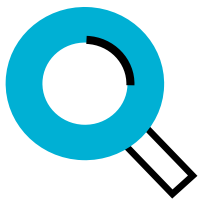
Think like a Scientist

Science & Engineering Practices for Your Classroom

Asking Questions and Defining Problems

What would happen if . . . ?
Why does . . . happen when . . . ?
How does . . . impact . . . ?
Does . . . cause . . . ?
How does . . . work?

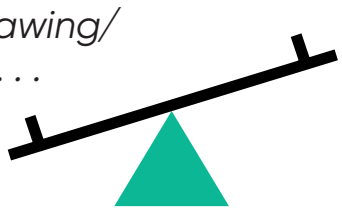


Engaging in Argument from Evidence

How does evidence support this idea?
How can we verify . . . ?
How can the results be replicated?
Are there other explanations?
How are all variables controlled?

Developing and Using Models

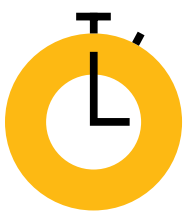
I can represent this with . . .
The model is limited by . . .
In this model . . . shows how . . .
I can use a simulation/drawing/ 3D model/math to show . . .



Using Mathematical and Computational Thinking

How can we model variable relationships with math?
What patterns do we see?
How can we use a math model to support/refute our claim?
Does the pattern allow us to predict . . . ?

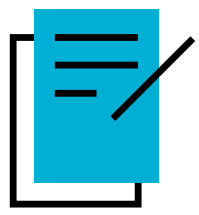
Planning and Carrying Out Investigations



What testable question(s) are we exploring?
What are our initial claims?
How will we collect the data?
How will we control the variables?
What are the criteria and constraints?

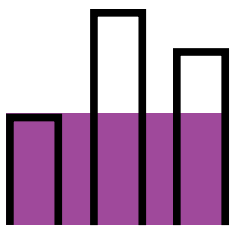
Constructing Explanations and Designing Solutions

Using the data, we can design . . . to solve . . .
We can refine the system by . . .
The data explains how . . .
We can prioritize criteria and account for constraints to engineer . . .

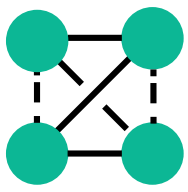


Analyzing and Interpreting Data

When . . . increases/decreases . . . changes.
How can the data best be displayed?
Is the sample size statistically significant?
Is the pattern statistically significant?
Are the correlations evidence of causation?



Evaluating and Communicating Information



How can we gather related information?
How can we verify the claim is valid/reliable?
How can we best display our findings?
Do other sources support/refute . . . ?