STEM TEACHER ACTIONS

NATIONAL INSTITUTE *for* STEM EDUCATION

1 Creating An Environment for Learning

Creating a Positive Classroom Culture *Action 1*

+ The Physical Space: Safe and Accessible *Indicator 1*
+ The Physical Space: Student Interactions *Indicator 2*
+ Classroom Routines & Procedures *Indicator 3*
+ Student-Teacher Interactions *Indicator 4*
+ Academic Focus *Indicator 5*
+ Response to Failure & Intellectual Risk Taking *Indicator 6*

Establishing Cooperative Learning *Action 2*

+ Student-Student Interactions *Indicator 7*
+ Student Interdependence *Indicator 8*
+ Collaboration & Conflict Resolution *Indicator 9*

Integrating Technology *Action 3*

+ Technology Integration *Indicator 10*
+ Enhancement of Learning with Technology *Indicator 11*

Connecting Learning Outside the Classroom *Action 4*

+ Real-World Connections *Indicator 12*

2 Building Scientific Understanding

Implementing Inquiry *Action 5*

+ Student Contribution *Indicator 13*
+ Lesson Sequence *Indicator 14*

Addressing Student Misconceptions *Action 6*

+ Probing for Misconceptions *Indicator 15*
+ Resolving Misconceptions *Indicator 16*

Facilitating Questioning & Discourse *Action 7*

+ Processing Time Provided *Indicator 17*
+ Levels of Cognition *Indicator 18*
+ Equity of Responses *Indicator 19*
+ Follow-Up to Student Responses *Indicator 20*

Utilizing Assessment *Action 8*

+ Checking for Understanding *Indicator 21*
+ Utilizing Formative Assessment Data *Indicator 22*

Building Scientific Literacy *Action 9*

+ Reading in Science *Indicator 23*
+ Writing in Science *Indicator 24*
+ Conceptual Understand & Vocabulary Development *Indicator 25*
+ Nonlinguistic Representations *Indicator 26*
+ Presentation of Ideas & Listening to Others *Indicator 27*

3 Engaging Students in Scientific and Engineering Practices

Cultivating Scientific Investigations *Action 10*

+ Investigable Questions *Indicator 28*
+ Investigative Design *Indicator 29*

Developing Engineering Solutions *Action 11*

+ Identifying Engineering Problems *Indicator 30*
+ Engineering Design Process *Indicator 31*

Fostering Data Utilization *Action 12*

+ Organizing and Presenting Data *Indicator 32*
+ Interpreting Data *Indicator 33*

Implementing Project Based Learning (PBL) *Action 13*

+ Authenticity of Driving Question *Indicator 34*
+ Student Autonomy *Indicator 35*

Developing Scientific Explanations *Action 14*

+ Development of Explanation *Indicator 36*
+ Support of Explanation *Indicator 37*

Facilitating Scientific Explanations *Action 15*

+ Analysis & Critique of Explanations *Indicator 38*

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