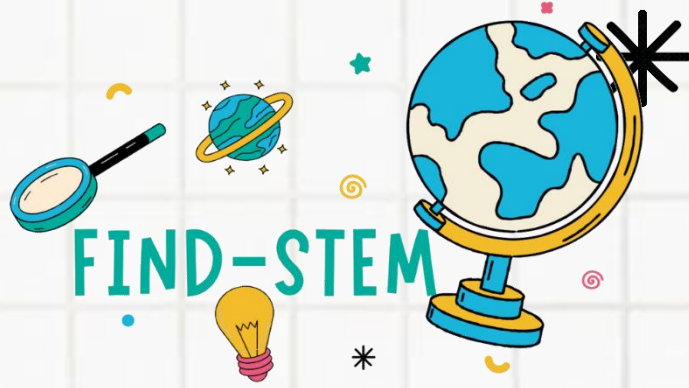
01  
Planning and executing interactive, real-life-oriented STEM lessons

02  
Assessing pupil learning and engagement in STEM subjects

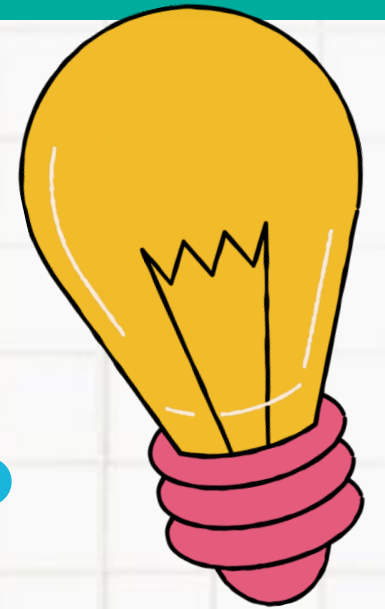


\* 03  
Reflective practices for teachers to evaluate and improve teaching strategies

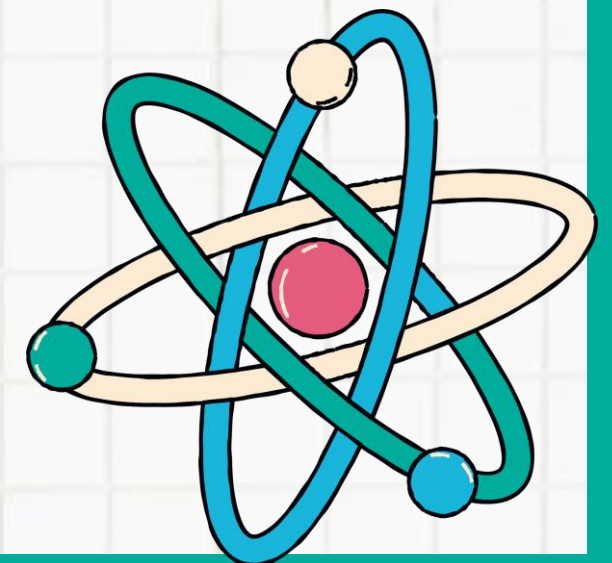


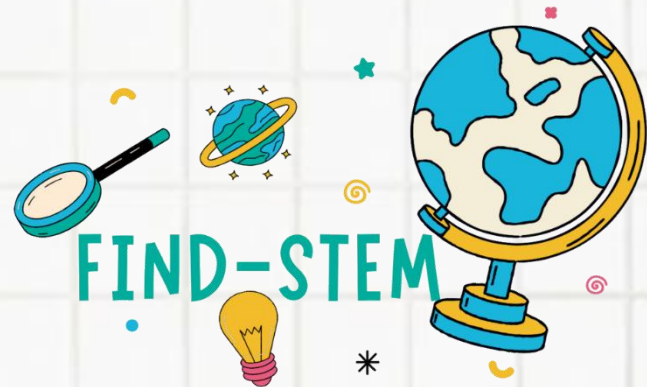


# GENERAL LEARNING OUTCOMES



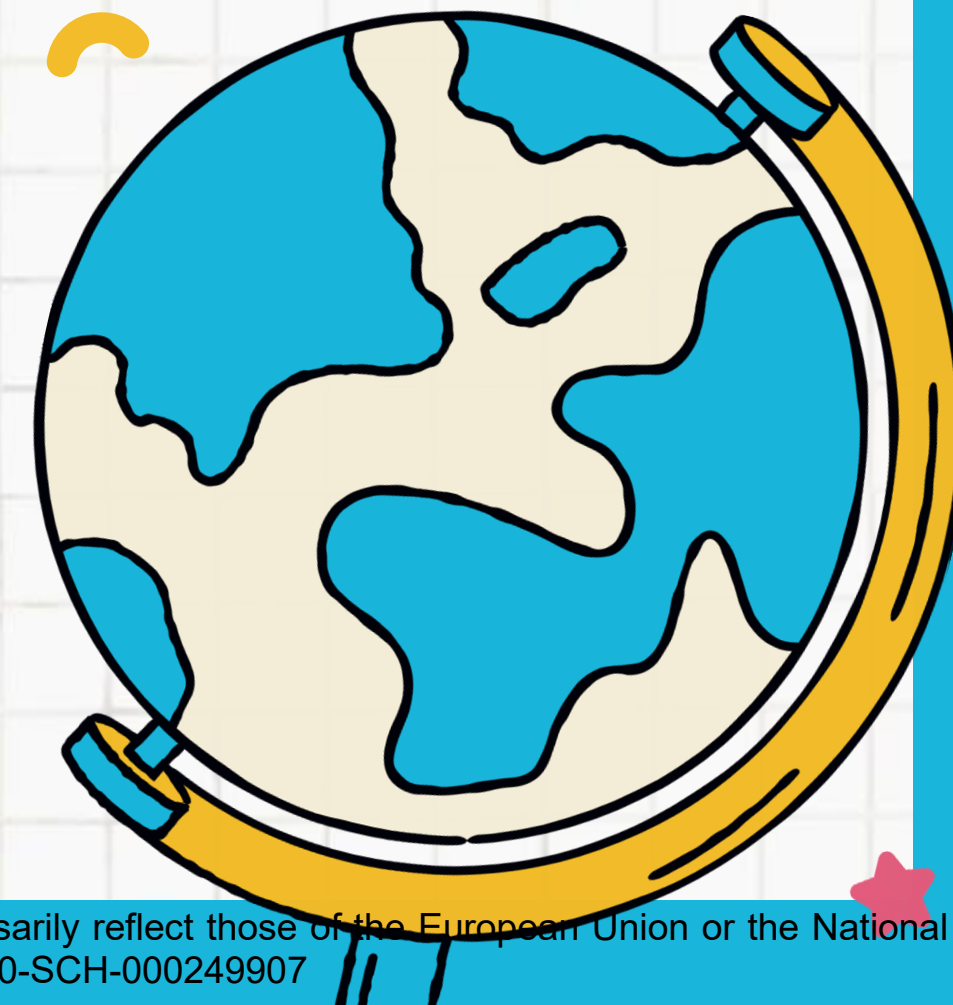
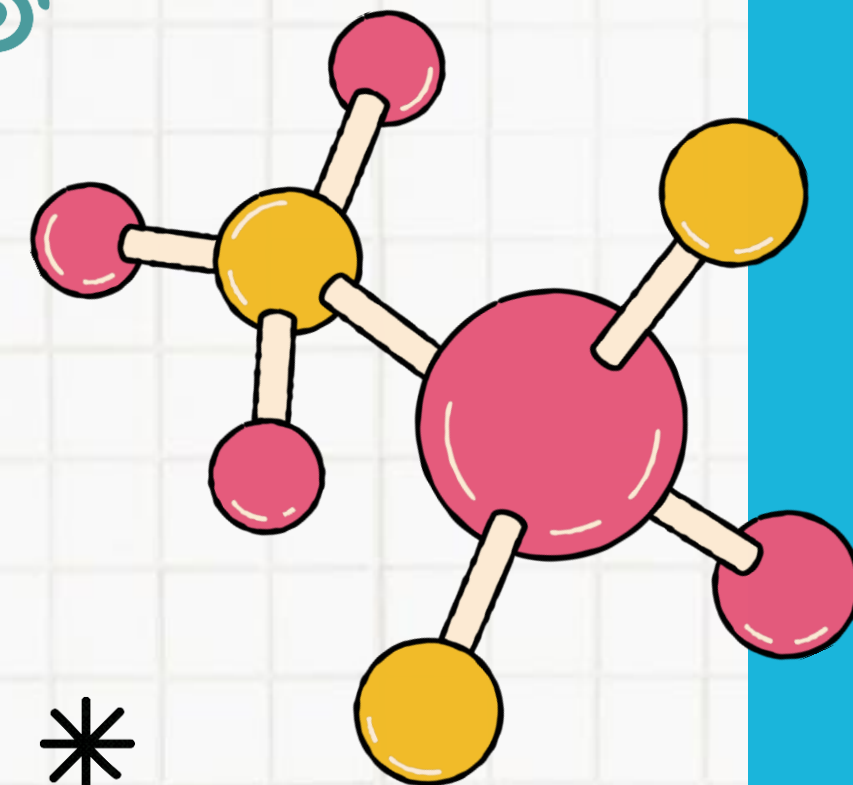
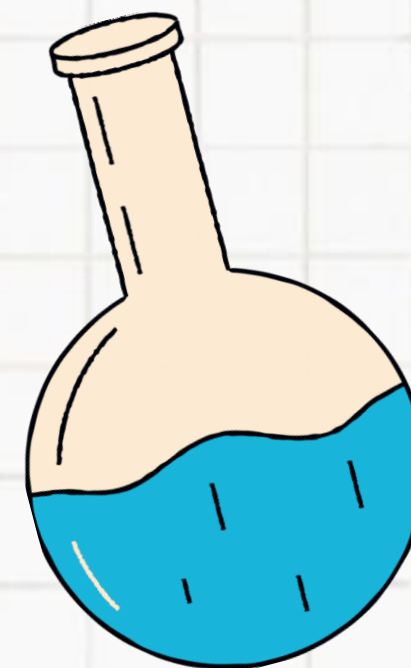
- Design and implement interactive, real-life-oriented STEM assessments to measure pupil learning effectively.
- Develop formative and summative assessment techniques that promote continuous learning and improvement.
- Utilize alternative assessment methods, such as portfolios, presentations, and peer evaluations, to capture diverse pupil strengths.
- Apply reflective teaching practices to assess and improve STEM teaching strategies for better pupil outcomes.

