

LEARNING GOAL

Students investigate a climate indicator and build a mini evidence poster.

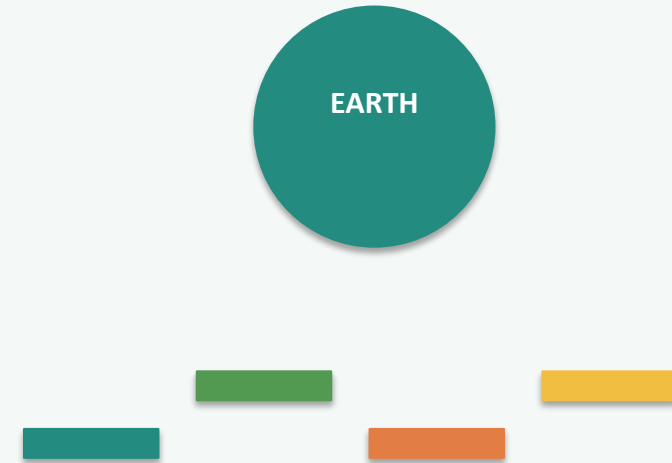
STEM CONNECTION

Climate literacy + data science

INTERACTIVE FLOW

Explore five climate “vital signs” → identify a trend → explain evidence → propose one action.

VISUAL / INTERACTIVE CANVAS



Observe → graph → explain → act

OPEN ACCESS

NASA Climate Change Online Lab

<https://www.nasa.gov/stem-content/climate-change-online-lab/>

LEARNING GOAL

Teams test how insulation, windows and shade affect heat transfer.

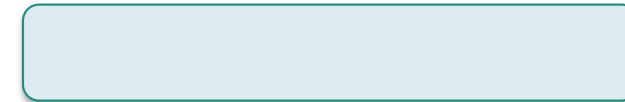
STEM CONNECTION

Physics + engineering

INTERACTIVE FLOW

Predict → change one variable → observe → record data → redesign.

VISUAL / INTERACTIVE CANVAS



**Adjust insulation
and compare temperature**

OPEN ACCESS

PhET Interactive Simulations

<https://phet.colorado.edu/>

LEARNING GOAL

Students model a watershed and decide how to protect water quality.

STEM CONNECTION

Earth science + systems thinking

INTERACTIVE FLOW

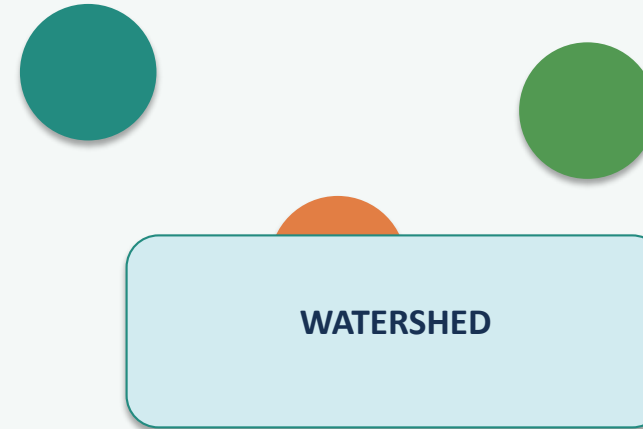
Map sources of pollution → model runoff → compare scenarios → defend a solution.

OPEN ACCESS

NASA Science / My NASA Data

<https://science.nasa.gov/learn/lessons-and-activities/>

VISUAL / INTERACTIVE CANVAS



Trace runoff → compare scenarios

LEARNING GOAL

Students optimize the angle and placement of a solar panel model.

STEM CONNECTION

Renewable energy + measurement

INTERACTIVE FLOW

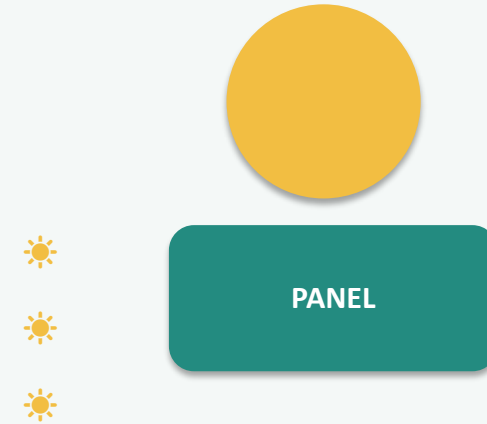
Make a prediction → test 3 angles → graph output → choose the best design.

