Journaling Lesson Plan

Overview

Journaling is crucial to teach students mathematical concepts, practices, and strategies. Journaling during instructional activities allows students to capture notes they can use during practice and mastery checks. Journaling after solving a problem or at the end of a lesson creates opportunities for reflection, helping to develop metacognition, strengthen mathematical practices, and improve problem-solving skills.

Because this practice has such a significant impact on efficacy and provides teachers with valuable insight to student thinking, journals should be required for students and should be reviewed regularly. Journaling can present challenges for students who are less comfortable with writing and expression. In these cases, use district and specialist guidance for providing accommodations and scaffolds such as options for audio recording reflections, discussing, drawings, and models using manipulatives instead of writing.

Journaling with specific focus should occur at the following points in each Imagine+ Math lesson:

Instructional Activity: Journaling during the key learning step of each lesson deepens understanding, promotes use of multiple representations, and directs productive struggle.

Problem-Solving Process: Journaling during problem-solving items provides more opportunities for expressing knowledge, strategies, and approaches.

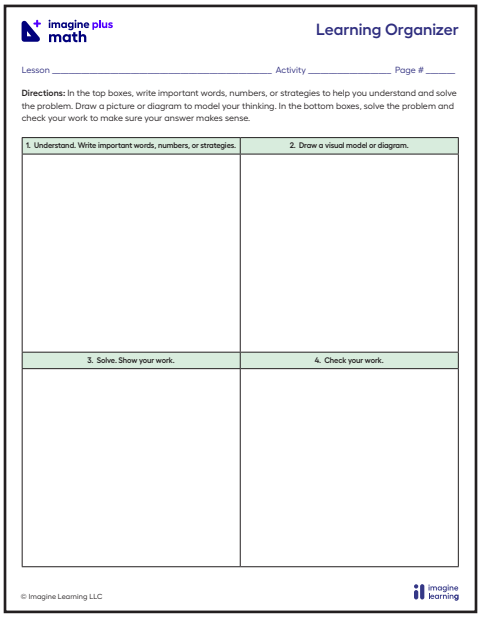
End of Lesson: Journaling after completing a lesson provides opportunities for reflecting on performance and strategies. It also serves to develop metacognition through analyzing learning processes and self-regulation habits by struggling productively.

Student and teacher rubrics are provided and should be applied to a small collection of journal entries, not an individual entry.

Learning Organizer

Instructional activities help students learn a new standard, concept, or skill. Learning organizers provide students with useful notes as they complete the remainder of the lesson.

1. **Display an Example.** Project an example problem to your class. Choose a topic that is familiar to the students.
2. **Provide the Organizer.** Provide students with copies of the Learning Organizer, or have them copy the organizer into notebooks.
3. **Introduce Math Journaling.** Explain: *"As a class we are going to work through this problem and complete the graphic organizer. Every time you are in an instructional activity, complete these steps to ensure you build understanding and have a record for reflection."*


imagine plus math

Learning Organizer

Lesson _____ Activity _____ Page # _____

Directions: In the top boxes, write important words, numbers, or strategies to help you understand and solve the problem. Draw a picture or diagram to model your thinking. In the bottom boxes, solve the problem and check your work to make sure your answer makes sense.

1. Understand. Write important words, numbers, or strategies.	2. Draw a visual model or diagram.
3. Solve. Show your work.	4. Check your work.

© Imagine Learning LLC

imagine learning

4. **Model and Think Aloud.** Read the question aloud. Model how to use the glossary to clarify math terms or academic vocabulary. Model how to use the tools panel to locate formulas. Then think aloud as you model using the Learning Organizer to take notes as you solve the problem.

   a. Work with students to identify important words and write them in Box 1, including definitions from the glossary if needed. Also record key numbers and strategies that will help students understand and solve the problem.

   b. Draw a visual model or diagram in Box 2 to represent the problem, and invite students to help you build it.

   c. Have students individually work out the problem in Box 3. Invite volunteers to talk through the different strategies they used to solve the problem.

   d. Answer the question correctly. Read aloud the feedback that explains why the answer is correct. Remind students to always read and reflect on this content to solidify learning. In Box 4, have students check their work and correct any mistakes they find. Encourage students to use different strategies to confirm their answers.

5. **Restate Purpose.** Remind students that the journal is an important part of the learning process and will help them meet their Imagine+ Math goals. Remind students to complete a journal entry for each problem in the instructional activity.

