



Do Now: What is science?

- On page 10, with your partner, come up with a definition of science.

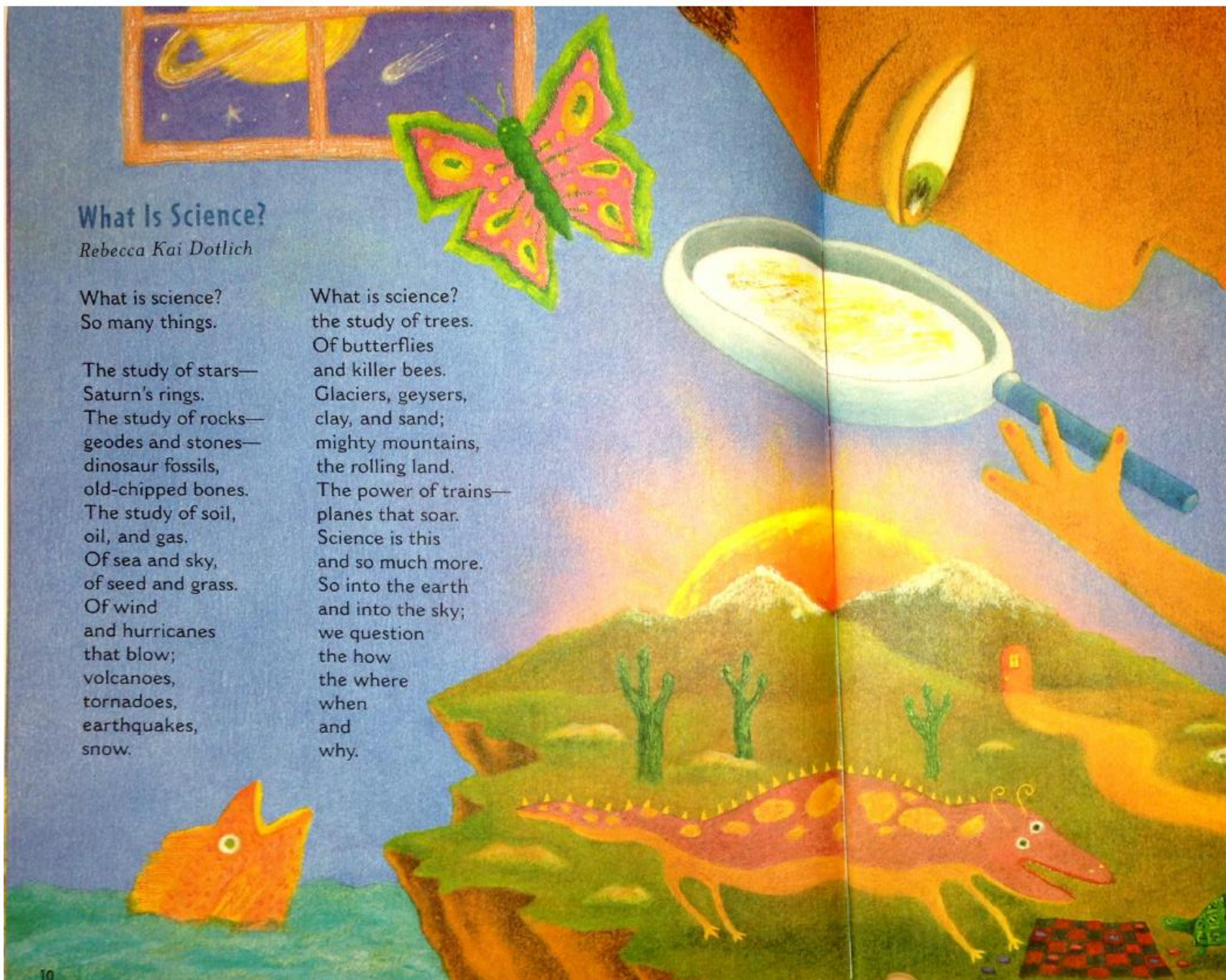
What Is Science?

Rebecca Kai Dotlich

What is science?
So many things.

The study of stars—
Saturn's rings.
The study of rocks—
geodes and stones—
dinosaur fossils,
old-chipped bones.
The study of soil,
oil, and gas.
Of sea and sky,
of seed and grass.
Of wind
and hurricanes
that blow;
volcanoes,
tornadoes,
earthquakes,
snow.

What is science?
the study of trees.
Of butterflies
and killer bees.
Glaciers, geysers,
clay, and sand;
mighty mountains,
the rolling land.
The power of trains—
planes that soar.
Science is this
and so much more.
So into the earth
and into the sky;
we question
the how
the where
when
and
why.





Do Now: scavenger hunt! Can you find the following items?

- Telephone
- Turn in box
- Student supplies - colored pencils, scissors, calculators, rulers
- Hole punch and staplers (binder hospital)
- Tissues (2 places)
- Old and missed work files
- Pencil sharpeners (2 places)
- Sign out sheet and passes
- Science safety equipment
- Garbage cans (2)



What is science?

- Science is the way we learn about the natural world and is based on our observations.

Scientific Method



A blueprint for
experiment success.



What is the scientific method?

