

Chapter 1

Reflection questions:

1. Why is it important for educators to foster interdisciplinary learning? How does integrating the Arts into STEM (forming STEAM) create a more inclusive and accessible learning experience for MLs?
2. In what ways do culture and language intersect with MLs' identity development as STEAM learners?
3. The chapter discusses the alignment of NGSS, WIDA ELD Standards, and National Core Arts Standards to support MLs in STEAM education. How can educators effectively integrate these standards to promote both content knowledge and language development? What challenges might arise, and how can they be addressed?

Recommended Activities:

1. Activity: Facilitate MLs' Linguistic and Cultural Exploration through STEAM Projects

What: Create opportunities for MLs to explore how their linguistic and cultural assets relate to various STEAM concepts.

How:

- Research MLs' linguistic and cultural backgrounds to gain an understanding of the dynamic and complex nature of MLs' cultural identities and recognize how culture is fluid and shaped by multiple influences.
- Identify points of intersection in MLs' languages and cultural practices that can be linked to STEAM topics.
- Develop and implement activities where MLs can research and relate their linguistic and cultural identities to STEAM concepts. Encourage them to express how their heritage informs their understanding of science, technology, engineering, mathematics, and the arts.

2. Activity: Integrate NGSS, WIDA, and Arts Standards in a STEAM Unit

What: Align STEAM unit plans with CCSS, NGSS, WIDA, and National Core Arts Standards.

How:

- Locate an existing STEM/STEAM unit or create a new one, if applicable.
- Assess which standards (e.g., CCSS, NGSS, WIDA, and NCA) are addressed and which ones are not.
- Identify additional standards that can be integrated into the unit to make it more aligned with the interdisciplinary nature of the STEM field and focus on the functional use of language.
- Ensure that assessments and activities consider both content knowledge, language proficiency, and artistic skills.
- Teach the unit and reflect on how the revised unit impacts MLs' scientific reasoning, language development, and artistic expression.
- Modify the unit for future iterations.

Resources in the chapter which includes Extension of LP or detailed unit/IP (Templates)

N/A

Related Resources

NGSS (Next Generation Science Standards): <https://www.nextgenscience.org/>

WIDA English Language Development (ELD) Framework and Standards:

<https://wida.wisc.edu/teach/standards/eld>

National Core Arts Standards: <https://www.nationalartsstandards.org/>

Common Core State Standards: <https://corestandards.org/>

Related Reading

Babaci-Wilhite, Z. (2020). Linguistic and cultural rights in STEAM education: Science, technology, engineering, arts, and mathematics. In J. Abidogun & T. Falola (Eds.), *The Palgrave handbook of African education and indigenous knowledge* (pp. 715-735). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-38277-3_35

Cummins, J. (2013). Language and Identity in Multilingual Schools: Constructing Evidence-based Instructional Policies. In D. Little, C. Leung & P. Van Avermaet (Eds.), *Managing diversity in education: Languages, policies, pedagogies* (pp. 3-26). Bristol, Blue Ridge Summit: Multilingual Matters. <https://doi.org/10.21832/9781783090815-003>

May, S. (2014). *The multilingual turn: Implications for SLA, TESOL, and bilingual education*.
Routledge.