How science works

EXPLORATION AND DISCOVERY

TESTING IDEAS

BENEFITS AND OUTCOMES

COMMUNITY ANALYSIS AND FEEDBACK
How science works

**EXPLORATION AND DISCOVERY**

- Making observations
- Asking questions
- Sharing data and ideas
- Finding inspiration
- Exploring the literature

**Gathering data**

- Hypotheses
- Expected results/observations
- Actual results/observations

**Interpreting data**

- Supportive, contradictory, surprising or inconclusive data may...
  - ...support a hypothesis.
  - ...oppose a hypothesis.
  - ...inspire revised assumptions.
  - ...inspire revised/new hypothesis.

**TESTING IDEAS**

- Develop technology
- Address societal issues
- Inform policy
- Solve everyday problems
- Build knowledge
- Satisfy curiosity

**BENEFITS AND OUTCOMES**

- Feedback and peer review
- Replication
- Discussion with colleagues
- Publication
- Coming up with new questions/ideas
- Theory building

**COMMUNITY ANALYSIS AND FEEDBACK**

- New technology
- Practical problem
- Curiosity
- Personal motivation
- Serendipity
- Surprising observation

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How science works

EXPLORATION AND DISCOVERY

Making observations
Asking questions
Sharing observations and ideas

TESTING IDEAS

Recording observations
Interpreting observations—What is different? What is the same?
Explaining what my observations make me think
Changing what I thought after more observations

BENEFITS AND OUTCOMES

Learning more
Answering questions
Satisfying curiosity

COMMUNITY ANALYSIS AND FEEDBACK

Talking about our ideas
Listening to classmates
Having others try your investigation
Coming up with new questions and ideas

Flowchart for K-2 – the E&D and CA&F bubbles should be bolder than the others as that is where most students will be working. The text should be modified to read:

E&D: Making observations
Asking questions
Sharing observations and ideas

Testing:
Recording observations
Interpreting observations—What is different? What is the same?
Using observations to tell what made me think that…
Changing what I thought after more observations

CA&F
Talking about our observations and ideas
Listening to classmates
Having others try your investigation
Recording in science notebooks
Coming up with new questions and ideas

B&O
Learning more
Answering questions
Satisfying curiosity

This science flowchart has been modified for grades K–2

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How science works

EXPLORATION AND DISCOVERY

Making observations

Asking questions

Sharing data and ideas

Reading about science discoveries

TESTING IDEAS

Coming up with an explanation

Gathering data

Interpreting observations

Revising what I thought after more observations

BENEFITS AND OUTCOMES

Learn more

Satisfy curiosity

Answer questions

Solve everyday problems

COMMUNITY ANALYSIS AND FEEDBACK

Feedback and peer review

Discussing with classmates

Listening to classmates

Repeating the investigation

Coming up with new questions and ideas

This science flowchart has been modified for grades 3–5

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