

**Los Angeles Unified School District
Division of Instruction
Secondary Mathematics Branch**

Opening Strong in a Common Core Classroom

Transitions: As we transition away from the California Standards to the Common Core State Standards, we would like to suggest spending a few days at the beginning of the school year building community, establishing norms and procedures, and introducing students to the grade level focus areas and the math practices. This is a fairly generic outline that can be used in any secondary classroom. It can be followed as is, or teachers can substitute their own activities and structures.

Objectives:

- **Build Community and a Safe Environment**
- **Establish Classroom Norms and Procedure for working as a group**
- **Teach the Language guidelines, Protocols and Expectations**
- **Set up Classroom Expectations for the use of technology and other tools, such as calculators**
- **Set up Guidelines for what it means to exemplify the Math Practices 1, 3 and 4**

The first 10 days of school will be used to establish clear norms, behaviors, protocols, and structures for success.

I. Build Community

Use a getting to know you activity such as *Number Lines of My Life*, or *Numbers Significant in my Life Poster or Collage*. Introduce a cooperative learning strategy that you will be using in your class on a regular basis to structure the sharing of information. In our example we are using *Think Ink Pair Share*.

II. Introduce the CCSS Focus Areas for your Grade Level, and Introduce the Math Practices.

1) Provide an overview of the grade level content standards focus areas and of all 8 math practices. Using the math practices posters in student friendly language, (See Jordan school District 2011, Grade 6) analyze math practices 1, 3, and 4 more deeply.

2) Have students do a self-assessment of their abilities and habits in relation to MP 1, 3, and 4.

3) Have students use the completed self-assessment to set goals for the year.

Use a 3-2-1 and Think Ink Pair Share. Looking at their math practices self-assessment, ask students to list 3 strengths, 2 weaknesses, and 1 improvement goal. With a face partner take turns sharing each category (model taking turns)

4) On a regular basis, re-visit the self assessment and the goals (perhaps every 5 week marking period)

III Establish Classroom Norms and Procedures,

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Introduce Jo Boaler's 7 Positive Norms for a math class over several days. Use the resources provided in her document to illustrate each norm. After the norms have been established, make sure you continue to reinforce them, refer to them, and continue to illustrate them.

Start working on a Problem of the Day (We are suggesting the Four 4s). It serves multiple purposes. First, it allows students to start implementing math practices 1 and 3. Second, it gives teachers some information about individual abilities in arithmetic and order of operations. Third, it allows the teacher to continue to establish classroom procedures and set norms for working in groups and for classroom discussion. You can introduce the Kate Kinsella language frames at this time. Fourth, it can allow for the introduction of technology.

IV Set up Classroom Expectations and procedures for the use of technology and other tools.

Appropriate use of technology/manipulative – calculators

- a. Setting up the norms to retrieve/return/distribute the materials in the classroom
- b. Activity to introduce students to basic functions of calculators (exponent - on the simple calculator or scientific- square roots, how to enter a negative numbers, decimals, error sign by taking a square root of a negative number...)

Compare the answer when done without the calculator and answer after entering in the calculator.

The calculator can be used as a tool to help students verify solutions to the four 4s and to help students find solutions that they were unable to find. See if incorporating calculator use can help them progress further.

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OPENING STRONG ACTIVITIES

I. BUILD COMMUNITY

Use a getting to know you activity such as *All About Me Number Line*, or *Numbers Significant in my Life Poster or Collage*. Introduce a cooperative learning strategy that you will be using in your class on a regular basis to structure the sharing of information. In our example we are using *Think Ink Pair Share*.

Introduce Think Ink Pair Share (TIPS) strategy. This is a strategy we will use in our class a lot this year

We have done the **Think and Ink** (making the timeline / poster)

Now we are going to **pair up** with a shoulder partner and take turns introducing ourselves and explain our timeline/poster. (Explain shoulder partners = people on either side of you.) Have them decided who will be A or B and tell them who goes first.

When it's your turn to talk, don't just read your timeline or poster to your partner, provide some details by saying at least 2 or 3 sentences about each number (setting the stage for MP3). For example on my timeline, when I talked about moving to the US at the age of 13, I talked about which school I attended, and what it was like moving to a new school in the middle of the school year.

Being a good listener is going to be very important in this class. When it's your turn to listen, pay close attention, because you are going to have to introduce your partner to the class. (**Model good listening** – eye contact, clearing your mind so that you can pay attention to your partner, asking clarifying questions if you don't understand, paraphrasing what you heard)

Note: Building a classroom community and effective small teams is a process that takes time and constant effort. Spencer Kagan, author of *Kagan Cooperative Learning*, suggests you do class-building activities, (getting to know you activities that involve the whole class) once a week, and teambuilding activities (getting to know you activities that involve partners or table groups) two times a week.

