

Science Journaling

Content Standard – Science as Inquiry:



- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry

Why journal?

Inventors, engineers, naturalists, and scientists all keep written records of their work. Generally their records are in a journal or log book. Most use paper and pencil because they are readily available regardless of the work location. The records can be essential for making observations, recording theories, posing connections, recording additional research topics and documenting discoveries or new ideas.

Scientific Journaling provides a method for students to see and understand science phenomena through reconstructing their experiences. Students gain the following skills through regular use of scientific journals:

- Making observations
- Recording events
- Communicating understanding of concepts
- Communicating observations and ideas
- Developing organizational skills
- Developing questioning abilities
- Practicing and developing fine motor skills
- Expressing information in graphic forms
- Analyzing data
- Linking disciplines
- Communicating classroom activities with parents
- Reflecting on what they have learned

Science notebooks or journals should be a tool for students to work out science concepts and their understanding by using organizational and recording strategies that are personally meaningful.

Science Notebook Methods and Content

The following are different strategies or methods for using science logs, journals, or notebooks in the classroom. In addition to the description of the method, some examples for the use of the method are provided.

Individual Notebook

Students maintain their own notebook or logbook. Notebooks could be used for a single topic or unit for example – rocks, planets, or weather. The notebooks could also be ongoing, where all labs and activities are recorded for a specific period.

Class Notebook

A class notebook is generally focused on one subject and all students contribute their observations over a period of time. Sample topics include: writing about class pets; making weather observations; recording the phases of the moon; and documenting a plant's life cycle.

I Think, I Saw, I Discovered

This method of science journaling allows students to make predictions, record their observations and summarize the activity.

The three topics for this type of entry are:

Hypothesis – what they think will happen

Observations – what they saw/observed, data, questions

Conclusions – what they learned, their conclusions, their thoughts

This method is a good introduction to the scientific method and is appropriate for early elementary students.

I Know, I Wonder, I Learned, Now I Wonder

This journal method consists of four parts with the emphasis on what is know and learned from the activity/experiment as opposed to the observations and conclusions. Students have a chance to express what they already know before starting and what new questions they have based on the experience.

The four topics to cover include:

What they already know about the topic

What they would like to learn about the topic

What they learned during the activity/experiment/unit

What additional questions were raised from the experiment?

It gives students practice with monitoring their own learning or meta-cognition.

OWL Chart – Observe, Wonder, Learn

This method uses a three column graphic organizer, allowing the students to arrange their thoughts and observations in a different format. The three topics are:

Observe	Wonder	Learn

“I Used to Think But Now I Know”

This double entry graphic organizer helps students record how their thinking has changed.

I used to think...	But now I know ...

This can be used with a follow-up or extension activity on a topic that has been covered or as an assessment at the end of a unit.

Tips

The following are tips for implementing the use of science journals/notebooks in the classroom.

- Select a format that works with the goal or activity: quick experiments, thematic units, ongoing observations. Depending upon the curriculum it is possible to have multiple journals/notebooks in process at the same time. For example – the class might have a weather log; each student might have a daily nature observation log, and a journal for a specific topic such as machines.
- Date entries – concepts can be built upon and lead to the analysis of patterns. Dating entries helps to reinforce the importance of regular journal entries.
- Drawings are an important part of the notebook. They help with expressing complex ideas and incorporate different learning and communication styles.
- Provide a context before the lesson or activity and include ideas about what the students might observe, write, or draw in their notebooks.
- Keep your own notebook and share it with the students. This will help you grow as a scientist and help you understand what the students are experiencing.
- Make routine observations – same time daily, weekly or monthly. This helps students see patterns and analyze changes. Observation topics might include the environment, weather, the view from the classroom window, the students' height.
- Allow time during activities and experiments for students to record observations.
- Observe how students are recording information – use those observations to guide future activities. For example, if students are mainly writing and not drawing, explain the importance of visual representations for the information.
- Before assessing the notebooks, determine what needs to be assessed: scientific content, observations made, writing and grammar, or other aspects.
- Have students use journals to share what they have learned and their understanding of the topic with other students and their parents. This helps reinforce their understanding of the material and can help identify any misconceptions the students might have.

- Use the journals for other assignments and projects. For example, if the students are writing a paper on their favorite animals, their science journal could be a place to record their research and observations or serve as a resource for information.
- Encourage students to review previous journal entries to answer questions for new assignments or formulate observations based on their expanding experiences.

Prompts for science logs/journals

- I wonder why
- I was really surprised when
- During the discussion, I wondered
- I see a pattern in
- I know
- I think this _____ because _____.
- This makes _____ this happen _____.
 - The chain on the gear makes the back wheel turn.
- What patterns do you see _____
 - What patterns do you see in nature on your way to school?
- How are a _____ and a _____ related?
 - How are an oak leaf and an acorn related?
 - How are an apple and a snail related?
- What do/did you see/hear/feel?
- What did it look like?
- What do you think the functions(s) are?
- How does this relate to others you have seen?
- Science question of the week – pose a question
- How could we _____?
 - How could we observe weather conditions?
- What factors might cause _____?
 - What factors might cause temperature change?
- Where could we _____?
 - Where could we test the temperature?
- After looking at your data table, what did you notice?
- What is happening here?
- Compared to yesterday, what changes have you noticed?
- What predictions can you make?
- What would happen if you threw a piece of trash on the ground? What if everyone did?
- What would happen if you grew taller than trees? How would the effect the environment?
- What would happen if there were no cars, buses, trains, boats, or planes? How would this change the world as we know it?
- What if everyone lived under water? in space? in trees?
- What do you think the world needs now?
- What do you think someone in _____ grade can do to help reduce the amount of pollution in our environment?
- What would you invent to make life better?

Science Journal Covers

Journal covers examples can be downloaded from the “Science Journal” link at: <http://www.micron.com/k12/resources> . Copy in black and white or in color and add the appropriate number of blank pages to the inside.