OPEN ACCESS

Open simulation / classroom sensor activity

<https://phet.colorado.edu/>

VISUAL / INTERACTIVE CANVAS



Change angle → measure → optimize

LEARNING GOAL

Students redesign a product so fewer materials become waste.

STEM CONNECTION

Design + mathematics + sustainability

INTERACTIVE FLOW

Map material flows → calculate waste → redesign → pitch a circular product.

OPEN ACCESS

Open Educational Resources / OpenStax concepts

<https://openstax.org/k12/>

VISUAL / INTERACTIVE CANVAS



Linear → circular material flow

LEARNING GOAL

Students classify observations and use simple biodiversity measures.

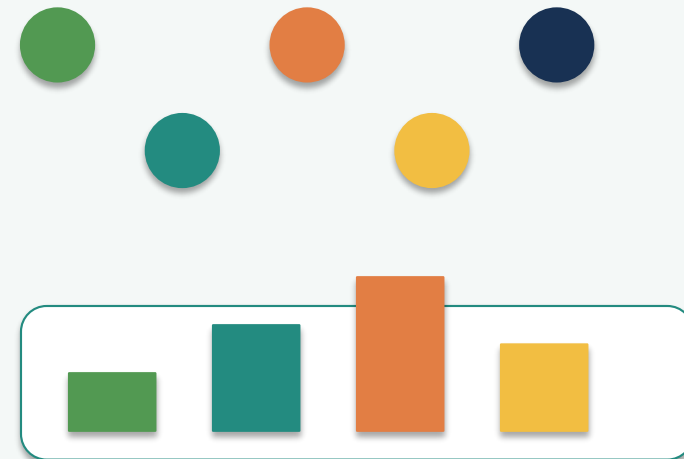
STEM CONNECTION

Biology + statistics

INTERACTIVE FLOW

Collect/compare observations → calculate species counts → discuss habitat change.

VISUAL / INTERACTIVE CANVAS



Count → calculate → interpret

OPEN ACCESS

NASA Earth observation resources

<https://www.nasa.gov/learning-resources/for-educators/>

LEARNING GOAL

Teams design a low-carbon school or neighborhood using constraints.

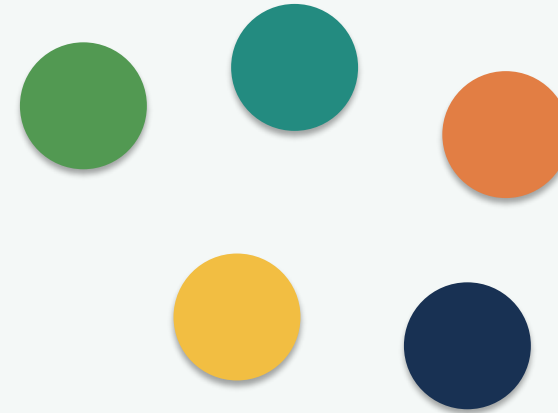
STEM CONNECTION

Coding + engineering + civics

INTERACTIVE FLOW

Set constraints → sketch system → test trade-offs → present a smart-city prototype.

VISUAL / INTERACTIVE CANVAS



Constraints

Energy • Mobility • Waste • Nature

OPEN ACCESS

NASA STEM engineering resources

<https://www.nasa.gov/learning-resources/search/>

LEARNING GOAL

Students compare everyday food choices using simplified resource-use data.