- It is a simple method scientists use to conduct an investigation.
- It is a way to answer scientific questions by asking questions & conducting experiments.



Steps of the Scientific Method

- Question
- Observation
- Hypothesis
- Experiment
- Data
- Conclusion
- Sharing



I. Question/Problem

- Ask a question about something **observed**.
 - Why?
 - How?
 - What?
- Question to be solved.
- Must be about something measurable.



Scientific Questions:

Must be

- Specific
- Measurable
- Testable
- Fact based – no opinion

Example:

Does eating chocolate cause acne?

Non example:

What's the best frog?



Do Now

Which questions can be answered by scientific investigations?

1. Is it ok to steal food if you have no money and are starving and will die without it?

2. Which recording artist is the most popular?

3. Which teacher on Team W is the most challenging?

■ Can you rephrase the question to make it scientific? How would you set up the investigation?



What question can we ask about
your origami frog?

- Write it on page 17.



II. Observation

- Quantitative – numbers
- Ex: 2 cm, 14, 122 degrees C, 6 sides

- Qualitative – description and patterns, not numbers
- Ex: green, shiny, cold, 3 pictures are related by a food chain, all even numbers are shaded,



Jump Your Frog

- Jump your frog and record your observations on p 18.
- You might want to use a data table.
- How many times will you jump it?

- Then review writing a hypothesis on p 25 and practice on p 26. Read about how to identify variables on p 25 and practice on p 26.



III. Hypothesis

- Testable
- If, then because statements
 - If _____ [*I do this*], then _____ [*this will happen*] because _____ (explain why you think it will happen)
- Educated prediction about how things work.
- Mnemonic - TIE

Do NOW:

Using what you know about the steps in the scientific method, what is going on in this cartoon?



Do NOW

Write a hypothesis for the cartoon.

Use

If.. Then...because...

What are the variables?





Do Now

- Do number 1 and 2 on the top of p 24.



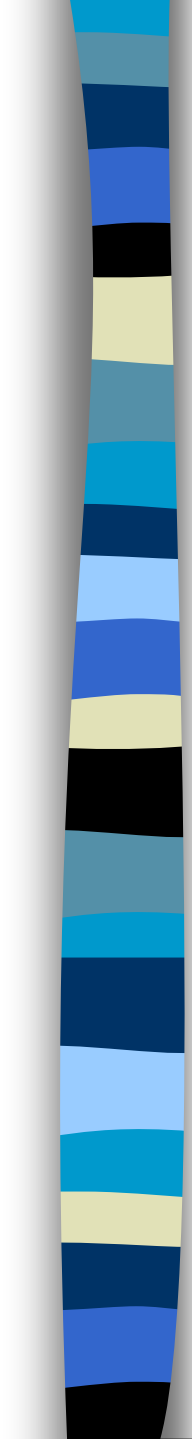
IV. Experiment

- Experiment: set of steps that tell what you will do to test your hypothesis
- Tests your **hypothesis**.
Is it accepted (right) or rejected (wrong) ?
- Change only one **variable**.



Variable – (from the word) varies

- The **Independent variable** is the condition (thing) that the scientist controls or changes on purpose. The “**i**f” part of a hypothesis. **I** do it. (The **cause** of the change.)
- The **dependent variable** is what happens in the experiment due to the change. The “**then**” part of the hypothesis. (the **effect**)



Experiment: A set of steps that tell what you will do to test your hypothesis.

- **Control** – part you do nothing to, to compare to what changes.
- **Data** – information you measure.
- **Variable** – the things that change.
- **Constant** – Everything **except your variable** stays exactly the same.
- **Trial** – You need to test it more than once



Experiment

- Record your data in a data table.
 - Numerical (quantitative) data organized in rows and columns
 - The specific independent variables are listed
 - The number of trials are listed
 - Blanks are left for the data (dependent variable) to be filled in



Experiment

Title: Describing the Data

Trial	Variable 1	Variable 2	Variable 3
1			
2			
3			
4			
5			
6			
AVERAGE			

Data Table

Frog Jump Data Table

trial	Jump 1 in cm	Jump 2 in cm	Jump 3 in cm	Average = (Jump 1 + Jump 2 + Jump 3) ÷ 3 in cm
Frog 1				
Frog 2				
Frog 3				
Frog 4				



Do now: More than one trial?

- Find the mean average of Santiago's frog's jumps:

Trial	Santiago's frog jump length
1	6 cm
2	3 cm
3	3 cm

Remember:

Average = add up the trials and divide that by the number of trials



IV. Data Analysis

- Reduce the data

- Average (Mean) = add up values and divide by the number of values

- Graph

- Graph the data to look for trends & relationships.



V. Conclusion

- Summarize your experiment.
- Restate hypothesis.
- Give data. What does the data mean?
- How is the scientific concept represented here?
- Underline scientific vocabulary.



What is the difference between a summary or conclusion and a reflection?

Summary

- Focuses on the main ideas and supporting details
- Addresses the essential question or objective
- Processes information
- Avoids personal input and opinions

Reflection

- Focuses on the learning process
- Connects new learning to prior learning
- Considers how it effects life
- Includes personal thoughts and experiences

What makes this funny? Use your science vocabulary.

