SCAFFOLDING TASK: It's Time, Part I: Using a Number Line

Approximately 3-4 days

STANDARDS FOR MATHEMATICAL CONTENT

MCC1.MD.3 Tell and write time in hours and half-hours using analog and digital clocks.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND INFORMATION

Another variation on teaching students how to tell time on the clock is by using the number line. The number line is a useful way to help students understand the movement of the hands of the clock. Also, connecting the number line and the clock is helpful in developing student's number sense.

It is important to note that *am* and *pm* are discussed within this task. It is not part of the first grade standards for students to master this concept and they are not officially introduced to the concept of am and pm until 2nd grade. However, some discussion of *am* and *pm* is needed to build student understanding of the concept of time.

ESSENTIAL QUESTIONS

- What does the hour hand on a clock tell us?
- Why do we need to be able to tell time?

MATERIALS

- *It's Time: Part I* task sheet
- 12 sheets of cardstock or construction paper
- Brass fasteners (13)
- Markers
- 1 ruler
- Masking tape
- 1 piece of construction paper, cut into a triangle to tape to the tip of the ruler.

GROUPING

Whole Group/Individual

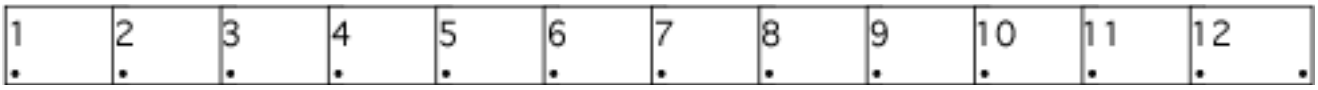
TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I
Gather students in a common area and discuss prior knowledge of a number line. Ask, "Do you know of any connections between a number line and telling time?" Introduce the important term, "Clockwise" and allow students to see the connection between the term and the direction of the moving hands on a clock.

Lead students in a discussion about am and pm. Encourage students to make the connection of each by explaining that the hands on a clock travel completely around the clock, twice, to make a full day (24 hours). The am hours represent one trip around the clock and the pm hours represent the second trip around the clock. Lead students to brainstorm activities that occur during these time periods by asking questions such as, "What are you doing at 3 am?" "What might your family be doing at 5 pm?"

Prepare to create two clocks by assigning each student an hour of the day and have the student illustrate an appropriate activity that might occur during that hour. If you have less than 24 students, you may need to assign some students more than one hour.

Part II
Once the illustrations are complete for each hour, ask the students to lay their hours in order. Ask them to take their illustration to the floor and place them, as a group, in an order that makes sense to them. The teacher should not influence where the students place their hours. More than likely, they will place their hours with like numbers. If this occurs, use this scenario to show the separation of am and pm. Ask the students to make a number line, using their illustrations. Discuss with the students that even though they are individual hours, they are all connected and complete a full rotation around a clock. Tell them that they are going to make two number lines to represent the hour hand traveling twice around the clock to complete a full day. Punch the lower left hand corner of each sheet and connect the hours with brass fasteners as you have this discussion.



As students are working together to create a number line that reflects hours in a day, listen to the conversations they have with each other. There may be some students who insist that the numeral 1 come first on the number line and others who insist that the 12 comes first. How are they able to justify their reasoning? The students may request that you help them settle the mathematical dispute, but try to encourage them to share what they know to teach each other. If this situation occurs, use questioning to help them explain their rationale for placing the 1 or 12 at the start of the number line.

Suggested questions include:

- *What do you know about the hours in a day that help you determine what number should go first?*
- *What do you know about a number line that helps you decide what number should go first or last?*
- *What experiences with time have helped you with this task?*

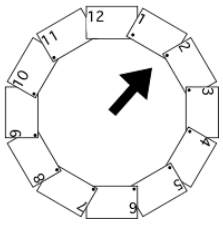
Once students are satisfied with the number lines they have created, allow each group to share their number line and explain to the other group how they determined the placement of each hour. Discuss the differences in each, if there are any, and clear up any misconceptions. Lead a class discussion using the following suggested questions:

- *Does this number line remind you of anything?*
- *Where should 12 be in this progression of numbers?*
- *What number comes after twelve on a number line?*
- *What number comes before one??*
- *What if I take these cards and rearrange them, and instead of putting them in a line, put them in a circle? What would this look like?*
- *Does this number line remind you of anything we have in our room or that you have seen on the wall?*

Once both groups have had the opportunity to share and you have lead a meaningful discussion of the number line as it relates to time, allow students to write in the math journal about their experience. Have them answer the following questions and allow them to share after they have all had time to reflect on the task:

- *Are there any differences between a traditional number line and a number line that represents time? If so, what are they?*
- *What is something new you learned today that you did not know before? Anything that surprised you?*
- *Is there anything that is unclear to you or that you would like more practice with?*

Next, connect and fasten the 12th and the 1st hour by arranging the cards in a circle. Connect a triangle to the tip of the ruler using masking tape. Explain to students that this will represent the hour hand for the clock.



Part III

Using the large class made clocks, give students several practice opportunities to make time. Line half of the class up at each clock. Explain to students that one student at a time, from each group, will

make time to the hour on the clock. (Ex. Heather is standing in line at one clock and Natisha is standing in line at the other clock. The teacher calls out "4:00". Each student makes the time on the clock using the hour hand. All students check to see if they are correct by showing thumbs up if they agree with the time made, or thumbs down if they disagree.). Continue giving practice opportunities until it seems that all students have developed proficiency making time to the hour.

Part IV
Once student demonstrate proficiency making time on a clock to the hour, call out an activity and allow students to determine the approximate time it would occur. Students should show the time on student geared clocks (Judy clocks or similar clocks). Have the students show the time on their clock. Call on students to justify their answers. Suggestions:

- Eat dinner
- Get dressed for school
- Attend baseball practice
- Sleep
- Dream
- Take a bath
- Read a book
- Have recess
- Eat lunch
- Write a story

Part V
Have students return to their seat to create a number line of their own, using time to the hour. Give each student the *It's Time Part I* task sheet and have them demonstrate their understanding of time as linear measurement and their ability to identify time to the hour on an analog and digital clock. Students will choose 5 things they love to do throughout the day and write the time on the analog clock and digital clock along with a short description of the event. They will then cut out each strip and glue them in order to create a number line. Allow students to share these with the whole group once all students have sequenced the events of their choosing.

FORMATIVE ASSESSMENT QUESTIONS

- How are a clock and a number line related?
- What differences are there in a regular number line and one that measures time?
- What types of activities would occur during the am hours? The pm hours?

DIFFERENTIATION

Extension
- Make several cards that have time to the hour in the form of an analog clock and a digital clock. On a long sheet of construction paper, draw an empty number line. Have students

place the cards correctly on the number line to reflect time. You could also include a short task sheet that requires them to answer questions about their number line, such as: *What hour comes before _____ ? After _____? "I started with ____ o'clock because I know that…"* Or have students write questions of their own for other students to answer.

Intervention

- Help the student create a "My Day Timeline" whereby s/he lists the events of his or her day, hour by hour, to attach meaning to the concept of time.