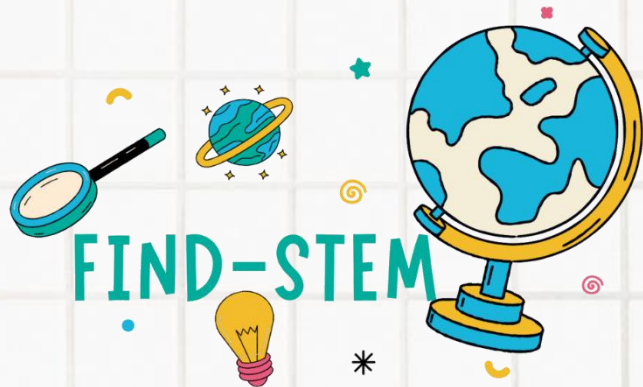




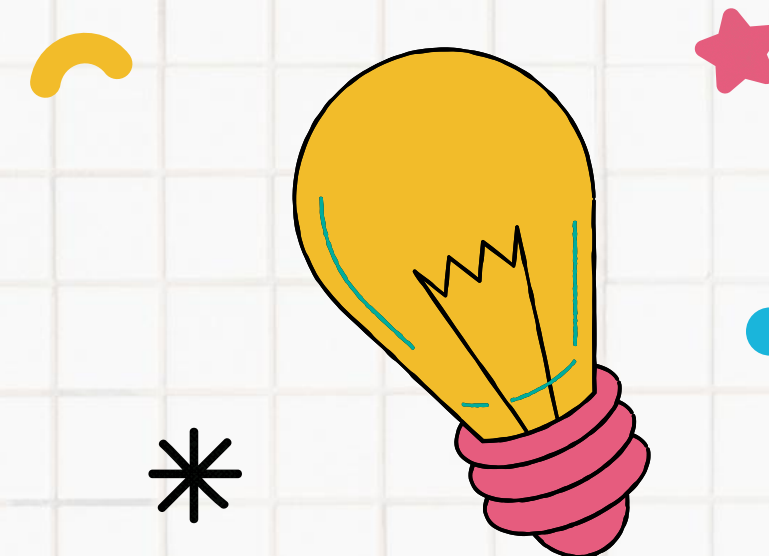
# ACTIVITY 1

**Integrating Alternative Methods into Formative  
and Summative STEM/STEAM Assessment**





# OBJECTIVES



1

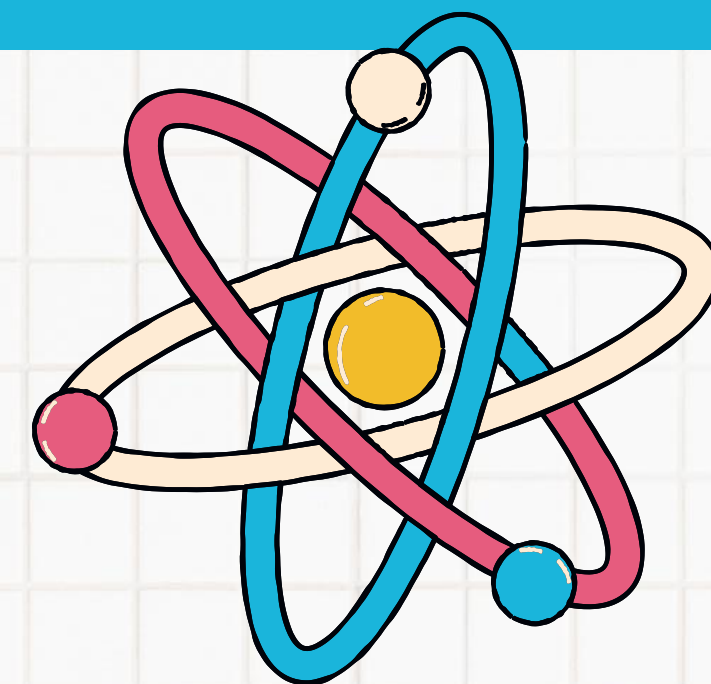
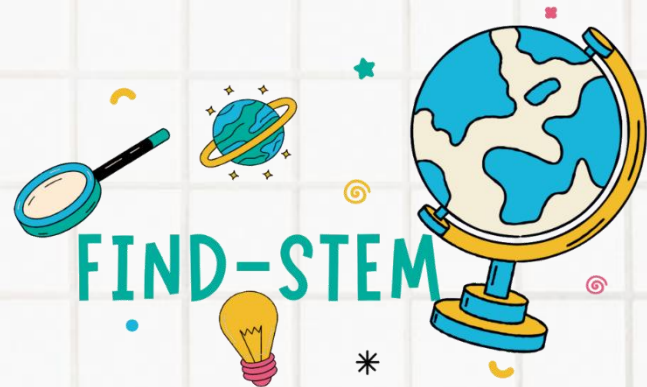
**Differentiate between formative and summative assessment techniques**

2

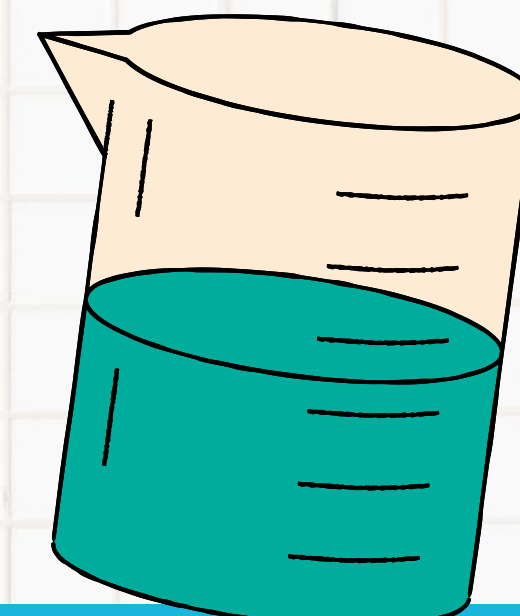
**Design an integrated assessment strategy using alternative methods**

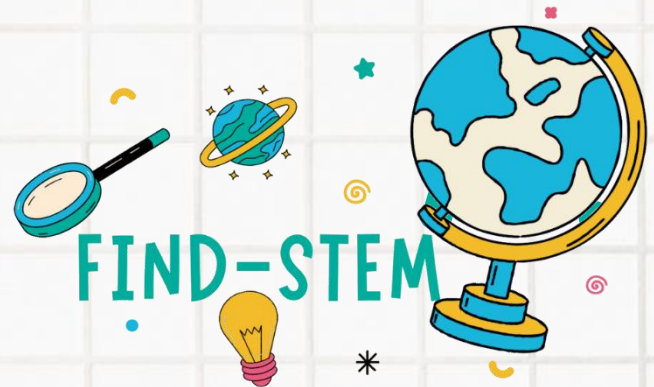
3

**Explain how these techniques promote continuous learning**

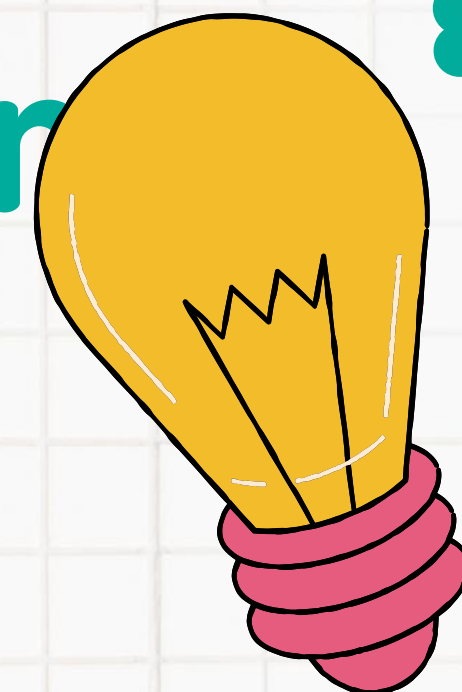


Central to effective STEM/STEAM education is the ability to assess student learning in a manner that is both comprehensive and supportive of individual growth.



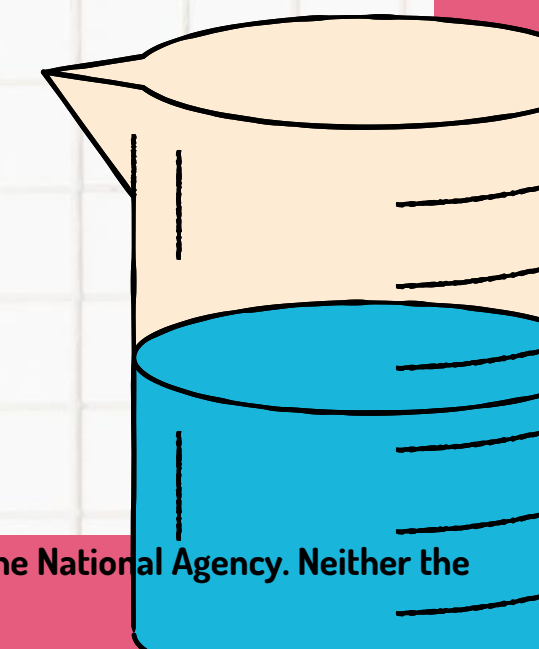
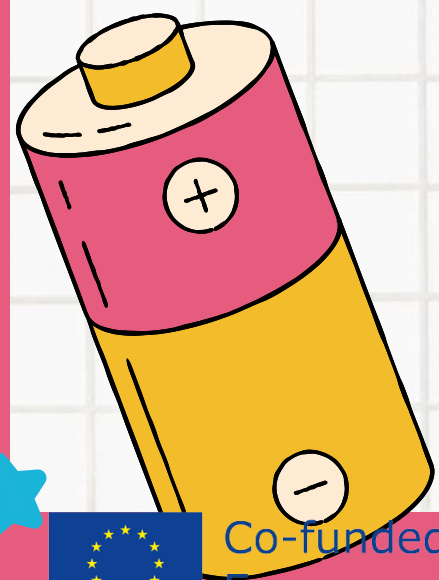


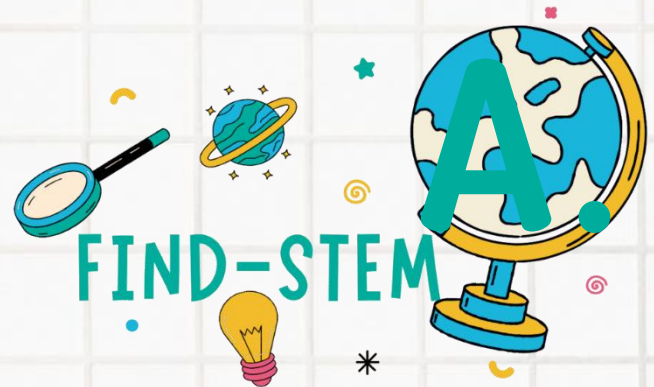
# Formative Assessment Strategies



Formative assessments are critical in shaping instruction and ensuring that students continue to build on prior knowledge.

They are not a final judgment of student performance but serve as instruments of **IMPROVEMENT** and **REFLECTION**.



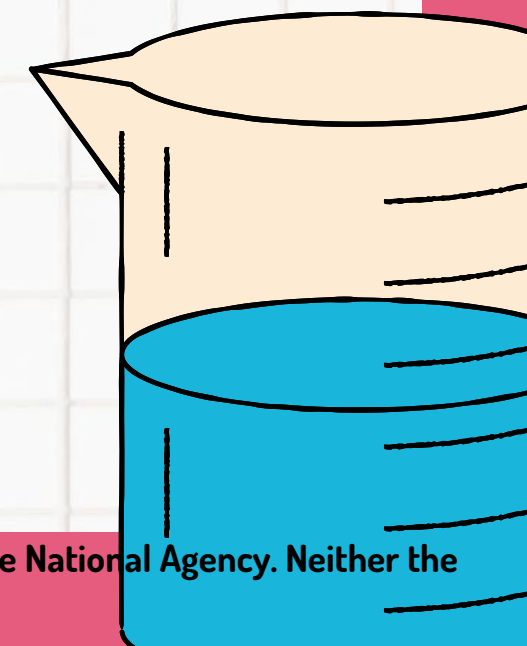
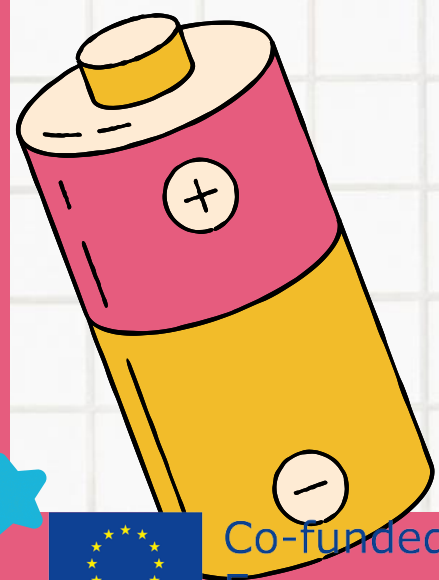


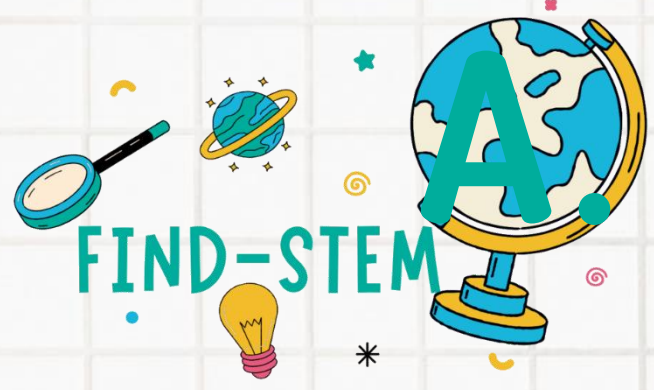
# Formative Assessment Strategies

## Characteristics and purpose

Formative assessments are designed to:

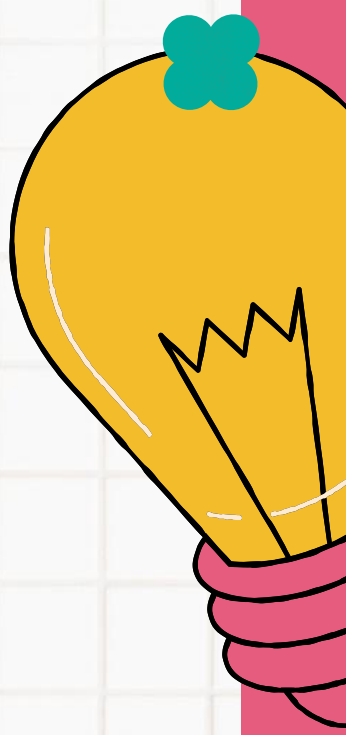
- ✓ Offer **continuous feedback** during the instructional process
- ✓ Identify and address **gaps** in student understanding
- ✓ Enable **personalized** instructional adjustments
- ✓ **Motivate** students through timely and targeted feedback