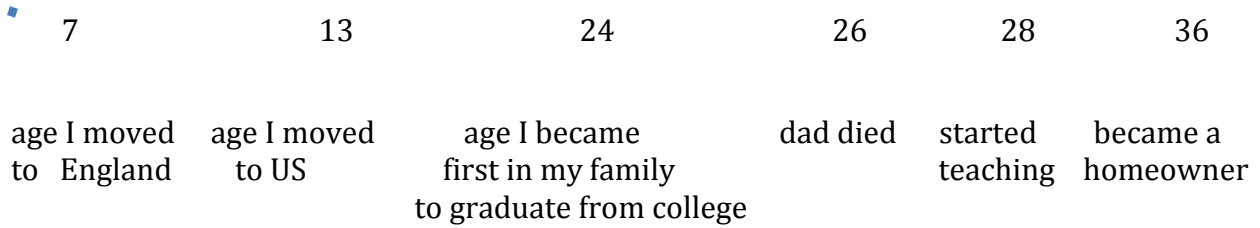
Resources included: Placemat, All About Me Number Line

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1) All About Me Number Line

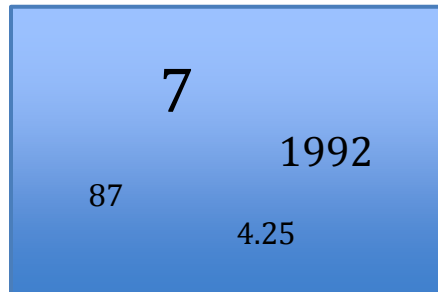
Introduce the task – make a timeline of your life, or make a poster of some important numbers in your life. **Model the task** by making a timeline /poster of your life. Say 2-3 sentences about each number. This is a chance for you to share a little about yourself.

Example of timeline



2) Numbers Significant in my Life Poster or Collage

Example of some important/interesting numbers in my life (imagine them in various sizes on an 8.5 x 11 piece of paper)



4.25 – my hourly wage when I worked at the Olympic Village selling ice cream

87 – my lowest score on the golf course (way too long ago)

1992 – the year I started teaching (talk a little about why)

7 – In 7th grade I moved to the US and when I was 7 I moved to England

Give students time to individually create their own timeline or poster. Set a time limit.

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II. INTRODUCE THE CCSS FOCUS AREAS FOR YOUR GRADE LEVEL, AND INTRODUCE THE MATH PRACTICES.

1) Provide an overview of the grade level content standards focus areas and of all 8 math practices. Using the math practices posters in student friendly language, (See Jordan school District 2011, Grade 6) analyze math practices 1, 3, and 4 more deeply.

2) Have students do a self-assessment of their abilities and habits in relation to MP 1, 3, and 4.

Math Practices 1, 3, 4 Self Assessment Form

| MP1 | Rarely | Sometimes | Most of the time |
|---|--------|-----------|------------------|
| When presented with a problem, I can make a plan, carry out my plan, and evaluate its success. | | | |
| I read the problem carefully. | | | |
| I understand the question and predict a solution. | | | |
| I choose a solution path. | | | |
| I try my path and make changes if needed. | | | |
| I don't give up trying to solve the problem. If I get really stuck, I seek help from the textbook or from other people. | | | |
| I check my answer and make sure my solution is reasonable. | | | |
| MP3 | | | |
| I can explain my math thinking and talk about it with others. | | | |
| I explain and justify my thinking using words, objects, and drawings. | | | |
| I listen to other ideas and decide if they make sense. | | | |
| I ask useful questions. | | | |
| MP4 | | | |
| I can recognize math in everyday life and use math I know to solve everyday problems. | | | |
| I use math to represent problems in my world. | | | |
| I explain math situations using objects, drawings, symbols, equations, and words. | | | |

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| | | | |
|--|--|--|--|
| I make connections between representations. | | | |
| I check my answer and improve the model as needed. | | | |

- 3) Have students use the completed self-assessment to set goals for the year.**
Use a 3-2-1 and Think Ink Pair Share. Looking at their math practices self-assessment, ask students to list 3 strengths, 2 weaknesses, and 1 improvement goal. With a face partner take turns sharing each category (model taking turns)

| |
|--|
| 3 strengths |
| 2 weaknesses s |
| <p>1 goal for improvement</p> <p>By __(date)__, I will improve in ___(area of improvement)___ by (method of improvement)___.</p> <p>I will measure the improvement by __(method of showing improvement)___.</p> |

On a regular basis, re-visit the self assessment and the goals (perhaps every 5 week marking period)

Resources Included: MP Assessment, Math-Practices poster v1, Math-Practices poster v2

III ESTABLISH CLASSROOM NORMS AND PROCEDURES

Use Jo Boaler's Setting up Positive Norms in Math Class.

