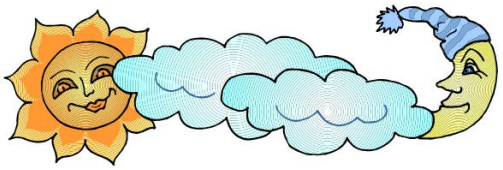
CONSTRUCTING TASK: HOW DO I SPEND MY DAY



APPROXIMATE TIME: *5 Days*

STANDARDS FOR MATHEMATICAL CONTENT

MCC. 3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

MCC.3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.

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 KNOWLEDGE

Students spend a week collecting data about how they spend their day. They use the data collected to create a graph of how they spend their time and to answer the question, "Do you spend too much time watching television?"

**** Please Note: This task will require a week of gathering data.****
This task can be introduced by asking students the following questions (Record responses on the board or chart paper):

- What do you do during the day?
- What is your favorite TV show? How long does it last? How many times a week do you watch it?

It is important to understand student interests before beginning this task. A different question may be more appropriate for different groups of students.

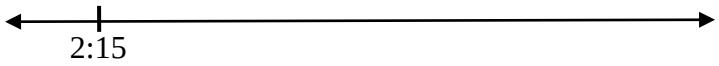
The book *Lemonade for Sale*, by Stuart J. Murphy, or a similar book about using bar graphs to display data would be appropriate to use with this task. The characters in the book keep track of the number of cups of lemonade sold, using tallies and make a bar graph to show how much they've sold.

Students should have had opportunities to create and interpret data from bar graphs. Additionally, students should have had opportunities to work with telling time and working with elapsed time.

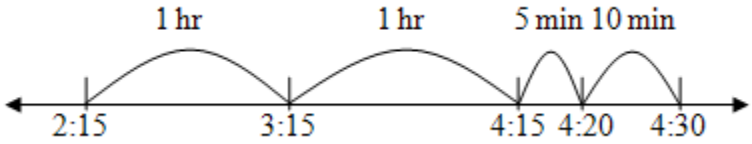
As elapsed time calculations are made, you may want to encourage students to explore a linear model of time as well as a traditional analog clock. The linear model can be created using an open number line. Jumps are made from the beginning time to the ending time much like movement on a number line and increments of time may be recorded above the jumps. An example is shown below:

To find the elapsed time from 2:15 pm to 4:30 pm, start with an open number line:

Add the starting time:



Then count up to the ending time using jumps that make sense to the students:



Because students can record their time to the nearest quarter hour, student should use start and finish times to the nearest quarter hour as shown in the example above. The exact start time may have been 2:21, which is closest to 2:15.

ESSENTIAL QUESTIONS

- How can we determine the amount of time that passes between two events?
- How can you prove to your parents you do not spend too much time watching television?
- How can you use graphs to answer a question?

MATERIALS

- "How Do I Spend My Day?" students recording sheet
- Paper, markers, crayons, rulers, and other supplies needed to create graphs

GROUPING

Individual/Partner Task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I

To begin this task, discuss possible activities with students – homework, school, eating, watching TV, reading, sports, sleeping, etc. Provide each student with a copy of the template and go through the example of how to complete the chart. Students should record ALL of their possible activities on the blank lines at this time. For the next 5 school days, students should record the time spent on each activity.

- Students should record the time they spend on each activity. This does not have to be an exact time, to the nearest quarter hour is sufficient.
- Check charts daily to ensure that students are keeping up with their data.

Once students have completed data collection, they can begin creating displays for their data.

- Discuss how to display the data. What information will your parents need to be convinced you do not spend too much time watching television? One way to display their data is to find the total number of hours spent on each activity for the week and graph these results.

Part II

Students will follow the directions below from the "How Do I Spend My Day?" student recording sheet.

Your parents claim you are spending too much time watching television during the week. You need to show your parents exactly how little of your time is spent watching television.

Keep track of what you do during a normal school week, graph the results, and show your parents how you spend your time.

On a separate piece of paper, use the data you collected to display your data and to answer the following questions:

- How much time do you spend on each of your activities?
- Do you spend too much time watching television? How do you know?

Part III

Daily Activities (Cross out any activity below you do not do.)	*Length of Activity (Number of Hours)*						
	Example	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Total Time for Activity*
Sleeping	9						
School (including travel)	8						
Eating	$1\frac{1}{2}$						
Homework	$\frac{1}{2}$						
Reading	1						
Sports/Playing	$1\frac{1}{2}$						
Watching TV	2						
Taking Care of Me	$\frac{1}{2}$						
TOTAL TIME (for each day)	24						

*Amount of time should be recorded to the closest $\frac{1}{4}$ hour.

After completing your table, complete the following.

1. Use the data above to create a bar graph display of the data.
2. Use the data and your graph to decide whether or not you spend too much time watching television.
3. Write a paragraph explaining how the data informed your decision.

FORMATIVE ASSESSMENT QUESTIONS

- What activities do you typically participate in each week?
- How many minutes in a quarter hour? Half hour? (Students may want to work with minutes rather than fractions of an hour.)
- What data is important to display in your graph? Why?
- Do you spend too much time watching television? How do you know? What is "too much"?
- What parts of a graph need to be included?
- What increments will you use to label the scale of your graph? (Typically the scale would be along the vertical axis, but a bar graph can be horizontal or vertical, so don't limit students to labeling the vertical axis with a scale and the horizontal axis with categories.)
- What categories will you display on your graph? Why did you choose those categories?

DIFFERENTIATION

Extension

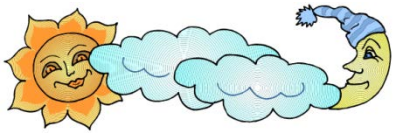
- Ask students to describe how the data could be used to convince parents to allow the student to add an activity to or remove an activity from their weekly schedule. Would this require a new graph? How would it need to be different?

Intervention

- Support students in the use of student clocks and/or open number lines to determine elapsed time.
- Allow students to use one of the web-based applications in the "Technology Connection" section below to create a bar graph.

TECHNOLOGY CONNECTION

- *http://illuminations.nctm.org/ActivityDetail.aspx?ID=63* – Students can use this website to enter their data and create a bar graph.
- http://www.shodor.org/interactivate/activities/BarGraph/ – different link to the same program as above.



Name _____ Date _____

How Do I Spend My Day?

Your parents claim you are spending too much time watching television during the week. You need to show your parents exactly how little of your time is spent watching television. Keep track of what you do during a normal school week, graph the results, and show your parents how you spend your time.

On a separate piece of paper use the data you collected to display your data and to answer the following questions:

- How much time do you spend on each of your activities?
- Do you spend too much time watching television? How do you know?

Daily Activities (Cross out any activity you do not do.)	***Length of Activity*** (Number of Hours)						
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TOTAL TIME *(for each day)*	24						

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After completing your table, complete the following.

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