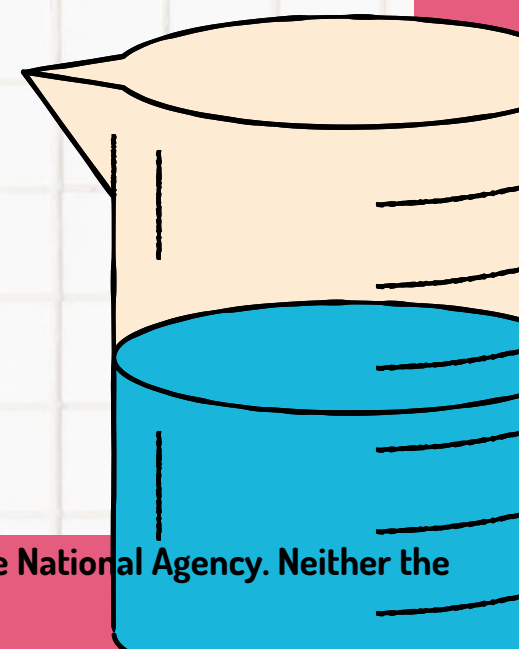
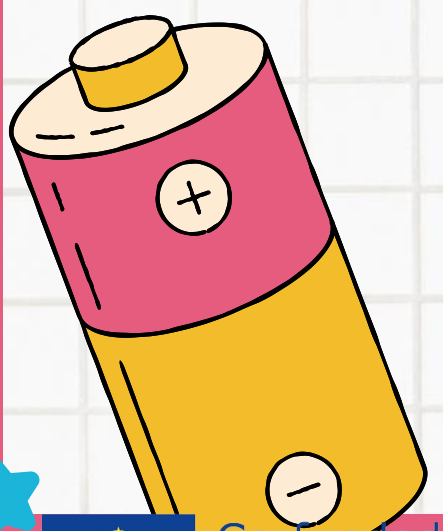


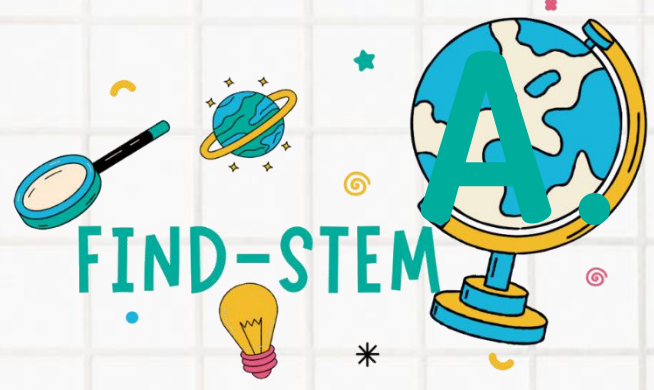
# Formative Assessment Strategies

## Comparative Table of Techniques 1/3



Formative Technique	Description	Key Benefits
Classroom Discussions	Interactive sessions where students share ideas on the spot	Immediate feedback; promotes critical thinking
Mini-Whiteboard Exercises	Students solve problems on individual boards	Quick diagnosis of understanding; low-tech

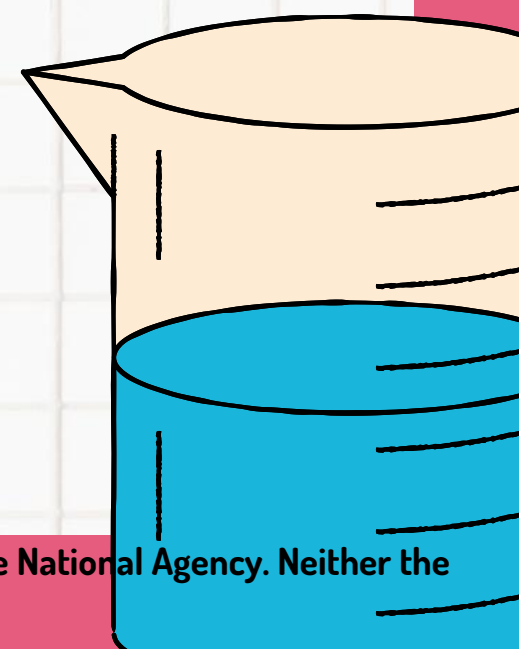
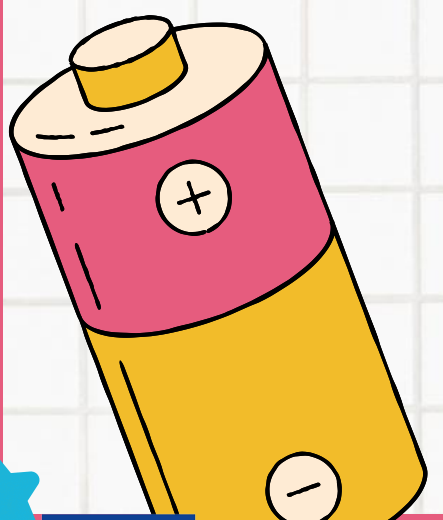


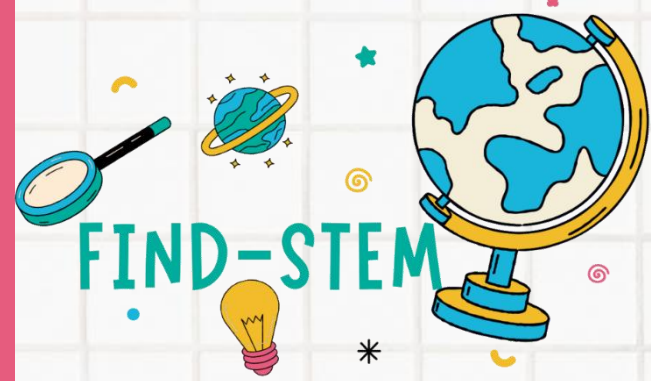


# Formative Assessment Strategies

## Comparative Table of Techniques 2/3

Formative Technique	Description	Key Benefits
Digital Quizzes and Polls	Online tools such as Google Forms for real-time assessment	Timely feedback; data organization with technology
Self-Assessment Journals	Reflective writing exercises	Encourages metacognition and personal responsibility

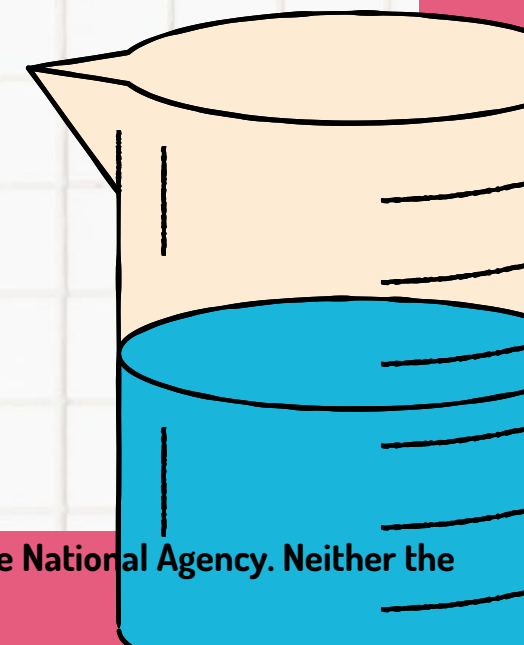
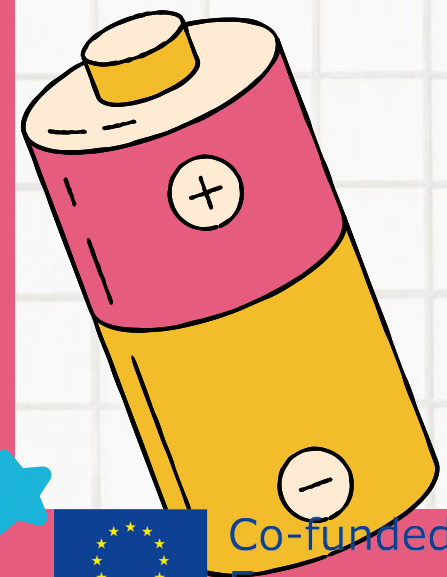


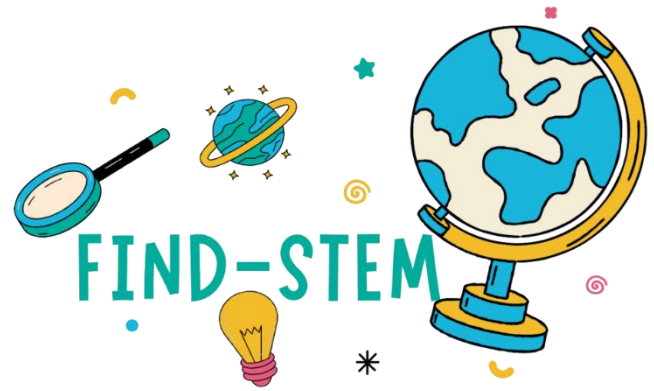


# Formative Assessment Strategies

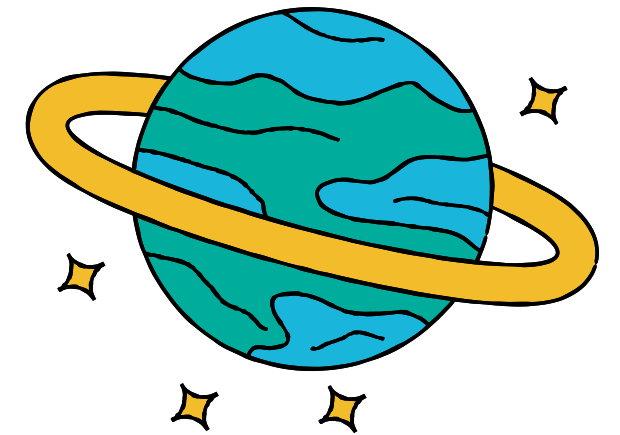
## Comparative Table of Techniques 3/3

Formative Technique	Description	Key Benefits
Peer Assessment Activities	Students review each other's work	Enhances collaborative learning; diverse feedback





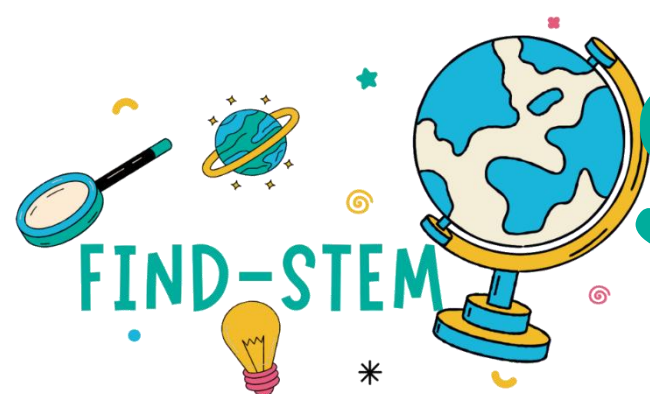
# Summative Assessment Strategies



Summative assessments evaluate the **cumulative understanding** and **skills** acquired by students.

Typically administered at the conclusion of a learning period, these assessments can be in the form of comprehensive tests, projects, or presentations.





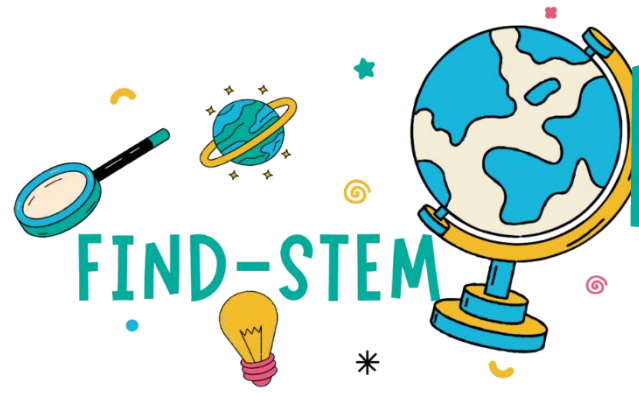
# Summative Assessment Strategies



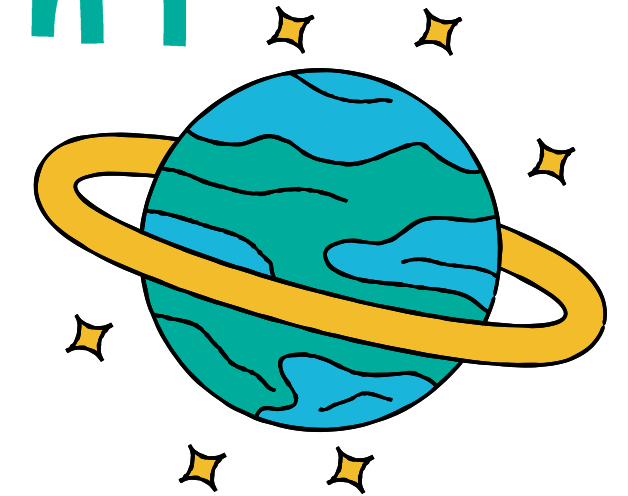
## Forms of Summative Assessments

Summative Assessment Type	Description	Key Strengths	Challenges
Standardized Tests	End-of-unit or end-of-year tests that measure cumulative understanding	Quantifiable results; broad comparability	Can induce test anxiety; may not capture all learning aspects