<http://www.youcubed.org/wp-content/uploads/Positive-Classroom-Norms2.pdf>

Introduce the norms over time, and use the resources provided to illustrate the norm. Once norms are established, it is important to continue to revisit and reinforce the norms throughout the year.

Four Fours Challenge

This next activity is doing a Problem of the Day (We are suggesting the Four 4s) and it serves multiple purposes. First, it allows students to start implementing math practices 1 and 3. Second, it gives teachers some information about individual abilities in arithmetic

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and order of operations. Third, it allows the teacher to continue to establish classroom procedures and set norms for working in groups and for classroom discussion. You can introduce the Kate Kinsella language frames at this time. Fourth, it can allow for the introduction of technology.

The class is challenged to make as many numbers as they can using exactly four 4s, mathematical operations, and grouping symbols. For example, $4 \times 4 + 4 + 4 = 24$, $44 + 4/4 = 45$, $4 - 4 + 4 - 4 = 0$. Depending on the grade level, the teacher will need to determine what operations are allowed (e.g. powers, square roots, factorials). This activity may extend over several days or weeks, as students gradually build up a wall chart showing how to do many numbers (e.g. all up to 100 and some beyond). Students can add contributions daily, to be checked or challenged by classmates. Alternative solutions can also be recorded.

1. Divide the class into groups and do a teambuilding activity so the students get to know their teammates. Discuss expectations for group work: E.g. Listening to each other, valuing the ideas of others, asking clarifying questions if you don't understand. Discuss appropriate and inappropriate ways of helping. Giving your paper to your partner to copy is inappropriate because.... An appropriate way to help is.... Emphasize that everyone participates and **everyone is responsible for** understanding and knowing how to solve **everything**. Introduce the Kate Kinsella Language Frames. For this particular problem, the frames for agreeing/disagreeing would be very appropriate.
2. Introduce the Four 4s problem and illustrate with a simple case, such as $4 + 4 + 4 + 4 = 16$. Ask for other suggestions from the class and record these in words (if necessary) and symbols. Do some examples with the grouping symbols and other operations. Some solutions will need brackets inside brackets. This may need to be discussed with the class.
3. Challenge the class to see which of the numbers from 1 to 100 they can make. (You don't have to do 1 to 100, you can pick any range of numbers.) If you are having groups make a poster, you may want to reinforce the message of individual accountability by giving each group member a different color pen.
4. Many interesting questions will arise that will extend students' knowledge of numbers and operations. For example, students who write $4 - 4 - 4 + 4$ may wonder whether this is equal to zero (it is) because they need to go into negative numbers to work it out.
5. Add selected solutions to the wall chart. As students add solutions, ask classmates to verify that the solution is correct. (MP3) Setting the tone for class discussions is important, and setting the tone for handling mistakes is important. Mistakes are opportunities for learning and it is important that students don't get discouraged

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and publicly humiliated by a mistake. If classmates suspect that a solution is incorrect, have them use the Kate Kinsella disagreeing language frames to challenge a solution. Finish the lesson with a progress report from the groups and set them the challenge of seeing how many other numbers can be done.

6. Classroom discussion: conduct this session when good progress has been made on completing the four fours chart, e.g. when most of the numbers from 1 to 100 have been completed. Select examples from the chart to illustrate the following points:

The order of operations matters e.g. working out $4 \times 4 - 4 \div 4$ you can get many answers:

$$((4 \times 4) - 4) \div 4 = 3$$

$$4 \times 4 - 4 \div 4 = 15$$

$$4 \times (4 - 4 \div 4) = 12$$

$$4 \times (4 - 4) \div 4 = 0$$

-People need to be able to communicate exactly what calculations they intend to be done. This is done by agreed rules (conventions) and by using brackets.

Resources Included: Four Fours Activity, 4 4s calculator activity, Kinsella Frames, Jo Boaler's Setting Up Positive Classroom Norms.

IV. SET UP CLASSROOM EXPECTATIONS AND PROCEDURES FOR THE USE OF TECHNOLOGY AND OTHER TOOLS.

Appropriate use of technology/manipulative – calculators

- a. Setting up the norms to retrieve/return/distribute the materials in the classroom
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