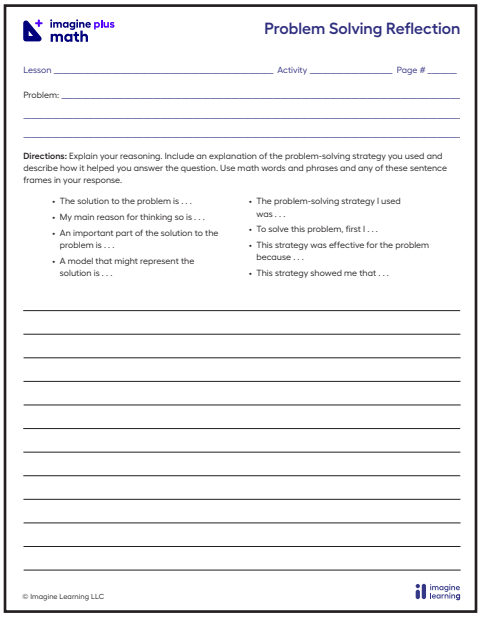
Problem Solving Reflection

Encourage students to follow a five-step process to deepen their understanding and develop productive habits of mind.

1. **Plan and Prepare.** Choose a problem on a topic that is familiar to the students. Work through the problem on your own, with the goal of being prepared to summarize the problem to students. Note the problem-solving strategy that is used to solve this problem.

2. **Provide the Organizer.** Provide students with copies of the Problem-Solving Reflection, or have them copy the reflection prompt into notebooks.

3. **Introduce Problem Solving Reflection.** Explain: *"After each problem, take a few moments to reflect on the experience. Think about the strategy you used to solve the problem and how you can explain what you did to others. Explaining your reasoning will help you learn better."*


imagine plus math

Problem Solving Reflection

Lesson _____ Activity _____ Page # _____

Problem: _____

Directions: Explain your reasoning. Include an explanation of the problem-solving strategy you used and describe how it helped you answer the question. Use math words and phrases and any of these sentence frames in your response.

- The solution to the problem is . . .
- My main reason for thinking so is . . .
- An important part of the solution to the problem is . . .
- A model that might represent the solution is . . .
- The problem-solving strategy I used was . . .
- To solve this problem, first I . . .
- This strategy was effective for the problem because . . .
- This strategy showed me that . . .

© Imagine Learning LLC

imagine learning

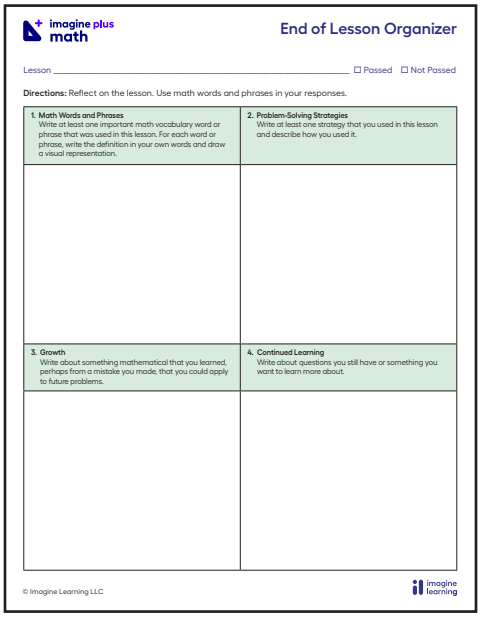
4. **Summarize the Problem.** Summarize the problem to the students. Briefly discuss what you needed to find and the quantities and relationships involved.

5. **Model and Think Aloud.** Read the instructions on the Problem Solving Reflection out loud. Read through each of the sentence stems and explain the depth of communication that is appropriate. Demonstrate the problem-solving strategies and the math words and phrases. Then think aloud as you write a response on the graphic organizer.

6. **Restate Purpose.** Remind students that the journal is an important part of the learning process and will help them meet their Imagine+ Math goals.

End of Lesson Organizer

Building a regular habit of reflection helps students remember important math words and phrases, hone problem-solving strategies, and develop self-regulation strategies.


imagine plus math

End of Lesson Organizer

Lesson _____ ☐ Passed ☐ Not Passed

Directions: Reflect on the lesson. Use math words and phrases in your responses.

1. Math Words and Phrases Write at least one important math vocabulary word or phrase that was used in this lesson. For each word or phrase, write the definition in your own words and draw a visual representation.	2. Problem-Solving Strategies Write at least one strategy that you used in this lesson and describe how you used it.
3. Growth Write about something mathematical that you learned, perhaps from a mistake you made, that you could apply to future problems.	4. Continued Learning Write about questions you still have or something you want to learn more about.

© Imagine Learning LLC

imagine learning

1. **Plan and Prepare.** Choose a lesson on a topic that is familiar to students. Decide whether you prefer to have students use the prompts for discussion, writing, or both. Consider your goals in language development, the classroom format (centers work, lab, one-on-one), and whether students will be completing lessons during school hours or after school. You may choose to provide options for different learners.

2. **Provide the Organizer.** Provide students with copies of the End of Lesson Organizer, or have them copy the organizer into notebooks. You may also wish to display the prompt that appears at the end of the lesson.