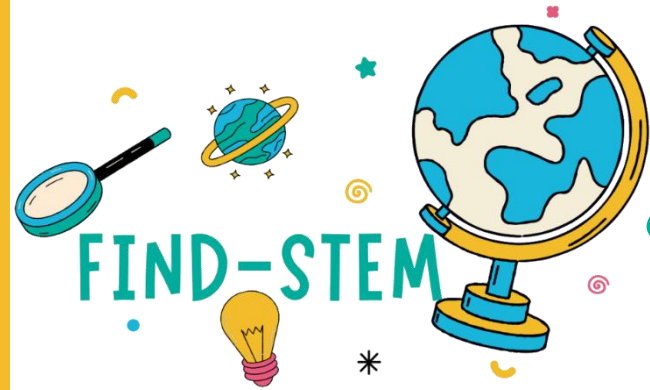


# B. Summative Assessment Strategies



## Forms of Summative Assessments 2/3

Summative Assessment Type	Description	Key Strengths	Challenges
Project-Based Assessments	Hands-on projects that involve designing experiments or solving real-world problems	Integrates theory and practice; fosters creativity	Time-intensive; subjective grading may occur



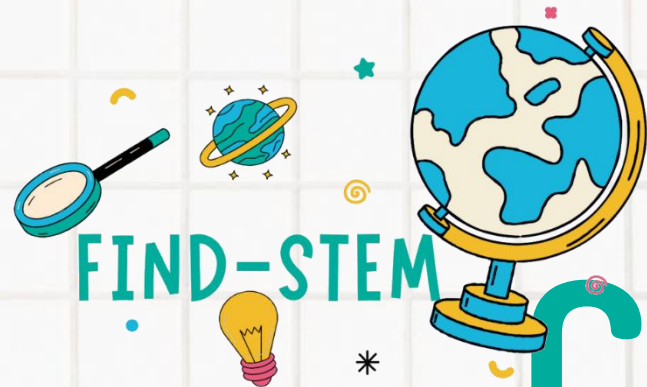
# Summative Assessment Strategies



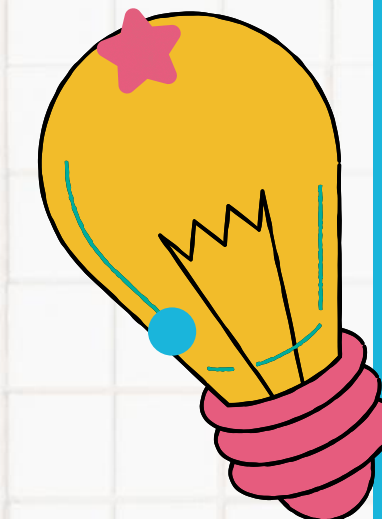
## Forms of Summative Assessments

Summative Assessment Type	Description	Key Strengths	Challenges
Presentations/ Exhibitions	Public presentations of projects and learning outcomes	Encourages public speaking; engages community	Requires significant planning and coordination

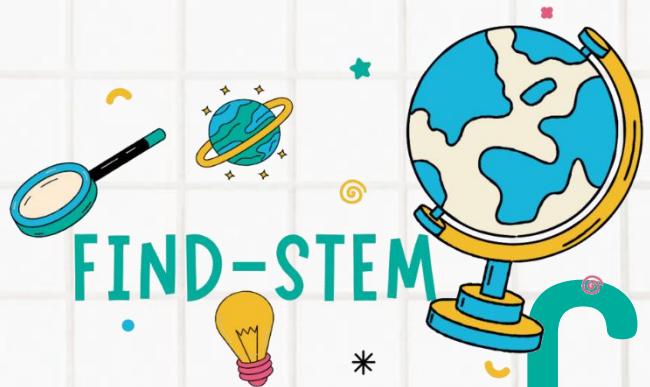




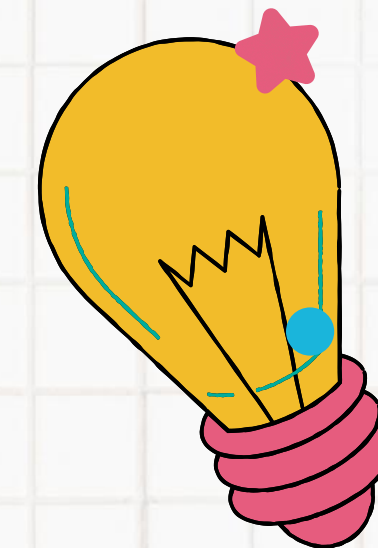
# Comparing Formative and Summative Evaluation \*



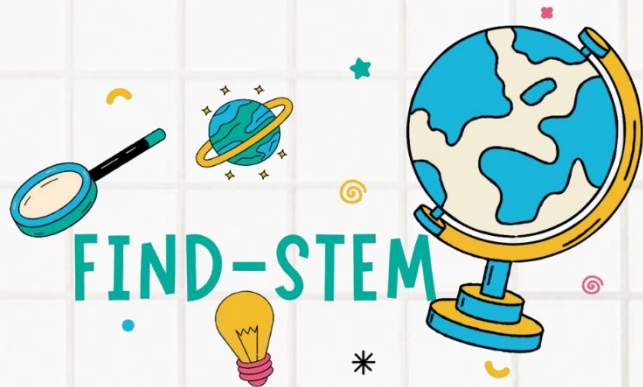
Feature	Formative Assessment	Summative Assessment
Purpose	Improve learning	Evaluate learning
Timing	During instruction	End of unit/term
Feedback	Immediate, guides improvement	Delayed, summarizes achievement
Impact on Grade	Low or no impact	High impact



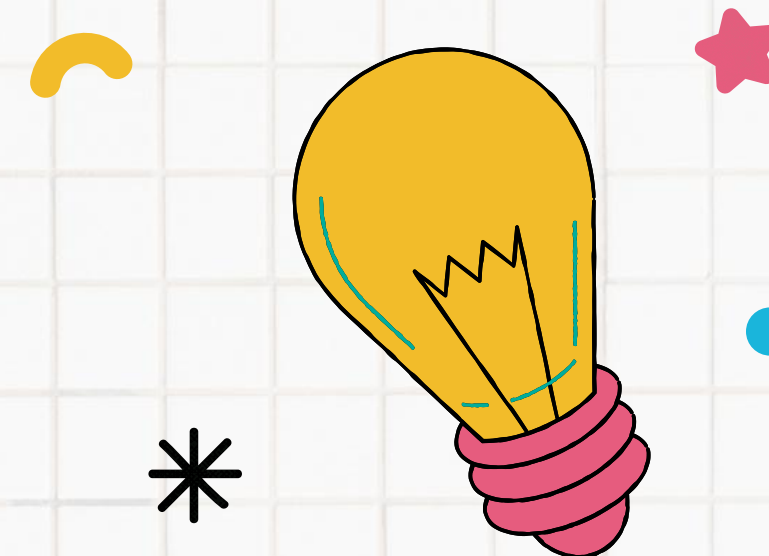
# Comparing Formative and Summative Evaluation \*



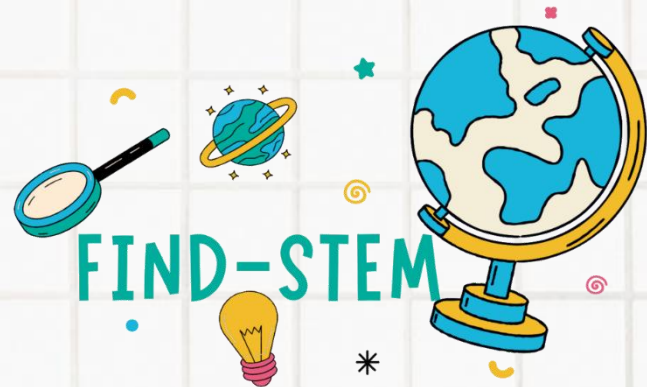
Feature	Formative Assessment	Summative Assessment
Purpose	Improve learning	Evaluate learning
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Feedback	Immediate, guides improvement	Delayed, summarizes achievement
Impact on Grade	Low or no impact	High impact



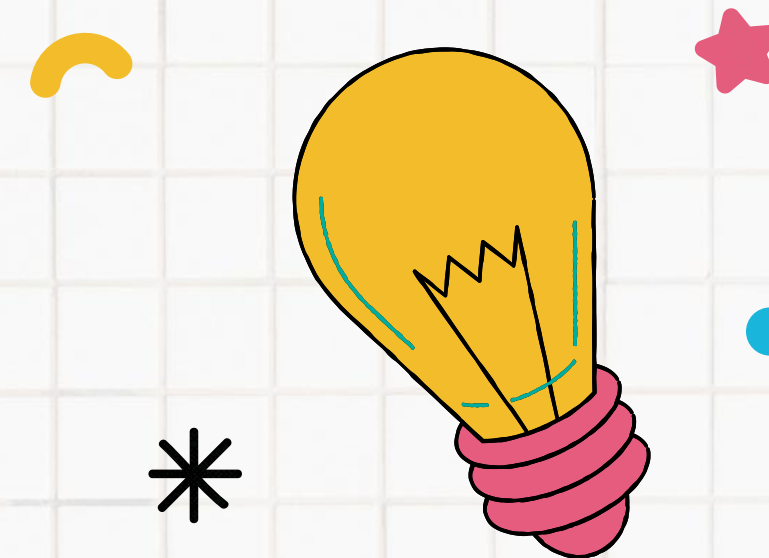
# Jigsaw Activity



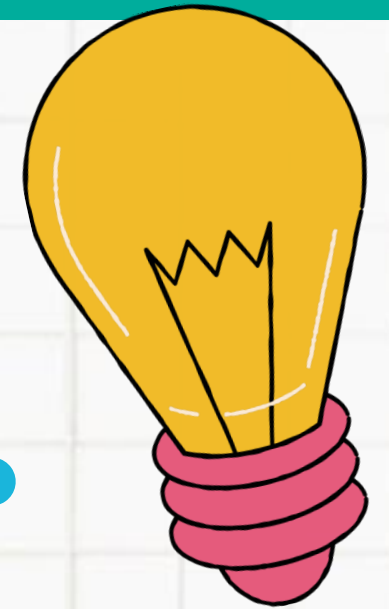
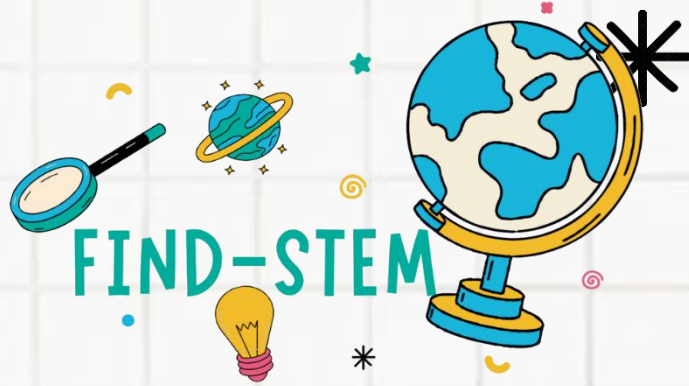
- Form three "expert" groups: Portfolios, Presentations, Peer Evaluations.
- Each group discusses best practices and challenges of their assigned method.
- Re-form groups with one member from each expert group.
- Each group designs an integrated assessment strategy for a specific unit, incorporating at least one alternative method.



# Jigsaw Activity



- Each group briefly shares their assessment strategy.
- Highlight how alternative methods capture diverse pupil abilities.



# Additional Resources

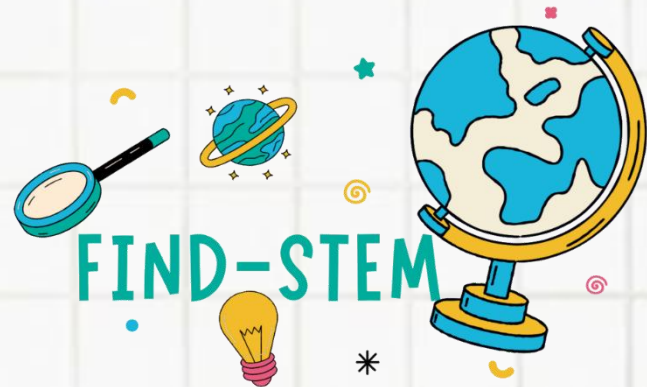
Formative vs Summative Assessment:

<https://www.niu.edu/citl/resources/guides/instructional-guide/formative-and-summative-assessment.shtml>

Formative Assessment in Hands-On STEM Education:

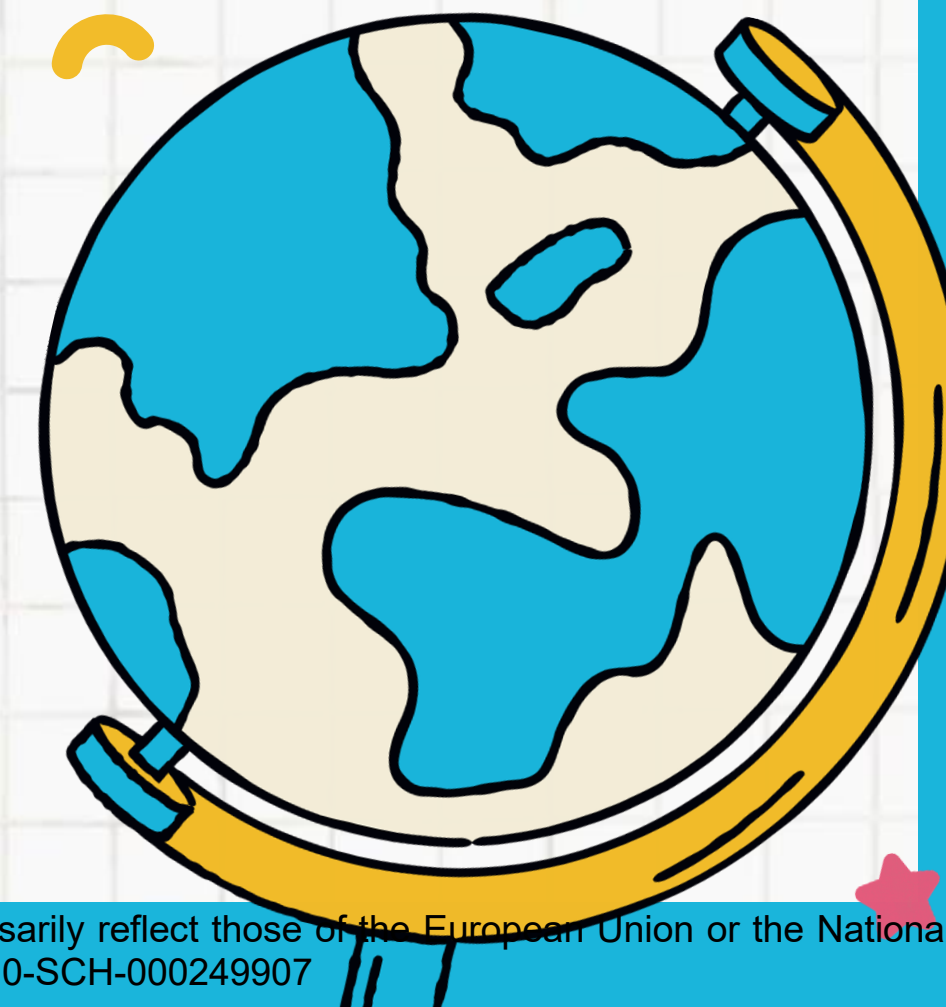
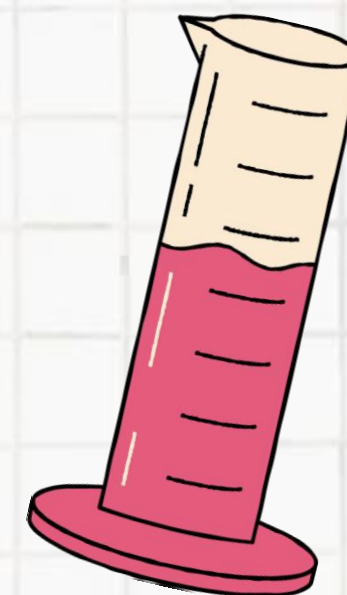
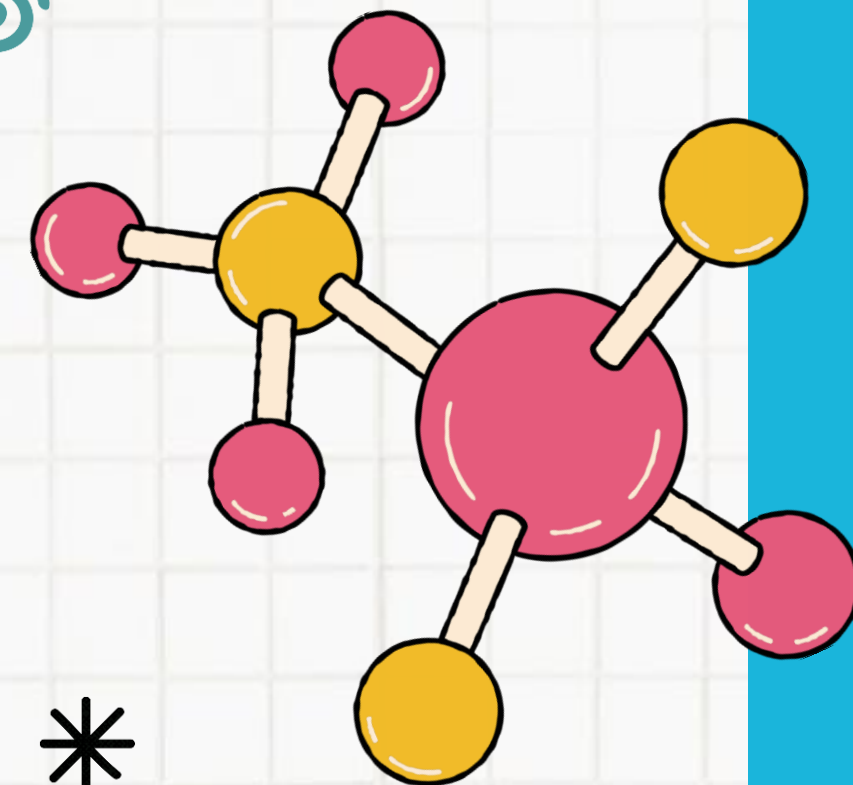
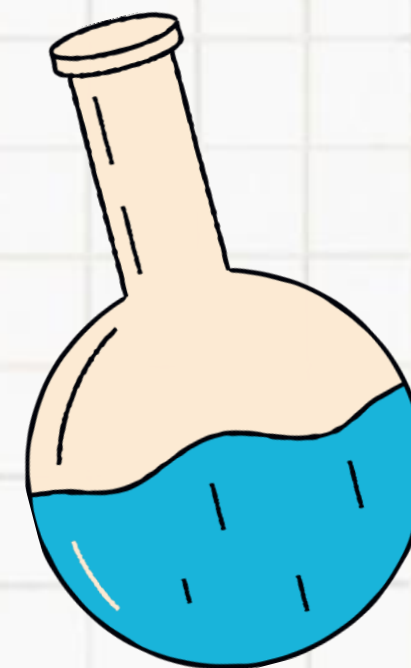
[https://www.researchgate.net/publication/382556368\\_Formative\\_Assessment\\_in\\_Hands-On\\_STEM\\_Education](https://www.researchgate.net/publication/382556368_Formative_Assessment_in_Hands-On_STEM_Education)

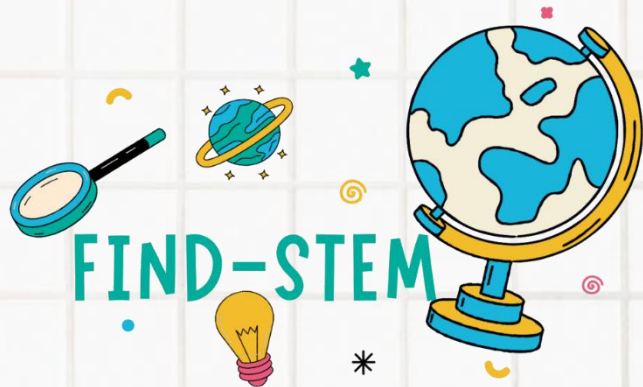




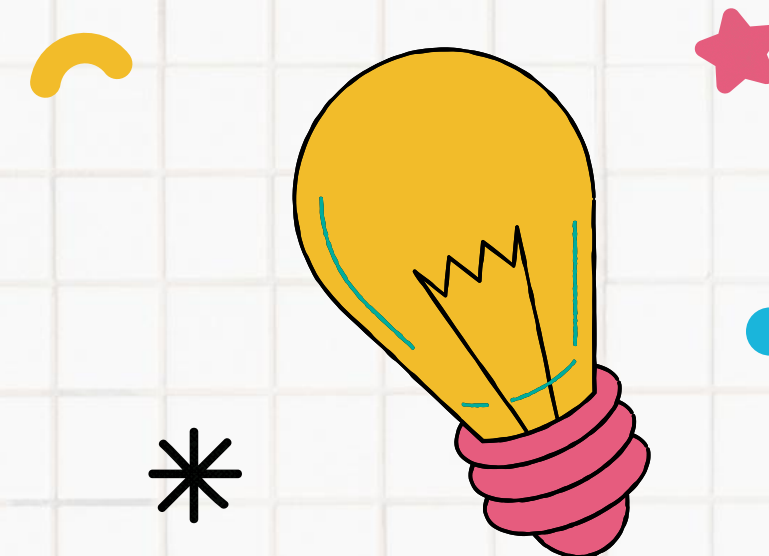
# ACTIVITY 2

**Integrating Technology in STEM/STEAM  
Assessments – Transforming how we  
Understand Student Learning**





# OBJECTIVES



1

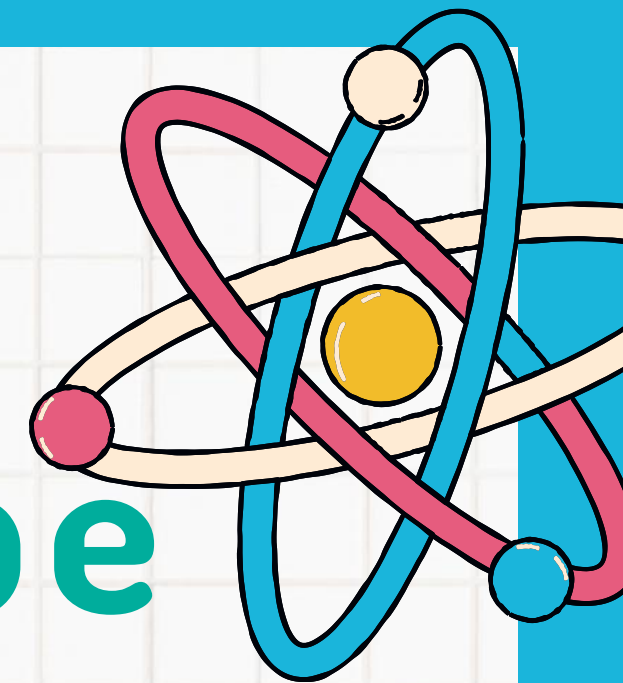
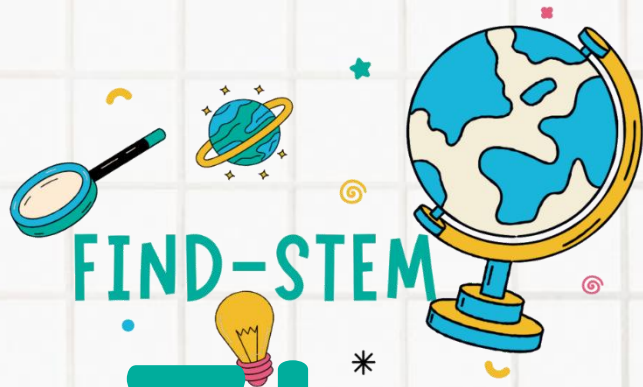
**Redesign traditional STEM/STEAM assessments using technology to enhance engagement, collaboration, and accessibility**

2

**Apply digital tools to provide immediate, personalized feedback and support inclusive participation**

3

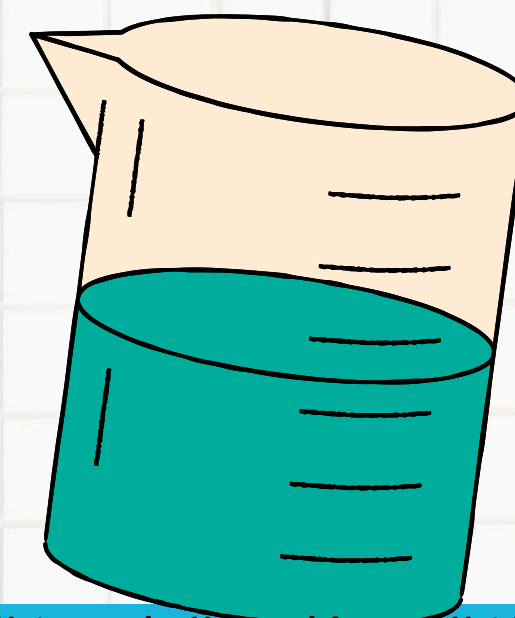
**Utilize technology for data collection and analysis to inform instruction and improve learning outcomes**

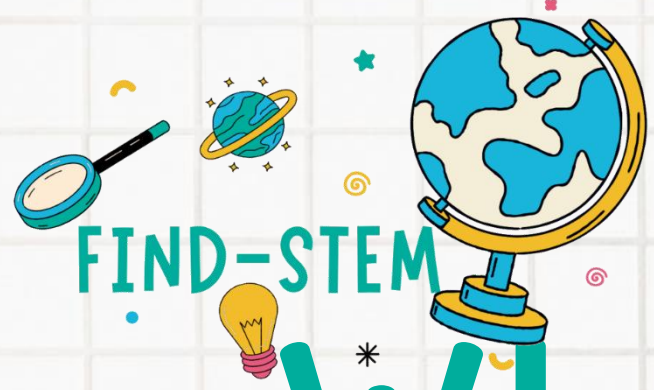


# The Assessment Landscape

- "interactive" as involving active participation and collaboration .
- "real-life-oriented" as connecting to pupils' experiences and relevant contexts .

Example: Instead of a worksheet on fractions, pupils plan a bake sale, calculating ingredient costs and profits .



