

Science and Engineering Practices



How can fireflies communicate to attract a mate?



Scientists

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Engineers

Science helps us explain phenomena.

Phenomena are naturally occurring events that have a cause.

Engineering helps us solve problems.

Criteria are the rules that need to be met.

How can I design a device to sort trash?



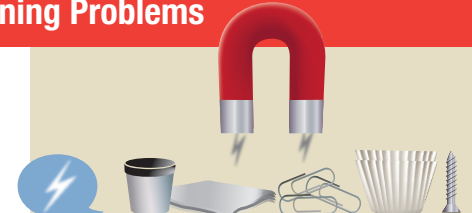
Asking Questions



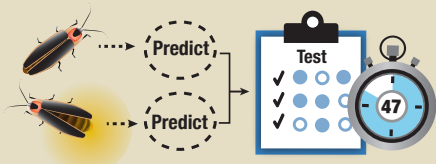
Ask answerable questions about something they can't yet explain.

Defining Problems

Describe a problem's criteria and limits.

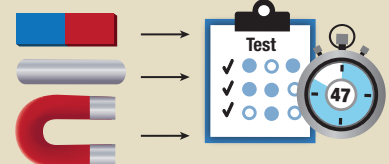


Developing and Using Models



Use a model to predict what will happen.

Use models to help test solutions.

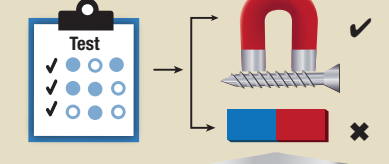


Planning and Carrying Out Investigations



Plan procedures.
Collect data.
Test explanations.

Test design ideas.
Decide if the ideas solve the problem.

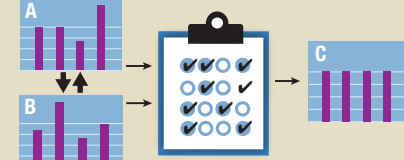


Analyzing and Interpreting Data

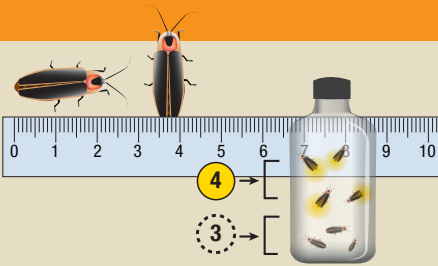


Use tools such as tables and graphs to...
Look for patterns in the data.
Does the data support the explanation?

Compare results for different designs.



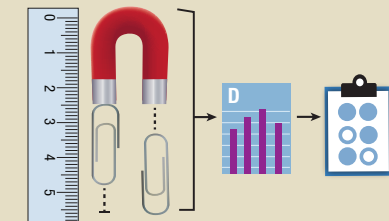
Using Mathematics and Computational Thinking



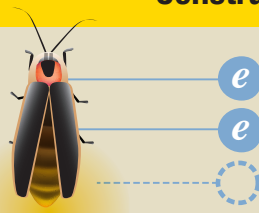
Develop models and make predictions.
Analyze data.
Look at patterns.

Use math to...

Develop models of different design ideas.
Predict—will a plan work?
Analyze data.

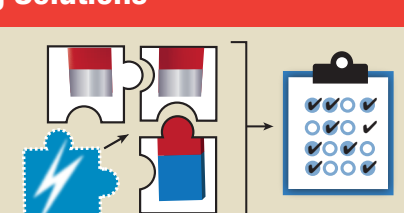


Constructing Explanations

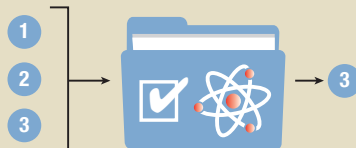


Develop theories based on evidence to explain a phenomenon.

Develop and improve solutions to problems.
Do solutions meet criteria?

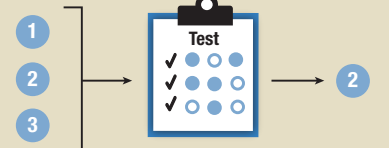


Engaging in Argument from Evidence

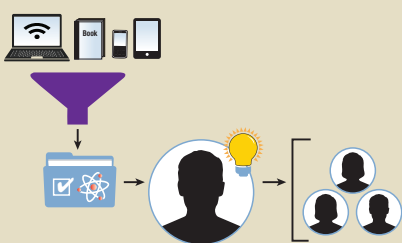


Decide on the best explanation for a phenomenon.
Base it on evidence and science.

Select and improve the best solution to a problem.
Base it on evidence from tests and rules.



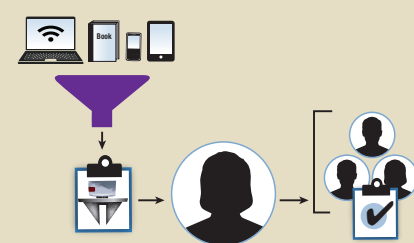
Obtaining, Evaluating, and Communicating Information



Use books and other media to learn more.
Decide if the sources are good ones.

Tell others about their ideas.

Tell others about the rules for the design ideas.



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