3. **Introduce End of Lesson Journaling.** Explain: *"After each lesson, take a few moments to record your learning. This will help you remember what you have learned and record key points to remember when completing future lessons. Remind students to embrace both correct and incorrect answers and lessons passed as well as lessons that were not passed. Productive struggle is essential to learning in all subjects."*

4. **Model and Think Aloud.** As you complete the elements of the organizer, think aloud to model metacognition and self-analysis.

    a. Read the instructions in Box 1 aloud. Model using the glossary to find a definition for a math word or phrase used in the lesson. Then record a paraphrased definition of the word or phrase and draw a visual representation. By rephrasing the definition, students will deepen their understanding of the math word or phrase.

b. Read the instructions in Box 2 aloud. Demonstrate the list of problem-solving strategies and explain that each strategy can help organize thinking in a different way. Emphasize that there are often multiple strategies that can lead to the same solution. Choose a strategy appropriate for the lesson content and draft a response. Demonstrate the math words and phrases and use them appropriately in your response.

c. Read the instructions in Box 3 aloud. Model a common mistake related to the lesson topic and then record the principle that corrects the mistake in Box 3. Remind students that making mistakes is an important and beneficial part of the learning process.

d. Read the instructions in Box 4 aloud. Record an example of a question students might have. Engage in a discussion about what students could do to find answers to their questions. As you review journals, use these questions to inform class discussion topics, lessons, and learning experiences.

5. **Restate Purpose.** Remind students about the importance of productive struggle and the need to carry lessons learned from success and struggle forward as they continue their mathematics journey. Explain when and how you will review reflection journal entries.

Reviewing Journals

Reviewing journals regularly is important for efficacy. To help with journal review, Imagine+ Math has provided a rubric for teachers and a rubric for students. You can use the student rubric to promote self-assessment or peer review. Use the following steps to introduce the student rubric to the class.

1. **Introduce the Rubric.** Display the student journal rubric to the class. Explain: *"This shows what I will be looking for when I review your journals. Keep this with your journal. Each time you complete a journal entry, check this rubric to see if it is a good record of your math learning. You can update entries to make them better."*

2. **Practice Revising.** Provide each student with a copy of a blank rubric. Display an example of a journal that you would score a 1 or 2 using the rubric. Think aloud as you describe what is missing from the sample journal entry. Then, invite students to pretend that this was their draft and edit the journal entry so that it will score a 4 on the rubric.

3. **Practice Peer Review.** Have peers trade revised versions and compare them. Remind students that individuals may take different strategies and use varying representations or models.

4. **Set Expectations.** Share information about the frequency and logistics of how you plan to collect and review journals so students know what to expect.

Criteria and Score	4 **Exceeding Expectations**	3 **Achieving Expectations**	2 **Approaching Expectations**	1 **Not Yet Addressing Expectations**
Content	Models problem using **more than one** type of visual representation Consistently shows **all** steps in solving problems **Accurately** explains and supports mathematical reasoning	Models problem with a **complete** visual representation Generally shows **most** steps in solving problems **Generally** explains and supports mathematical reasoning	Models problem with a **partial** visual representation Shows **some** steps in solving problems **Partially** explains or supports mathematical reasoning	**Does not** model problem with a visual representation Shows **few/no** steps in solving problems **Neither explains nor supports** mathematical reasoning
Receptive Math Language	Correctly follows **all** directions given in journal prompt	Correctly follows **most** directions given in journal prompt	**Partially** follows directions with some accuracy	**Shows no evidence** of understanding or following directions
Productive Math Language	**Consistently** uses mathematical language, structures, and conventions in journal entry	**Generally** uses mathematical language, structures, and conventions in journal entry	**Rarely and sometimes incorrectly** uses mathematical language, structures, and conventions in journal entry	**Does not** use mathematical language, structures, or conventions in journal entry
Organization	Journal entries are **consistently** neat, clear, and logically organized	Journal entries are **generally** neat, clear, and organized	Journal entries are **somewhat** neat and organized	Journal entries are **unclear** or disorganized

Student Rubric

How am I doing so far? Assess your journal entry and check the appropriate box for each category below. Aim to be a Math Superhero!	**3** **Math Superhero**	**2** **Math Apprentice**	**1** **Revisit My Work**
I set a goal(s) for this lesson and tracked progress towards my goal(s).			
I included all my problem-solving strategies and steps.			
I clearly explained my work with multiple representations.			
I included connections, graphical representations, models, and labels where appropriate.			
I described and supported my mathematical reasoning and the mathematical practices I used to make sense of the problem.			
I expressed myself using mathematics-specific language, correctly reflecting the language objective.			
I worked carefully and checked my work.			
I learned from my mistakes, becoming a stronger mathematician.			
I am confident in the strategies I used and in my solution.			
I am prepared to explain my work to my teacher or a classmate using mathematical and academic language from the lesson.			
My journal entry is neat, clear, and logically organized all the way through.			