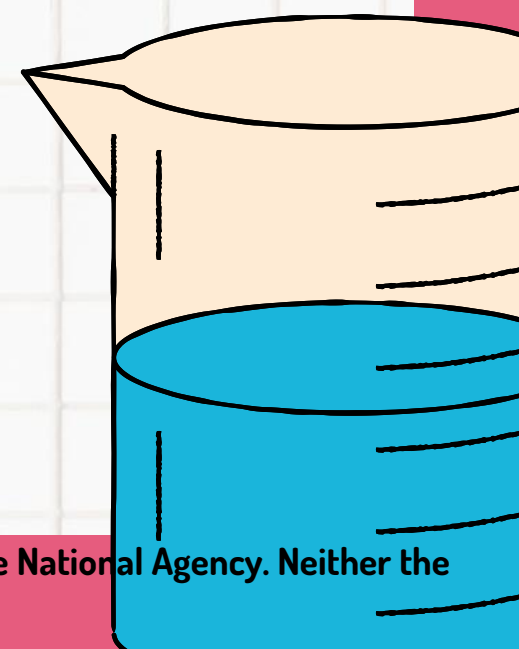
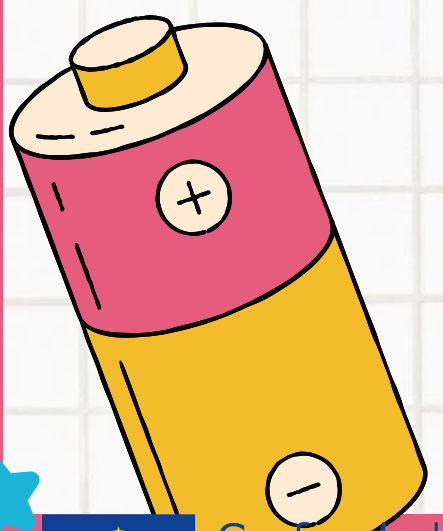


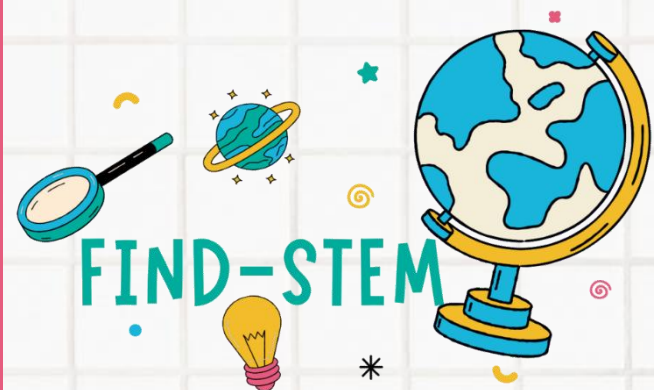
FIND-STEM

# Why Integrate Technology?

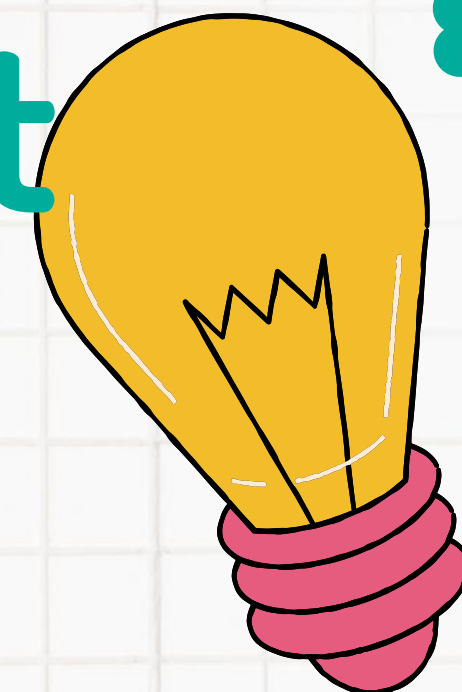


- ✓ Increased Engagement
- ✓ Personalized Feedback
- ✓ Real-Time Data
- ✓ Accessibility & Inclusivity
- ✓ Efficiency (Reduced Teacher Workload)

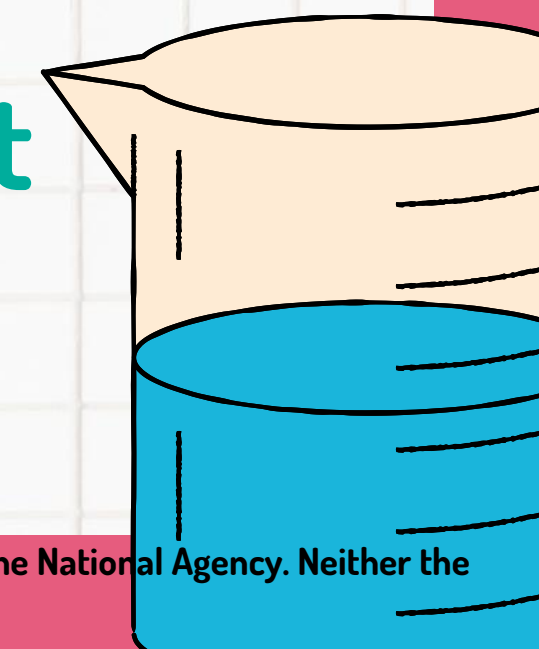
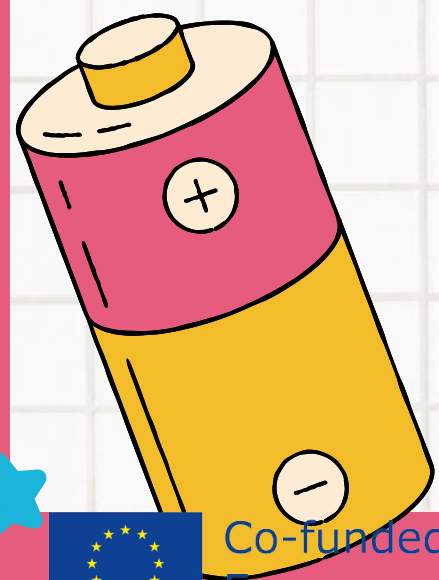


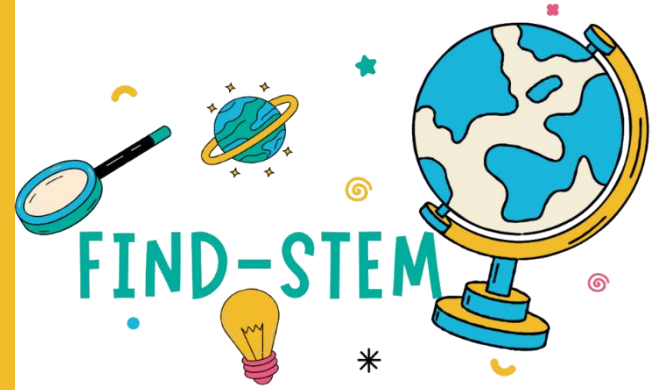


# Formative Assessment Tools

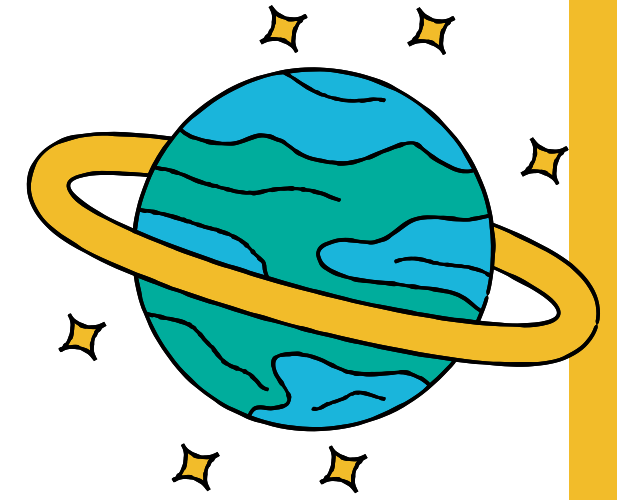


- ✓ **Plickers: Quick check for understanding**
- ✓ **Google Forms: Quizzes, polls, and surveys**
- ✓ **Nearpod: Interactive lessons and assessments**
- ✓ **Flipgrid: Video-based discussions**
- ✓ **WAYGROUND: Gamified learning**
- ✓ **Superlame and Voki as creative tools for student expression**



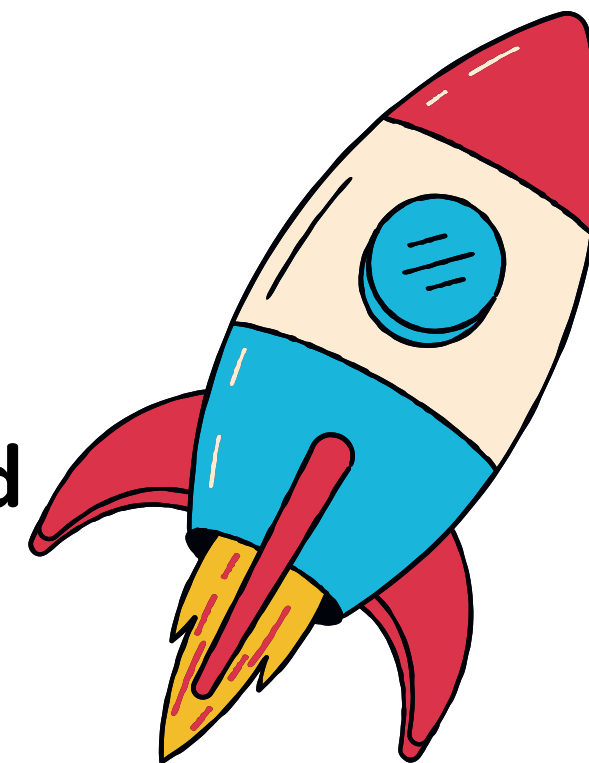


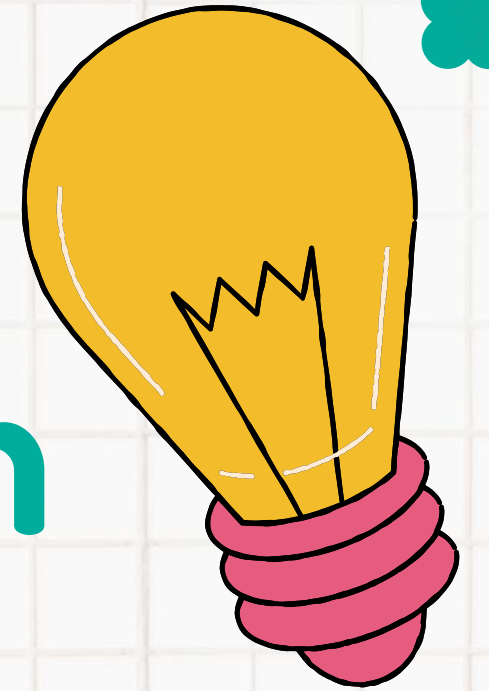
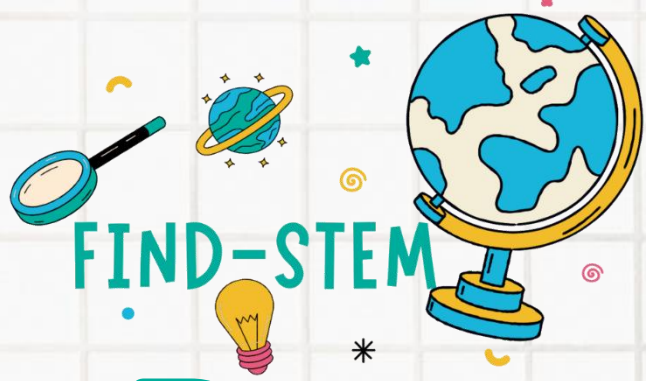
# Summative Assessment: A Digital Upgrade



Technology can enhance summative assessments (e.g., multimedia projects, online exams).