STEM CONNECTION

Math + chemistry + sustainability

INTERACTIVE FLOW

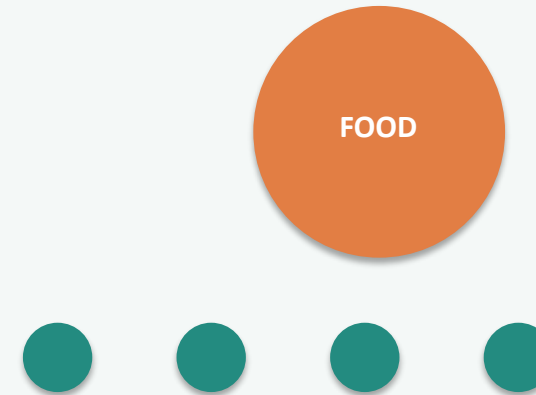
Interpret a dataset → calculate per-person impact → compare alternatives → justify a choice.

OPEN ACCESS

OpenStax science resources

<https://openstax.org/>

VISUAL / INTERACTIVE CANVAS



Compare options with a simple impact score

LEARNING GOAL

Students turn Earth-system data into a clear animated or annotated visual.

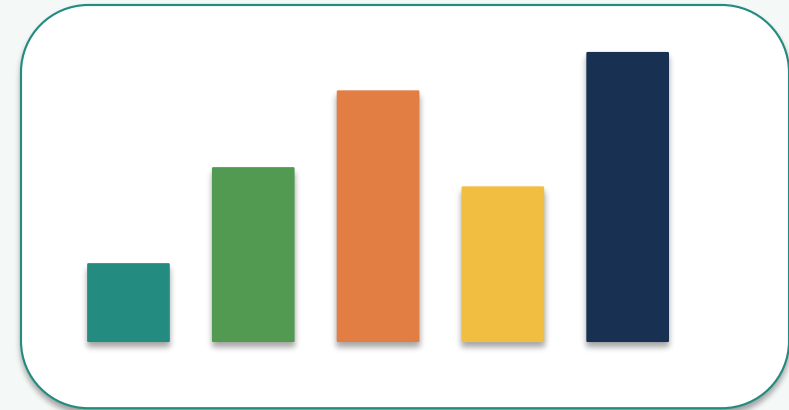
STEM CONNECTION

Data literacy + visualization

INTERACTIVE FLOW

Choose a dataset/visual → ask a question → annotate the pattern → communicate the story.

VISUAL / INTERACTIVE CANVAS



Data → visual → question → story

OPEN ACCESS

NASA Scientific Visualization Studio

https://svs.gsfc.nasa.gov/forEducators/Start_Here.html

LEARNING GOAL

A 45–60 minute challenge: solve a local sustainability problem using the engineering design cycle.

STEM CONNECTION

Integrated STEM + problem solving

INTERACTIVE FLOW

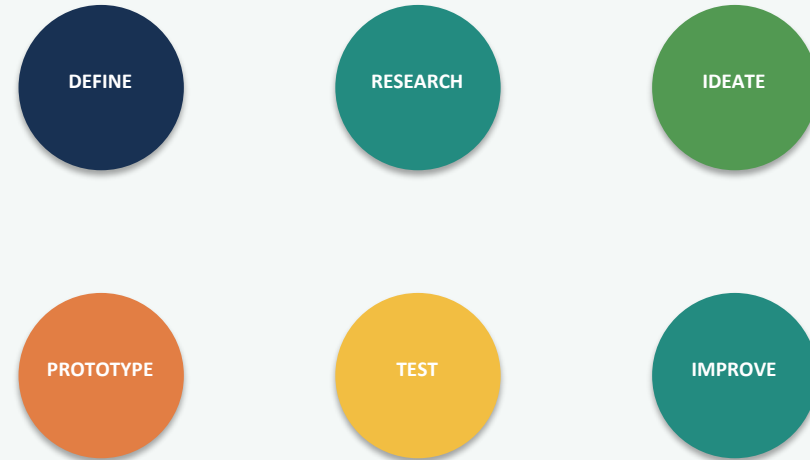
Define → research → ideate → prototype → test → improve → reflect.

OPEN ACCESS

PhET + NASA open resources

<https://phet.colorado.edu/>

VISUAL / INTERACTIVE CANVAS



Repeat the cycle until the solution improves

10 Interactive STEM & Sustainability Learning Materials

Open-access • inquiry-based • data-rich • classroom-ready

