

TEACHER GUIDANCE DURING SCIENCE INVESTIGATION AND ENGINEERING DESIGN



STUDENTS
**MAKE SENSE OF
PHENOMENA
AND DESIGN
CHALLENGES**

TEACHERS

- ✓ Select and present real and relevant phenomena or challenges
- ✓ Guide observation and development of student questions
- ✓ Facilitate students developing and using meaningful and relevant questions



STUDENTS
**GATHER
AND ANALYZE
DATA AND
INFORMATION**

TEACHERS

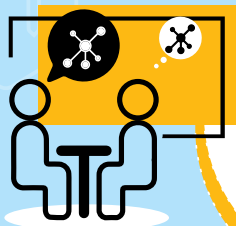
- ✓ Communicate clear expectations for use of information as evidence
- ✓ Facilitate connections between relevant ideas and crosscutting concepts



STUDENTS
**CONSTRUCT
EXPLANATIONS
AND DESIGN
SOLUTIONS**

TEACHERS

- ✓ Communicate clear expectations for students to develop evidence-based explanations and models
- ✓ Set clear expectations for students to develop arguments for how their evidence supports explanations
- ✓ Support design and testing of solutions to challenges, including re-design and re-testing as students refine their approach



STUDENTS
**COMMUNICATE
REASONING TO
SELF AND
OTHERS**

TEACHERS

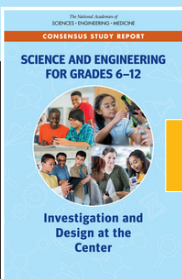
- ✓ Provide opportunities for students to produce multiple models and other artifacts that communicate their reasoning
- ✓ Establish a classroom culture of respect and guide productive and inclusive discourse
- ✓ Reflect on student and teacher learning



STUDENTS
**CONNECT
LEARNING
THROUGH
MULTIPLE
CONTEXTS**

TEACHERS

- ✓ Highlight connections to experiences and phenomena students have encountered in previous learning environments
- ✓ Plan coherent support for students to connect learning to phenomena beyond the classroom



Learn more about the report at
www.nap.edu/25216

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