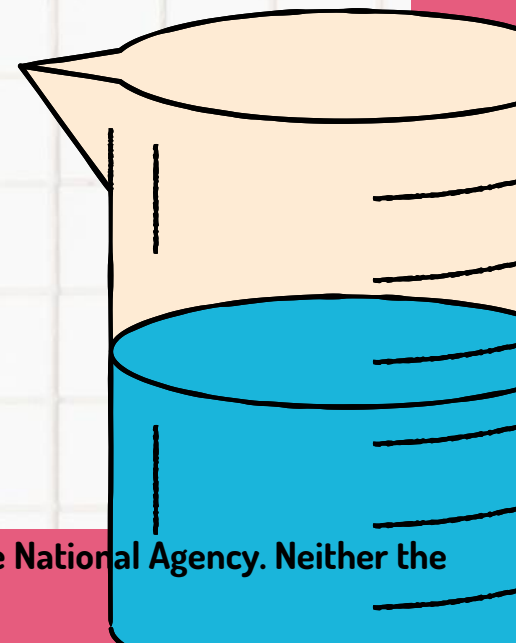
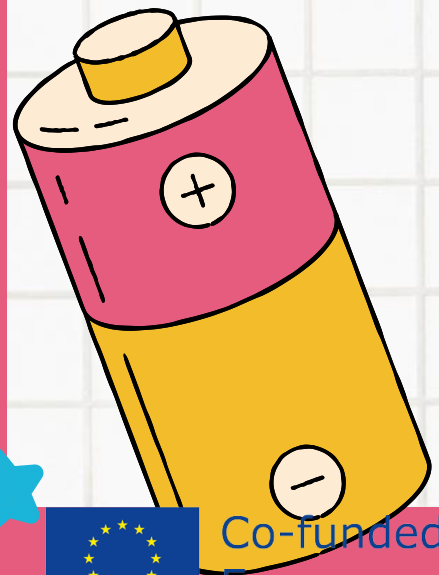
The importance of scaffolding project-based learning

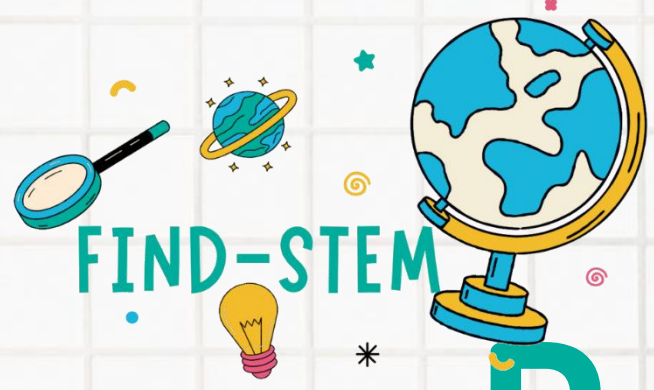




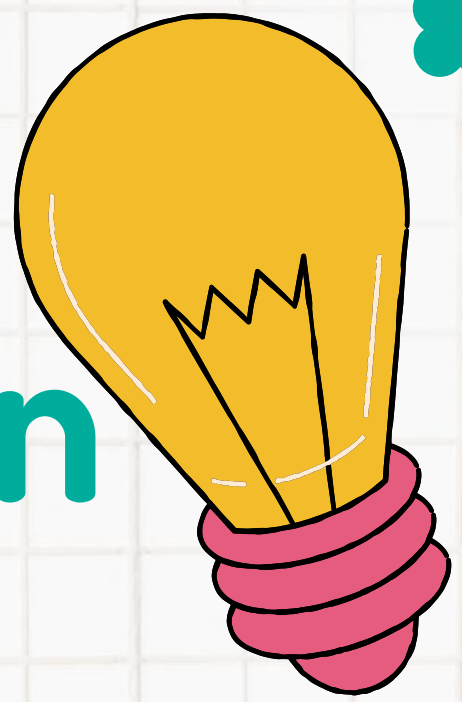
# Promoting Inclusivity with Tech

- ✓ **Anonymous responses**
- ✓ **Audio/video submissions**
- ✓ **Accessibility features (screen readers, etc.).**

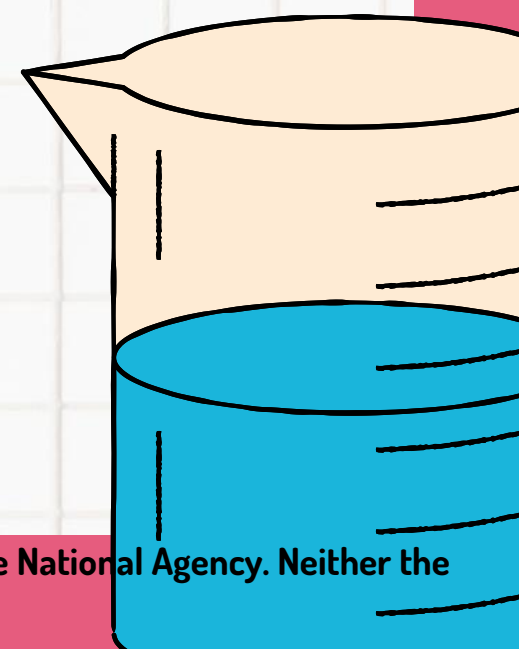
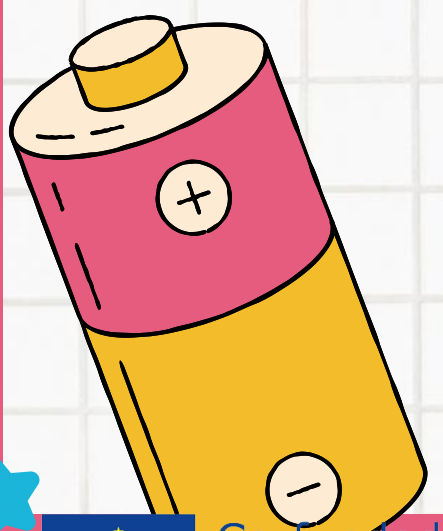


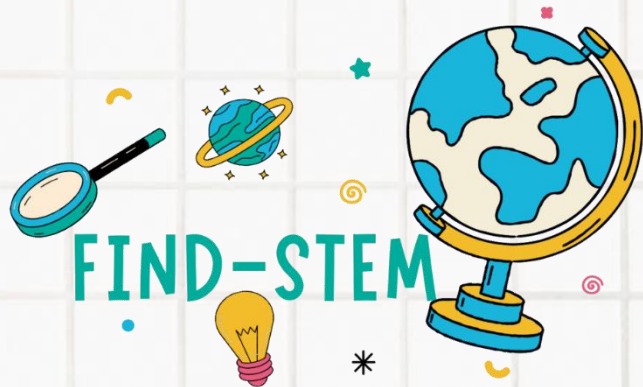


# Data-Driven Instruction



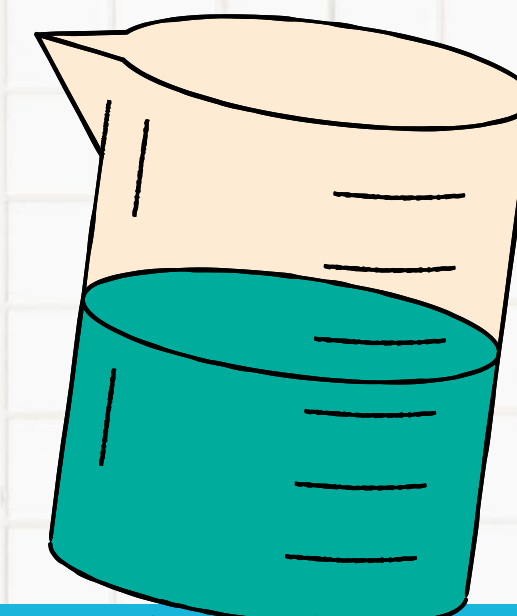
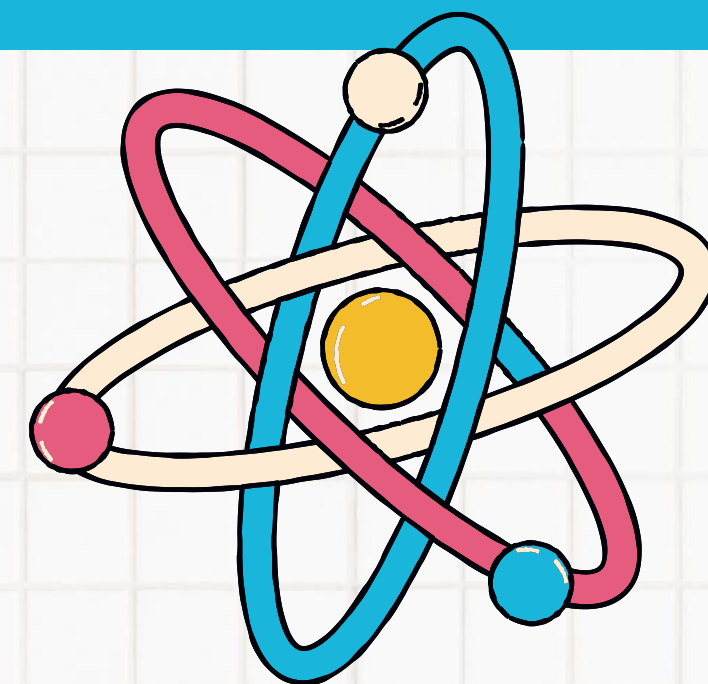
- ✓ How to use assessment data to inform instructional decisions.
- ✓ The importance of adjusting teaching based on student needs

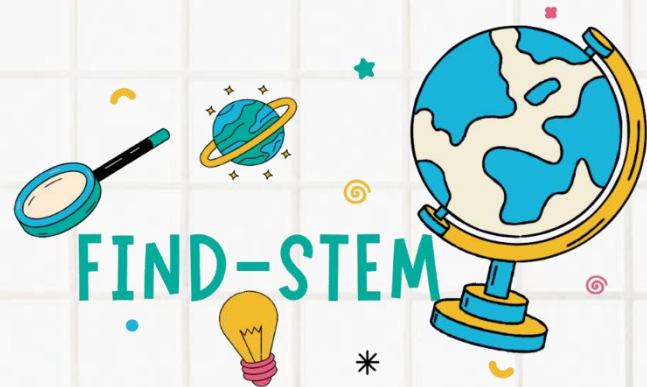




# Challenges and Considerations

- Digital equity (access to technology)
- Teacher training and support
- Data privacy and security



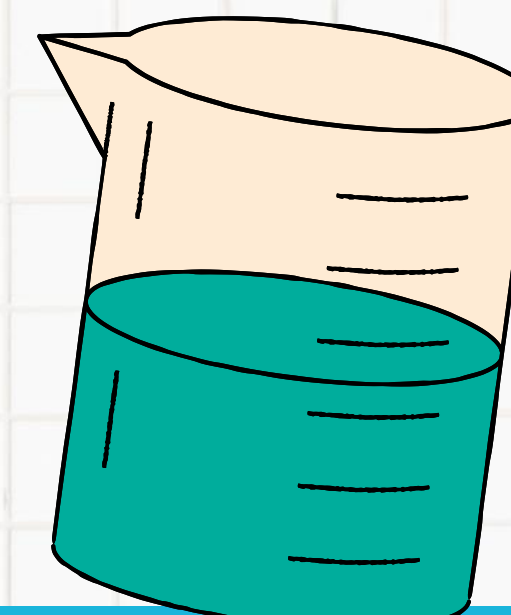
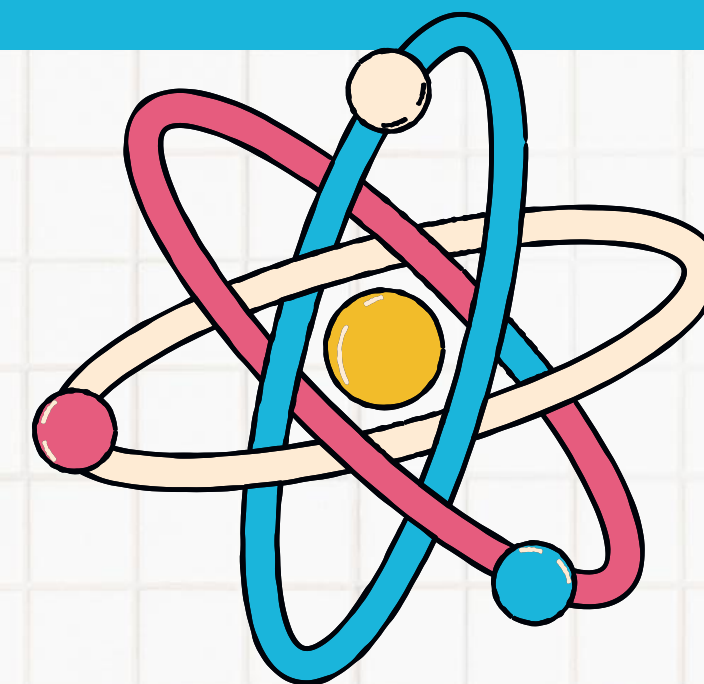


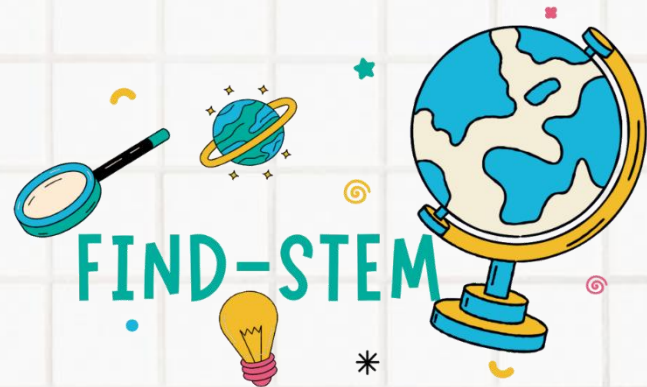
# Activity Time!

