

## “THAT’S NOT FAIR” | LESSON PLANS

# Creating Math Interactive Journals *for Elementary Students*

### PURPOSE

Our purpose is to give space to students to mathematize the world around them in ways that they have not had opportunities to do so before.

### OBJECTIVES

1. Creating space and time to explore non-traditional mathematical concepts through writing and drawing.
2. Empowering students to make sense of the world around them while interacting with their peers and all subjects.

### HOW IS THIS INTERACTIVE MATH JOURNAL DIFFERENT?

Traditionally, math journals are places where students can explore one problem or do activities based on what they’re learning and keep it all in one place. What is special about them is that it creates a ground for students and teachers to communicate back and forth if they please. We want to take it one step further and include a space for exploration within these journals that still have to do with math but interact with their personal parts of their lives and other subjects so they can truly see the connections that mathematics has in the world. In this journal, students will be asked to write, draw, solve, and imagine and not within the traditional confines of

mathematics. The interaction element comes from interacting with themselves, the teacher, and their peers.

## OPTIONS

An option here would be to make a general interactive journal that would interact with all subjects and reflections on topics. Anything you want to communicate with your class or have your students think deeper about could be fair game in a general interactive journal. We are focused on math here of course to get kids thinking, writing, and drawing around the subject of mathematics since it is a subject not always accessible to our students.

## GENERAL NOTES

We want to stay away from doing a single math problem in these journals unless it is a story problem and can be used for discussion with open ended questions and answers. Math questions or thought provoking questions are fine but if it is something you would use for a test with a rubric, try to stay away from these types of questions that are more for review or practice.

Vocabulary is always a fun topic for math interactive journals if there is an element of personalization for the students. For example, if their word that week is “balance”, asking them to illustrate what they see as balance or where they have heard it before could be useful instead of giving them a definition in the beginning of a unit and adding on to that daily to make a class definition eventually.

## MATERIALS

- Composition Notebook for each child (or make your own!)
- Printed Prompts for each child

*\*These lessons are assuming there are general norms in your classroom revolving around learning mathematics i.e. taking turns talking, materials management, responsible actions, behavior rewards/responses, etc... The lessons are also labelled by day but they do not have to occur consecutively and can be taught weeks apart as needed. It is also assumed under materials that all students have access to pencils, crayons, and rulers as they need them.*

## LESSON PLANS

<b>LESSON 1 - Setting up our interactive math journals</b>	
<p>Explain to your students that you have a new way you want to communicate with them and it is through something called interactive journals. Tell them that you have been having so much fun doing math with them that you want to dive in it deeper when time permits. Explain how often these journals will be used (once a week to start is great!) and that you want to help set their notebooks up.</p> <ol style="list-style-type: none"> <li>1. After each student gets a notebook, ask them to set up a table of contents and number every other page or every page as you see fit. Draw this out on an anchor chart so that they can refer to it everytime they use this journal.</li> <li>2. Each day will have an overall title referring to the topic that will go in the table of contents and link to the page number.</li> <li>3. The first interactive math journal prompt that can be a good start is asking students to draw their own neighborhood.</li> <li>4. Remind them that when it comes to interactive journaling,             <ol style="list-style-type: none"> <li>1) There are no right or wrong answers and it is their way of seeing what they see and that's the beauty of it.</li> <li>2) If it is a drawing prompt, they can still use writing to explain or label. If it is a writing prompt, they can still use drawings or diagrams within it. Whatever works for them.</li> </ol> </li> </ol> <p>CHECK FOR UNDERSTANDING: When will these journals be used? How will they be used? What are some of the structures within it and the freedom with it?</p> <ol style="list-style-type: none"> <li>5. Give them about 7 minutes of full quiet time. Then, afterwards explain what will happen with these journals and how you and the student will form a secret communication through the journal and that you will ask questions through the journal to each other but as well as with their peers.</li> </ol>	<p>Materials :</p> <ul style="list-style-type: none"> <li>-Notebooks (one for each student)</li> <li>-Anchor Chart</li> <li>-Markers</li> </ul>
<p><i>Post Lesson Teacher Prep:</i> Collect all notebooks, in order to save time and create an intentional lesson, students will not be sharing with each other just yet. During this lesson and the next, you will be in charge of writing a thought provoking question, based in math if you</p>	<p>20-30 minutes</p>

can, that the students would have to think further about (This means that there is no definite answer). Examples of these are in the mock interactive journal.	
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<b>LESSON 2- Responding Intentionally to our Teacher</b>	
<p>Explain to your students that you very much enjoyed looking at their neighborhood maps and that you learned so much about where they live. Tell them that the interactive part of this journal comes in today.</p> <ol style="list-style-type: none"> <li>1. Explain to them that all of them will have a post-it from you in their journals and that it will have a very special mathematical question on it- the type of question that scientists and mathematicians think about.</li> <li>2. After you pass them out, their job is to read the question, spend some time thinking about it, and on the next page, write a response or draw a response (or a combination of both). (They always have an option to do both to fully explain themselves)</li> <li>3. At the top of this page, the topic will be “RE: Neighborhood Maps” since it is a response to the question. This is also the format it will be in in their original table of contents.</li> <li>4. Encourage them to really think about the question to answer in the most logical and mathematical way and what it means to respond “intentionally” with the teacher. <ul style="list-style-type: none"> <li>- Answering the question</li> <li>- Mathematizing the response, or explaining where the math is present</li> <li>- Explaining your response</li> <li>- Illustrating your response</li> </ul> <p style="text-align: center;">CHECK FOR UNDERSTANDING</p> </li> <li>5. Remind them again of the norms that need to be present when writing in their journals (e.g. voice level zero, on task, pencil sharpening norms, ‘what to do when you are stuck’ norms)</li> </ol>	<p>Materials :</p> <ul style="list-style-type: none"> <li>-Notebooks (one for each student)</li> <li>-Anchor Chart</li> <li>-Markers</li> </ul>
<p><i>Post Lesson Teacher Prep:</i> This time, instead of responding to individual writing, look through their journals for common themes, patterns, and mistakes, e.g. students drawing more than writing (this would be more of a noticing, not a judgement as students are free to explore how they want to with their mathematical journals, not answering the question directly, etc...)</p>	<p><i>10 minutes</i></p>

