

WE-STEM



INSTRUCTIONAL FRAMEWORK



WONDER

introduce the lesson with an activity to connect the learning to what students think about and already know, what students might wonder about the topic of the lesson.

Example: I wonder if all atoms in the body or other objects look and behave the same way?



ESSENTIAL INQUIRY

The essential inquiry guides the lesson. This is written in a question form that the student will answer throughout the lesson.

Example: How can I apply my knowledge of understanding integers, both positive and negative, to a variety of types of atoms? What types of robotics may be used in atom research?



STEM STANDARDS

List the standards that represent what students will know and be able to do as a result of the lesson.

Example: Science-PS1.1 Develop and use models to illustrate the structure of atoms, including the subatomic particles with their relative positions and charge.
Math-7.NS.A.1-Applied and extend previous understanding of additional and subtraction to add and subtract rational numbers. Represent addition and subtraction on a horizontal or vertical number line.



THINKING GUIDE

Provide an agenda for what students will do during the lesson that focuses on the thinking process, how students will store and retrieve the new information from the lesson.

Example: Cup Design Activity
Math Activity-Understanding integers on a number line
Science Activity-Structure of Atoms
Robotics Activity- Article "World's first 'molecular robot' capable of building molecules"
Writing Activity-Write the answer to the Essential Inquiry



ENGAGE THE WONDER

Provide authentic learning experiences for students to engage their "wondering" about the topic.

Example:
PBL-Construct a model of a molecule
HOT questions-How does an atom relate to a molecule?
What are the various parts of an atom? How might a scientist use tiny robotics to study atoms and molecules?



MAKE A DIFFERENCE

Authentic assessment that requires students to demonstrate mastery of standards and provides metacognition (thinking and reflecting about their learning to facilitate retention.

Example: Students present their molecule model with an explanation of integers as it relates to positive, negative, and neutral protons/electrons.