## Digital Tech-Enhanced Assessment Makeover

**Objective:** You will brainstorm and redesign a traditional STEM/STEAM assessment using technology

**Materials:** Chart paper or whiteboard, markers, laptops/tablets (optional).



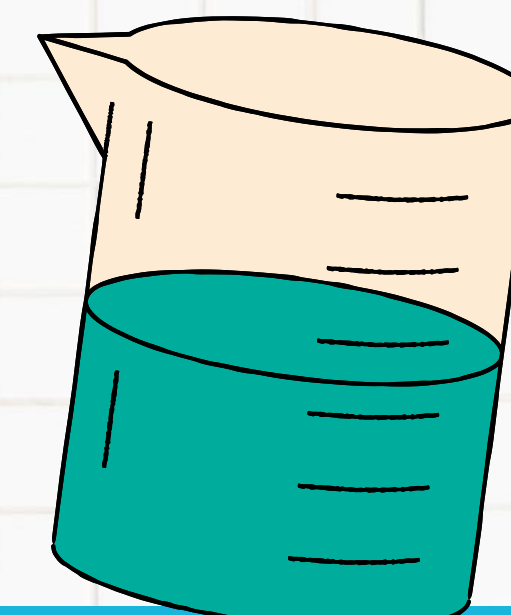
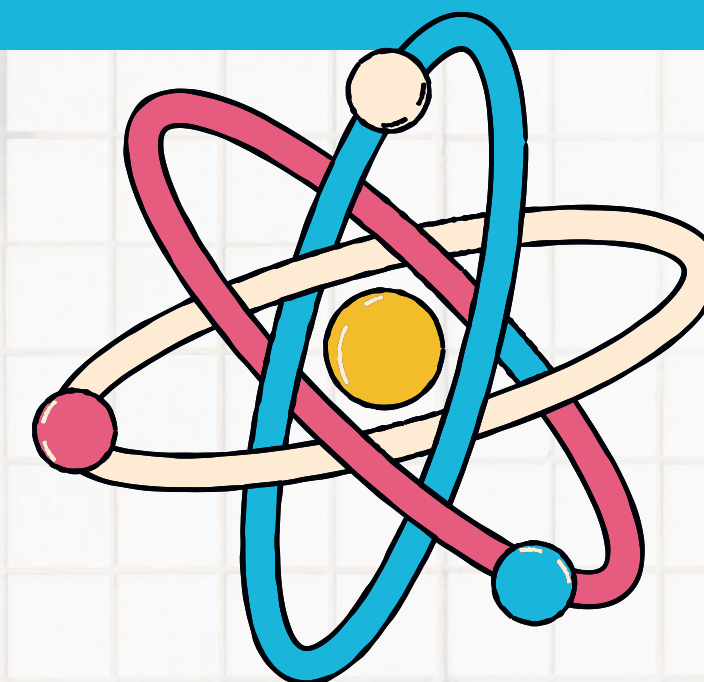


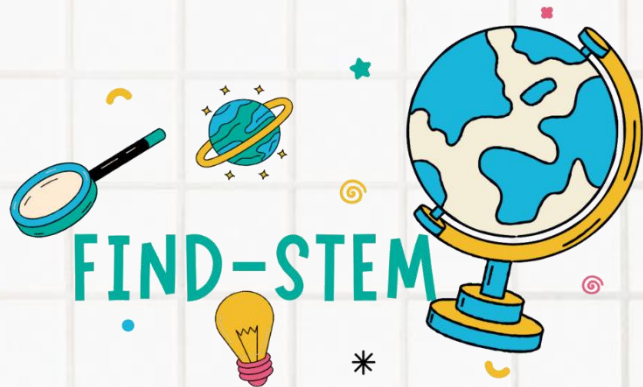
# Activity Time!

## Digital Tech-Enhanced Assessment Makeover

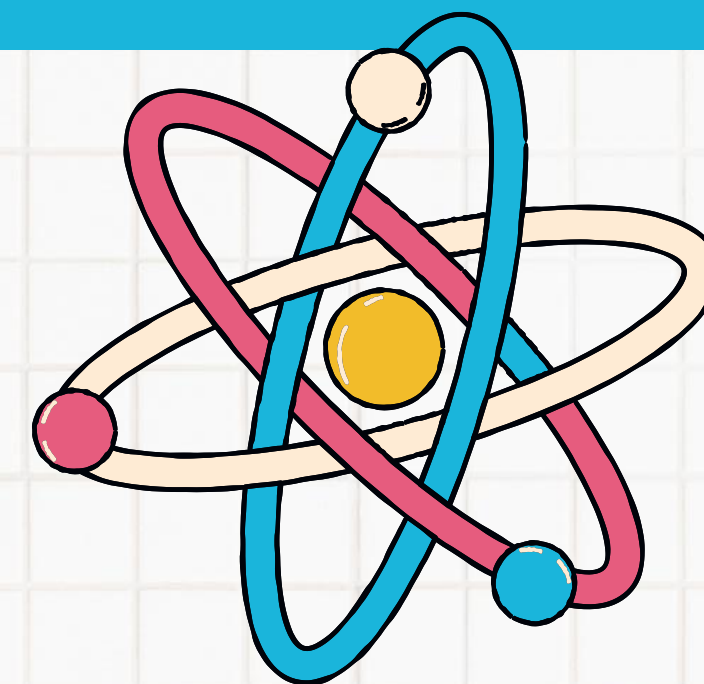
### Procedure:

1. **Small Group Formation:** Divide into small groups (3-4 teachers).
2. **Traditional Assessment Identification:** Each group identifies a traditional STEM/STEAM assessment they currently use (e.g., a worksheet, a lab report, a presentation).





# Activity Time!



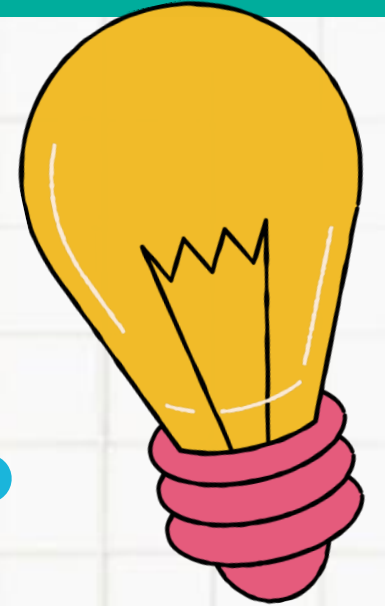
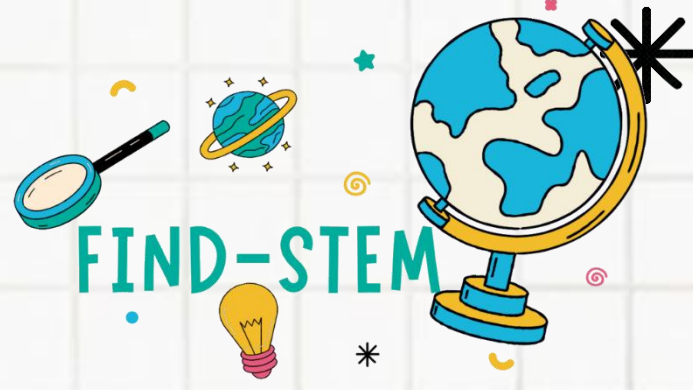
## Digital Tech-Enhanced Assessment Makeover

Procedure:

**3, Tech-Enhanced Redesign: Groups brainstorm ways to enhance this assessment using technology. Encourage them to consider:**

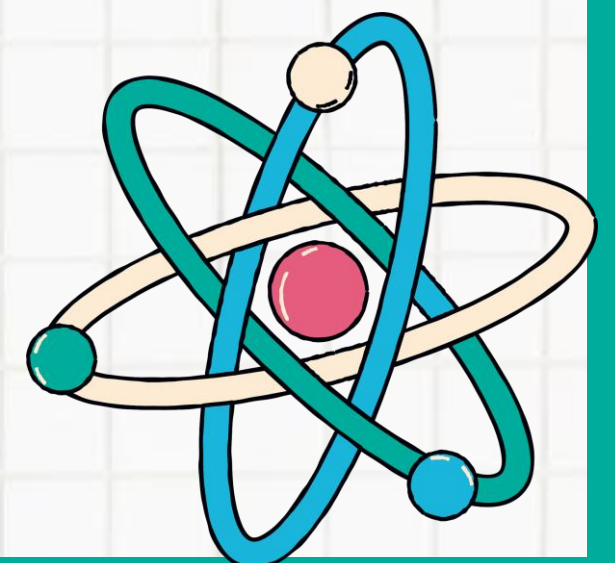
- **Formative Feedback:** How can technology provide more immediate and personalized feedback?
- **Engagement:** How can technology make the assessment more engaging and interactive? Consider educational games and tools to encourage collaboration.
- **Accessibility:** How can technology make the assessment more accessible and inclusive (e.g., audio responses, anonymous participation)?

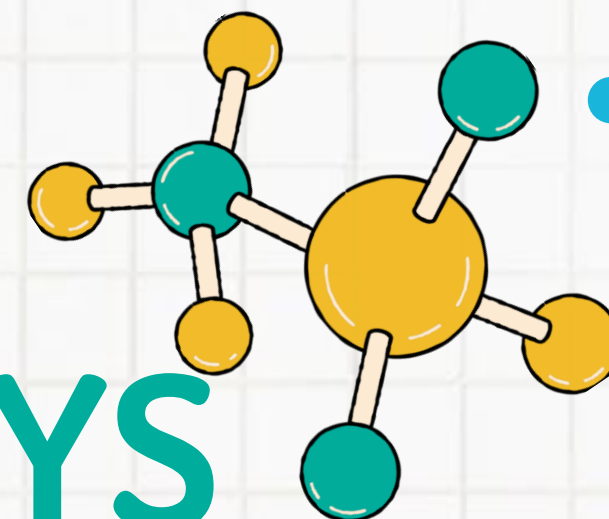
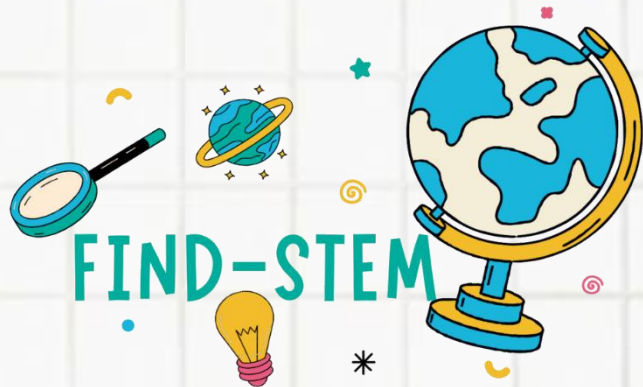




# Additional Resources

Digital Education Tools Guide for Teachers and Students: <https://www.nwea.org/blog/2024/75-digital-tools-apps-teachers-use-to-support-classroom-formative-assessment/>





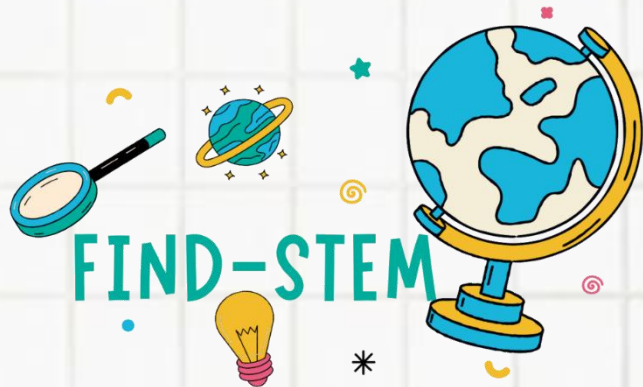
# SUMMARY OF KEY TAKEAWAYS

1/2

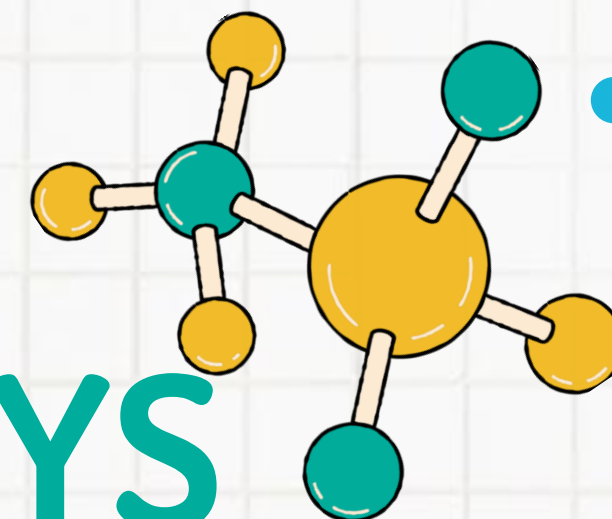
**1. Importance of Varied Assessment Types:** A key takeaway is the need to understand and implement different assessment types, including baseline, formative, and summative assessments;

**2. Collaborative and Student-Created Assessments:** The module emphasizes the value of collaborative and student-created assessments to foster motivation and deeper understanding.

**3. Blended Assessment Formats:** Utilizing both physical and online formats for exhibitions and presentations of learning is encouraged to cater to different learning styles and technological capabilities.



# SUMMARY OF KEY TAKEAWAYS



2/2

**4. Assessment for Reflection:**  
Classroom assessment strategies should incorporate reflection to enhance teaching effectiveness;

**5. Hands-on activities** Encouraging the use of hands-on activities to promote active learning and deeper content understanding is seen as vital for engaging students in STEM.



# End of Module 6

Any questions? Don't hesitate to  
ask for our help