<b>LESSON 3- Peer Galleries and Post-It Norms</b>	
<p>We are claiming this as Day 3 but it is more of the third lesson assuming that students have had a chance to do another interactive journal prompt so they get in the groove of how it can work.</p> <p>This activity can work for any prompt but we are focusing specifically on the idea that a student brought something that meant something to them from home.</p> <ol style="list-style-type: none"> <li>1. Tell students a few days ahead of time and remind them everyday to bring something in from home that means something to them. (If you are worried about size, mention this briefly as it should be something that should fit on their desk.)</li> <li>2. Explain the activity: <ol style="list-style-type: none"> <li>a. "Each of you brought something special today that means something to you. In order for us all to experience what you brought, we are going to be doing something called a peer gallery today. We will be doing more of these, sometimes with items and projects and physical things, and sometimes with our drawing and writing in our journals so everyone can learn from each other."</li> <li>b. "Each of you have three post-its. Your job to walk around and look at each other's items. Once you have a mathematical question about the item, write it down for them."</li> <li>c. MODEL with your own item here. Bring in an item and have the kids come up with mathematical wonderings or noticings or questions about the item so they see the range of questions they are able to ask each other.</li> <li>d. Once all directions are clear and questions are answered you can do the following: "When I say _____, you will each get up with your pencils and post its and walk around the room looking at all the wonderful items. Make sure to find ones that don't have post-it's yet in the beginning so everyone has a chance to think mathematically.</li> </ol> </li> <li>3. A lot of the norms and guidelines mentioned to your students here will be based on classroom norms already present.</li> </ol>	<p>Materials :</p> <ul style="list-style-type: none"> <li>-Notebooks (one for each student)</li> <li>-Anchor Chart</li> <li>-Markers</li> <li>-Post-it's</li> </ul>

<p>4. Option: Students can go around with partners in the beginning to understand how to ask questions and use the post-it's. Just make sure there are norms around sharing at this point.</p> <p>5. Students all come back to their seats and review their questions and turn and talk with their seat partners about them. You can stop there OR ask them to journal about their questions right then and there or next time.</p> <p>This activity can work for physical creations as well as just their normal journal entries (just make sure to tell them before their journal entry if it is going to turn into a peer gallery to keep it fair!)</p>	
<p><i>Post Lesson Teacher Prep:</i> It would be good to still look through these if they are a journal prompt just to stay in sync with your students' ideas.</p>	

<p><b>Lesson 4- Sharing norms</b></p>	
<p>It would be a good idea to talk about what it means to share what you have created in your journal or your expression of ideas to those around you, whether that is in a turn and talk setting OR in front of the whole classroom. Some things to consider:</p> <ol style="list-style-type: none"> <li>1) Students introducing themselves and the topic</li> <li>2) Students repeating the question or topic before the dive in to share</li> <li>3) Students expressing their initial thoughts or process</li> <li>4) Students sharing their creation through explanation</li> <li>5) Students thanking the audience for listening and asking if there are questions.</li> </ol> <p>None of these are an absolute must but good practice for our students for how to share their ideas. Students can then turn and talk what they have learned or journal about it!</p>	<p>Materials :</p> <ul style="list-style-type: none"> <li>-Notebooks (one for each student)</li> <li>-Anchor Chart</li> <li>-Markers</li> </ul>

*What's absolutely wonderful about interactive journals is that there is actually not much prep required: If you know the kind of prompts you want to use or the*

*vocabulary that you want to emphasize within your math lessons, that is enough to get you started and students truly discussing!*

*A lesson that was not brought up in the lesson plans was to respond to discussion questions while voicing their opinion- this is not only a standard in elementary school but it would be so wonderful to do it within the realms of mathematics!*

## **BEGINNING IDEAS FOR INTERACTIVE JOURNALS**

### **Math Based Drawing Activities:**

Map of my Neighborhood

Dream Classroom Set-Up

My Home's Blueprint

Draw a plant with a pattern element to it

### **Number talks:**

quick images and choral counts (In this case, they would be reflecting or responding to the original quick image in their journals as opposed to outloud.)

### **Other:**

Bring in an item from home that means something to you

### **Specific:**

Post Discussion Reflections

What is equality and equity prompts? (or any other vocabulary) based on standards....

Are two consecutive numbers added together going to be odd or even?

What is a pattern you saw recently?

Pick an issue from the list below and explain how you could use math to investigate the problem:

Many people believe women do not know math as well as men....

How would you solve the problem of....

What do you think the relationship between math and real world problems are?

### **Art Based Mathematical Prompts:**

Creating a Snowflake

Scrap Art (Use with any math standard, just scraps of construction paper. E.g. "use the scraps to show what a half of a whole looks like")

Making a Paper Airplane, and then drawing it out and labeling the aero-dynamic elements

How could you make a cube using a piece of paper? How many sides and corners would it need? *Group work!*